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THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

THE SIXTEENTH ANNUAL MEETING OF THE PACIFIC DIVISION

By Dr. J. MURRAY LUCK, Secretary

THE sixteenth annual meeting of the Pacific Division of the American Association for the Advancement of Science and Associated Societies was held from June 15 to 18, in Pullman, Washington, where the division was entertained by the State College of Washington. Though far from the larger centers of population in the West, the meeting was exceptionally well attended and of high quality throughout. Of the total registration of 510, 200 were from outside of Washington and Idaho.

The State College of Washington is situated but ten or twelve miles distant from its sister institution in Moscow—the University of Idaho—which warmly cooperated in various matters pertaining to the meeting. Both institutions serve the rich agricultural section commonly known as the "Inland Empire," an area of great fertility interrupted by regions of marked geological and scenic interest.

The sessions commenced on the afternoon of June 15 with reviews of the scientific contributions of the past year. The purpose of these surveys, now adopted as a recognized part of the divisional program, is to describe the scientific researches in progress in the universities of the West, in the light of their relationship to the engrossing problems of current interest within the sciences at large.

The preparation of such reviews and their presentation within the restricted time available is admittedly a difficult task, requiring a speaker to confine his attention to but two or three of the problems of major interest, or to enumerate without critical evaluation most of the investigations proceeding in the different

institutions. The former has come to be regarded as the preferred method. Dr. J. S. Plaskett's review on astronomy and astrophysics was read by Dr. F. J. Neubauer, of the Lick Observatory, while that pertaining to the animal sciences, prepared by Professor J. E. Guberlet, of the University of Washington, was read by Professor Melville Hatch. Surveys of the current research in chemistry, physics and the plant sciences were presented by Professor J. B. Ramsey, of the University of California at Los Angeles, Professor W. V. Houston, of the California Institute of Technology, and Professor G. J. Peirce, of Stanford University, respectively.

Later in the afternoon, through the courtesy of the General Electric Company, two excellent sound films were presented—one by Dr. I. Langmuir, "Oil Films on Water," and the other by Lord Rutherford, "Constitution and Transformation of the Elements." About 350 attended these opening sessions.

In the evening, Professor A. O. Leuschner, of the University of California, presented his retiring address as president of the Pacific Division on "The Astronomical Romance of Pluto." Prior to President Leuschner's address, Dr. E. O. Holland, president of the State College of Washington, formally welcomed the association and its guests to the college, to which Professor E. G. Martin, vice-president of the Pacific Division, gave reply.

The morning of Thursday, June 16, was devoted to a symposium on "Scientific Problems of the Columbia Plateau," in which most of the societies participating in the Pullman meeting joined.[1]

Professor F. L. Pickett, head of the department of botany, State College of Washington, gave an illustrated address on "Interesting Botanical Areas." Going outside the limits of the Columbia Plateau, he gave a brief account of the widely different conditions affecting plant growth in the state of Washington and contiguous territory, and called attention to the opportunities for investigation in the fields of systematic botany, plant physiology and plant ecology. Of special interest are the great areas of humid plains, semi-desert and mountains, in which very little collecting has been done, and the easily accessible regions where xerophytic forms may be studied under natural conditions. "Geological Problems" was the subject discussed by M. G. Hoffman, assistant professor of petrology, State College of Washington. Using lantern slides as illustrative material, the speaker left in the minds of his hearers clear-cut impressions of the principal geological features of the Columbia Plateau. Avoiding discussion of controversial points, he indicated the nature of problems now under investigation. E. F. Dummeier, professor of economics, State College of Washington, spoke on "Economic and Agricultural Problems of the Wheat and Apple Industries." These problems were classified under four heads: (1) "Reduction of Costs of Production"; (2) "Reduction of Costs of Marketing"; (3) "Enlargement of Markets and Freeing Them from Present Restrictions"; (4) "Removal of Restrictions with Freedom of Production of the Commodities Purchased by the Farmer."

Wheat and apples provide two thirds of the cash income from crops of the state of Washington. One half of the wheat and one fifth of the apples are exported to foreign nations. The development of high-yielding and smut-resisting varieties of wheat and improved types of machinery have lowered costs of production. Apple yields in this region are far higher than in any other part of the nation: nevertheless, present prices are below average production costs. Foreign markets have been restricted by tariffs, quotas, licenses and regulation of the sale of exchange. For the most part foreign tariffs are high; in many cases imports are prohibited. These restrictions work a great hardship on a region such as this which, under the principle of comparative advantage, is much better adapted to the production of these crops than of others. "Engineering Problems" was the topic presented by Professor Ivan C. Crawford, dean of the college of engineering, University of Idaho. The outstanding engineering problems of the Columbia Plateau are those of power development and irrigation. To bring the per acre cost of irrigation development within a reasonable figure, power must be sold at a rate which will amortize the cost of its own development and in addition pay a larger proportion of the cost of constructing irrigation projects. The sums involved are so immense, said Dean Crawford, that only the Federal Government can furnish the necessary financial aid. It is proposed that the Government develop the power and distribute it at wholesale rates to private utilities and municipalities. Estimates indicate that the power and irrigation development of the Columbia Basin should pay out in fifty years.

From 4 to 6 P. M., Dr. E. O. Holland, president of the State College of Washington, received the members and guests of the Pacific Division and associated societies. In the evening, Professor J Harlen Bretz, of the University of Chicago, presented an address before the division at large on "The Scablands of the Columbia Plateau in Washington." The principal geological features of the area were discussed and suitably illustrated by the use of numerous lantern slides. The evidence pertaining to the author's theory of a catastrophic flood was ably outlined. To provide an opportunity for further discussion of the theory

[1] Professor C. C. Todd kindly prepared the report on the symposium.

a special session was held on Friday morning under the auspices of the Western Society of Naturalists, at which various hypotheses were critically considered.

The concluding evening address, on "Historic Approaches to Nature," was presented on Friday, June 17, by Dorothea W. Singer, of the University of London:

> Science is a unifier of mankind, independent of race, creed or nationality, for it deals with judgments to which universal assent can be obtained from all those equipped with adequate knowledge and intelligence. Yet it would be a mistake to regard science as a static body of knowledge, fixed and unchangeable. Its true nature is rather indicated by the adjective *scientific, science-making,* since all scientific knowledge must be progressive knowledge. Its third characteristic is accuracy to within a known limit. Finally, the subject-matter of science is usually limited to the world of nature, that is to say, the physical world around us rather than the world as modified by mankind.
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> While earlier civilizations show some scientific knowledge, the religion of science, faith in an ordered universe, was the achievement of the Greek culture. Yet Greek science was hampered by too close an alliance with cosmic speculation and philosophy. The rise of modern science, on the other hand, has been associated with concentration on limited problems. This has led to specialization, which has brought its own pitfalls.
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> As general education becomes more scientific, it may be hoped that the literary man will be illumined by the scientific view-point, while the man of science will find himself by association with the humanistic and esthetic approach to phenomena. Enlightenment from both disciplines should thus reach the "man in the street."
>
> Modern science has a better chance of preservation for posterity than had Greek science, because in modern scientific expositions, unlike those of the Greeks, not merely the results but also the method of attainment of scientific knowledge is set forth.

Nine excursions to adjacent areas of scientific interest were made during the latter part of the week. The most popular were the trips to Bald Butte, Lewiston and the scablands. Bald Butte is an outlying stock of Idaho batholith situated about nine miles southeast of Pullman. It is an inlier of Jurassic age, surrounded by Columbia lavas, which are in turn overlaid by the Palouse loess. From its peak a splendid unobstructed view of the surrounding country could be obtained.

The tour of the scablands was conducted by Professor Bretz, who since 1922 has made this area the subject of intensive study. The trip extended over two days—ending at the great bar on the south side of the Snake River, near Lyon's Ferry, which some regard as impressive and almost irrefutable evidence of an unusual flood. On Friday afternoon, many availed themselves of the opportunity to visit Lewiston and the State University of Idaho, situated at Moscow.

Business sessions of the Pacific Division, A.A.A.S., the executive committee and the affiliation committee were held. At the general business session on June 16, Dr. E. P. Meinecke, of San Francisco, was elected to the executive committee in succession to Mr. Bernard Benfield, who retired after many years of service. A resolution of gratitude for the warm hospitality of the State College of Washington was unanimously adopted. Announcement was made that the 1933 meeting would be held in Salt Lake City under the auspices of the University of Utah. It was agreed that the time of the meeting should be fixed with reference to the Chicago meeting of the American Association (June 19–30) so that members attending the Salt Lake City meeting would be able, if they so desired, to proceed to Chicago for the meetings there. At the meeting of the executive committee on June 17, Dr. W. F. Durand, professor of mechanical engineering, emeritus, of Stanford University, was elected to the presidency of the division for the ensuing year.

Professor W. E. Bradt, Professor P. A. Anderson, Dr. H. E. Culver, Dean Florence Harrison, Helen G. Smith, Professor F. D. Heald and Dean C. C. Todd served as chairmen of the committees in charge of the local arrangements.

The reports of the scientific sessions of participating societies follow:

American Association of Cereal Chemists, Pacific Northwest Section

(Report by J. L. St. John)

The fourth annual meeting was opened with an address by the president, W. O. Whitcomb, of the University of Montana. A feature of the Friday morning session was a question-discussion meeting at which a variety of topics of importance to cereal chemists was considered.

In addition to many interesting papers presented by its members, the section was fortunate in having a number of papers from Eastern authorities on cereal chemistry. Dr. D. A. Coleman, of the U. S. Department of Agriculture, submitted a paper on "Recent Developments in Electric Moisture Determination Devices." Dr. E. B. Working, of Kansas State College, submitted a paper on a "New Dough Mixer." Dr. C. H. Bailey, University of Minnesota, recent recipient of the T. B. Osborne medal for distinguished contributions to cereal chemistry, attended the sessions and presented a paper on "An Automatic Method for Measuring the Expansion of Doughs." On Thursday evening the section attended the general chemistry banquet, and on Friday evening

held a cereal chemists' banquet, attended by about 25. Friday afternoon a visit was made to the campus of the University of Idaho at Moscow. Following an inspection of the campus and laboratories, a lecture, entitled "Bread and Water," by Dr. Bailey, was enjoyed.

The sessions closed on Saturday noon with an election of officers. John W. Clulow, of Portland, was elected president, O. W. Walker, of The Dalles, Oregon, vice-president, and E. P. Walker, of Portland, secretary-treasurer. The meeting next year will be held in Portland.

AMERICAN CHEMICAL SOCIETY, PACIFIC INTERSECTIONAL DIVISION

(Report by J. L. St. John, Chairman of Program Committee)

The fifth annual meeting of the Pacific Intersectional Division of the American Chemical Society was held on June 16 and 17, at the State College of Washington, in conjunction with the sixteenth annual meeting of the Pacific Division of the American Association for the Advancement of Science. The sections participating were California, Montana, Northwestern Utah, Oregon, Puget Sound, Sacramento, Southern California and the Washington-Idaho Border.

At the opening general session three papers were presented. The first paper, on "A Study of the Reversibility of the Hydrogen Electrode," was by H. V. Tartar and S. P. Todd, of the University of Washton. The second paper discussed "The Conversion of Fatty and Waxy Substances into Petroleum," and was presented by W. Seyer, of the University of British Columbia; while the third, "The Universal Occurrence in Living Matter of an Acid Substance which Stimulates Yeast Growth," was by Roger J. Williams, Carl M. Lyman, George H. Goodyear and John U. Truesdail, of the University of Oregon.

The general session was followed by a meeting of two groups, one composed of those interested in general, physical, analytical and industrial chemistry, while the second group included those interested in organic and biochemistry. The following program was presented before these groups:

GROUP I

Phase rule study of mixed derivatives of alcohols: W. E. CALDWELL and K. R. MACLEAN, Oregon State College.

Studies in absorption: W. L. BEUSCHLEIN and A. R. BOZARTH, University of Washington.

Use of the glass electrode in non-aqueous solutions: G. ROSS ROBERTSON, University of California at Los Angeles.

The structure of cellulose acetate gels from studies of diffusion: LEO FRIEDMAN and KARL KLEMM, University of Oregon.

The stoichiometric behavior of gelatin solutions: LEO FRIEDMAN, University of Oregon.

Conductivity measurements of mucic acid and alkali mucates: A. W. MARTIN, University of Idaho.

On the adsorption of $NiCl_2$ by finely divided nickel: OTTO TURINSKY, University of Idaho.

X-ray examination of the structure of para-di-iodobenzene: KERMIT GROVES, Washington Agricultural Experiment Station.

The determination of sulfur in lime-sulfur sprays: WILLIAM E. CALDWELL, Oregon State College.

A modified hook-up for the routine use of the glass electrode: E. C. GILBERT and ALAN COBB, Oregon State College.

Determination of iodine, nitrates and nitrites in sea water: L. H. EVANS and T. G. THOMPSON, University of Washington.

The use of a thermionic titrometer in the determination of lead: R. W. GELBACH and HENRY MAHNCKE, State College of Washington.

The qualitative and quantitative separation and determination of barium, strontium and calcium: A. H. KUNZ and VERNON WHITE, University of Oregon.

Silver oxalate as an oxidimetric standard: A. H. KUNZ and HENRY OTTO, University of Oregon.

A method for the preparation of telluric acid: L. I. GILBERTSON, State College of Washington.

The volatilization of copper during reduction of the oxide: M. J. MARSHALL, University of British Columbia.

Investigation of a mercury vapor lamp for accelerating the bleaching action of dibenzoyl peroxide: C. H. BAILEY, University of Minnesota.

Evaporation of waste sulfite liquor by submerged combustion: F. H. CONRAD, University of Washington.

The adsorption of water by cements: R. H. JONSON, Oregon State College.

Dissolved silicon in sea water of the Strait of Juan de Fuco and the San Juan Archipelago: T. G. THOMPSON and HAROLD HOULTON, University of Washington.

The boron content of sea water: M. W. HARDING and E. G. MOBERG, The Scripps Institution of Oceanography, La Jolla, California.

The free energy, heat content and entropy of bromine chlorides: P. D. BRASS and D. M. YOST, University of California at Los Angeles.

The physico-chemical properties of selenium and tellurium fluorides: W. CLAUSSON and D. M. YOST, University of California at Los Angeles.

On the revision of the specific heats of elements and compounds, based upon the law of mathematical probability: GEORGE A. LINHART, Riverside Junior College, Riverside, California.

The physico-chemical properties of iodine cyanide: D. M. YOST and W. E. STONE, University of California at Los Angeles.

GROUP II

The preparation of tri-p-tolyl selenonium dioxide: W. E. BRADT, State College of Washington.

The optical properties of carotenes from different sources: JAMES H. C. SMITH, Carnegie Institution of Washington.

Effect of sulfurous acid on the corrosion of monel metal by grape juice: E. M. MRAK, University of California.

Need for improved methods for the isolation and purification of lignin: E. C. JAHN, University of Idaho.

Chemical composition of Pacific Coast cranberries: JANICE M. CONKLIN and R. P. COPE, State College of Washington.

The use of sodium thiosulphate as an agent for the elimination of arsenic in a case of arsenic poisoning: OTTO TURINSKY, University of Idaho.

A study of the vitamin A content in yellow-tissued and white-tissued varieties of apples: MYRA T. POTTER, State College of Washington.

Avian metabolism of calcium and phosphorus: CLAYTON KEMPF, Washington Agricultural Experiment Station.

The preparation and study of l-cystine: J. D. PATTERSON, Oregon State College.

On the heterogeneity of crystalline insulin: J. MURRAY LUCK and BURT DAVIS, JR., Stanford University, California.

The mechanism of polymerization reactions: WILLIAM CHALMERS, Vancouver, B. C.

The effect of solutes upon the expansion of starch granules: AGNES F. MORGAN and G. M. NEVENZEL, University of California.

The preparation of derivatives of uric acid, particularly alloxantin: MORSE WALDORF and O. E. SHEPPARD, University of Montana.

Following a chemists' dinner Thursday evening, at which about 85 were present, an announcement of the winners of the intersectional high-school contest was made. Preliminary elimination contests were conducted by various sections within their own area. The contest was conducted by Dr. J. H. Norton, of Sacramento Junior College, Dr. C. R. Kinney, of the University of Utah, and Dr. Johnson, of Willamette University. The trophy was awarded to the team from the High School of Montesano, Washington.

At the close of the Friday morning session the chemistry group was taken to the University of Idaho by car. After lunch in Moscow and a tour of the campus and laboratories, the section attended a lecture by Dr. C. H. Bailey, professor of agricultural biochemistry of the University of Minnesota, and recent recipient of the Thomas Osborne medal for distinguished contributions to cereal chemistry.

At the business session, Dr. C. R. Kinney, of the University of Utah, was elected a member of the intersectional committee to succeed Dr. O. F. Stafford, of the University of Oregon, whose three-year term expires. The personnel of the executive committee, Pacific Intersectional Division of the American Chemical Society, for the coming year will therefore be: Dr. G. Ross Robertson, of the University of California at Los Angeles, *chairman;* Dr. J. L. St. John, State College of Washington; and Dr. C. R. Kinney. Dr. Kinney will be chairman of the program committee for the intersectional meeting to be held next year at the University of Utah, Salt Lake City.

AMERICAN ASSOCIATION OF ECONOMIC ENTOMOLOGISTS, PACIFIC SLOPE BRANCH

(*Report by H. A. Scullen*)

The meeting of the Pacific Slope branch of the American Association of Economic Entomologists was attended largely by entomologists from the Pacific Northwestern states. The meetings extended from 9:30 A. M. on June 16 through the afternoon of that day and the forenoon of June 17. The usual entomologists' dinner was held on the evening of June 16 with an attendance of about 40. Following a short business meeting on the opening forenoon several papers were presented on the wireworm problem. Russell F. Lehman presented a paper on the laboratory and field experiments with various attrahents against the adults of *Limonius canus* and *L. californicus.* The author reported that approximately 200 essential oil and aromatic compounds were tested in the laboratories and the most promising ones were further tested in the field. The same author reported on experiments with various poison baits against the larvae of *Limonius canus.* W. C. Lane gave two papers, one entitled "Carbon Bisulfide as a Control for Wireworms," in which he gave the results of further study on the use of this gas as a soil fumigant. The second paper by the same author and his assistants presented the results of a study of wireworm populations in soils. Roy E. Campbell and N. W. Stone reported on work with chloropicrin and sulfur in connection with wireworm control work. The former gave promising results, while the latter proved to have no effect on the wireworm population. A. O. Larson and Frank E. Hinman gave a brief report on the results of the study of the population of insects in cultivated fields following the harvest of a pea crop in the Willamette Valley. B. G. Thompson reported that a liquid extract of pyrethrum (Pyrocide 20) with diatomaceous earth proved effective in the control of several insects, including *Diabrotoica soror* and tent caterpillars. It was not effective as a control for the pea aphis. George M. Lift gave a brief report on the introduction and colonization of the parasite *Trichogramma minutum* Riley in codling-moth control in the orchards of Colorado. E. J. Newcomer reported on recent studies of the life history and injuries of the pear leaf blister mite as found in the West. A. L. Strand offered some suggestions on the physiological actions of oil sprays. R. H. Robinson presented a paper on water-soluble

arsenic in oil emulsion-lead arsenate combination sprays, calling attention to the excessive amounts of water-soluble arsenate that are liberated under certain conditions. D. E. Penney presented a paper setting forth the results of a study showing the relation of the navel orange to oil sprays which has been carried on for several years.

Ralph Schott and Charles F. Doucett reported the finding of *Liothrips vaneeckei* Preistner in the Northwest. Randall Latta reported favorable results with the use of vapor heat in the treatment for the control of narcissus pests. R. L. Webster reported on the potato flea beetles, *Epitrix cucumeris* Harris and *E. subcrinata* Laconte. The former is more limited in its distribution and more injurious to the tubers. The latter is more generally distributed and feeds more upon the roots of the potato. Walter Carter reported on new methods developed in the control of the pineapple mealy bug in the Hawaiian Islands. The same author reported briefly on the results of a study of tobacco dust in the control of yellow spot disease of pineapple. Charles E. Woodruff reported that he had found a very marked effect on the honey-bee by changes in atmospheric pressure, which they can usually compensate for over a fairly wide range. The same author reported on studies made on the conditions affecting the growth of wireworms. Robert E. Wall presented a discussion of pale western cutworm population trends as related to drouth periods in Montana. Frank F. Cowan presented a paper on the variance method and its use in analyzing certain entomological data. The application of this method in the study of the results of grasshopper bait experiments was given in detail. W. Earl Shull, Merrill K. Riley and Charles H. Richardson presented a brief report on the study of the effects of certain toxic gases on the blood of the cockroach, *Periplaneta orientalis* (Linn). R. W. Haegele and Claude Wakeland presented some results on the use of pyrethrum in the control of *Mineola scitulelle* Hulst, a pest of prunes in southwestern Idaho.

The following officers were elected for the ensuing year: *President,* Dr. R. L. Webster; *vice-president,* George L. Reeves; *secretary-treasurer,* H. A. Scullen.

American Meteorological Society

(Report by Charles C. Garrett, secretary for Pullman meeting)

Eighteen papers were presented and two read by title in four sessions on June 16 and 17. On Thursday morning George V. Sager gave a paper on "The Long-term Trend of Rainfall in the Central Sierra Region." In the discussion Edward L. Wells showed a graph of annual rainfall totals in Oregon, beginning with 1850. A paper by Charles C. Conroy on "The Distribution of Early and Late Seasonal Rains in Southern California" was read by Mr. Wells. The effect of a timber canopy on the weather beneath was shown by George M. Jemison. If the forest cover is removed, partially or completely, the average temperature is raised, relative humidity lowered, wind movement increased, evaporation more than doubled and temperature of the surface duff decidedly increased. Other papers by Forest Service officials were presented during the Friday forenoon session. That by W. G. Morris, read by R. E. McArdle, on "The Occurrence and Behavior of Lightning Storms in the National Forests in Oregon and Washington," brought out the fact that 66 per cent. of all lightning fires are caused by wide-spread storms which occur on about four days during each summer. Emphasis should be placed on the prediction and fire-fighting plans for the "general" type of storm day. H. B. Shepard's paper on "Rating Summer Climate for Forest Fire Insurance Purposes" was read by T. T. Munger. It was based on a study of the geographic variation of summer climate as it affects forest-fire hazard, in connection with determining insurance ratings for the Douglas fir region of western Oregon and Washington. T. C. Elliott told of the origin of the name "Chinook," as applied to warm, dry winds. The concluding paper of Thursday morning's program was by C. C. Garrett. Certain climatic anomalies of the Walla Walla Valley consist of relatively high winter mean temperature, due to frequent foehn winds; and low winter sunshine percentage, resulting from the prevalence of valley fog. Other papers bearing on local climatology were by Archer B. Carpenter, on "Fog at Portland, Oregon," and by E. M. Keyser, on "Significance of Weather Abnormalities at Spokane." These were given on Thursday afternoon. Mr. Carpenter had made a detailed study of fog types for two winter seasons, and concluded that while Portland has less fog than cities to the north and south, it has more fog types. Mr. Keyser contrasted some outstanding weather abnormalities at Spokane with those at other points or other seasons, when such conditions are normal. A paper, presented by Jesse W. Smith, Joe R. Fulks and Raymond R. Paul, was read by Mr. Fulks. It was a statistical study of daily minimum temperatures at Winnemucca, Nevada. "Erosion and Runoff Data from Differently Cropped Controlled Plots at the Pacific Northwest Soil Erosion Experiment Station," was the subject of a paper by W. A. Rockie. It is his belief that the now prevalent system of summer fallowing land is, from the erosion standpoint, very bad practice. The results further show that runoff and erosion are largely prevented by any winter vegetative cover except newly seeded winter wheat. O. W. Freeman discussed "The Climate

of the Inland Empire as Related to Geology." His study of fossils, deposits and erosion brought forth evidence of significant changes in climates of past eras, with characteristic flora and fauna. Following this paper, Edwin T. Hodge gave an address on "The Degree of Frigidity in Oregon and Washington during the Pleistocene." He advanced a new theory regarding the climate and the cause for the presence of the larger animals during the era under discussion, *viz.*, relatively high temperature beyond the glacial fringe and abundant precipitation, with consequent dense vegetation.

The morning session on Friday was opened by a paper on "Electric Charges in the Air," by Joseph G. Brown. Near the surface of the earth the air is positively charged all the time, except when it rains or is very dusty. According to theory we would have in a quiet atmosphere a very great excess of positive ions in a surface layer only 20 to 50 meters deep, but we may assume that the circulation of the air will carry this dense positive layer throughout the trophosphere and thus produce the distribution which exists. The daily variation of the space-charge is shown to be related to the daily variation of the wind, and the potential gradient to the convection system. Malcolm Rigby told of recent researches on the aurora, and outlined the work planned by the Weather Bureau in regard to observations of the phenomenon during the international polar year. A paper by C. O. Schick on the feasibility of aircraft flight across the Cascade Mountains of Washington was read by the acting secretary.

A short session was held on Friday afternoon. Edwin H. Jones read a paper on "Identification of Pressure Types." Besides explaining his use of type maps for local minimum temperature forecasting and for estimating winds in the spray-weather forecasts, the author suggests that a system along the line of fingerprint identification might be applied to synoptical charts of large areas. Leland H. Johnson told of "Pressure Gradients as an Index of Nocturnal Winds at Corona, California." An endeavor was made to show by a composite chart on which normal lines of pressure difference and smoothed values of temperature maxima and corresponding minima have been entered that the departure of these lines from the hygrometric formula estimate will show the normal effect of winds upon the final minimum temperature. Papers by James M. Jones, on "Some Outstanding Wet Seasons in California," and by David R. McGinnis, on "The Climate of the Brazilian Plateau," were read by title.

Resolutions were adopted, thanking the faculty and trustees of Washington State College for courtesies extended. It was urged that the work of the Airways Weather Service be given every support and encouragement in analyzing the data collected so abundantly from their numerous observations.

On Friday a get-together luncheon was enjoyed at noon by meteorologists and friends, at which time short talks were given by some who had performed meteorological service, respectively, in Alaska, Porto Rico, Canal Zone and Hawaii.

AMERICAN PHYSICAL SOCIETY, 178TH MEETING

(Report by Leonard B. Loeb, secretary for the Pacific Coast)

The sessions began at 9:30 in the morning of June 17, extended until noon, and were resumed in the afternoon at 2:00 o'clock, terminating at 4:30. The titles of the papers were as follows:

The energy distribution of electrons in field current emission: JOS. E. HENDERSON, R. K. DAHLSTROM, FRANK R. ABBOT, University of Washington.

Mobilities of sodium ions in helium measured in short time intervals: LEONARD B. LOEB, University of California.

Electroscope of high charge sensitivity: E. J. WORKMAN and H. B. DEVORE, California Institute of Technology.

Photoelectric currents in gases between parallel plates as a function of the potential difference: NORRIS E. BRADBURY, University of California.

On the specific heats of ferromagnetic materials: PAUL S. EPSTEIN, California Institute of Technology.

Mobilities of gaseous ions in mixtures of hydrogen and nitromethane and hydrogen and methyl cyanide: ELIZABETH A. HIGLEY and CAROLYN C. THORSEN, University of California.

Determination of the coefficient of ionization by collision using large plate distances and higher pressures: FREDERICK H. SANDERS, University of California.

The distribution of electrons in the photo-effect by Roentgen rays, classically treated: JAKOB KUNZ, University of Illinois.

A theory of the Raman rotation spectra: WILLIAM V. HOUSTON, California Institute of Technology.

Secondary effects in the ionization by hard gamma-rays: E. J. WORKMAN, California Institute of Technology.

Absorption bands in the infra-red spectrum of Venus: W. S. ADAMS, and THEODOR DUNHAM, JR., Mt. Wilson Observatory.

The absolute magnitudes of the O5 to B2 stars determined from the interstellar lines: J. A. PEARCE, Dominion Astrophysical Observatory.

On the temperature of Wolf-Rayet stars and novae: C. S. BEALS, Dominion Astrophysical Observatory.

Further details ascribable to bands of the carbon isotope C_{13} in stars of spectral classes R. and N.: R. F. SANFORD, Mt. Wilson Observatory.

An investigation of the hydrocarbon bands in the solar spectrum: R. S. RICHARDSON, Mt. Wilson Observatory.

The last five papers constitute the contribution of the Astronomical Society of the Pacific to the joint meeting of the Physical Society and the Astronomical Society of the Pacific.

There were twenty-five members of the Physical Society in attendance, covering institutions from San Diego to the University of British Columbia.

It was agreed that the 181st meeting of the American Physical Society would be held on December 16 and 17, 1932, at the California Institute of Technology, Pasadena.

The members of the Physical Society enjoyed a joint luncheon at noon, June 17, and a joint dinner on the evening of June 17, with some twenty-five members in attendance.

In spite of its small size, the meeting was highly successful in the renewal of contacts which it gave between members of the society in the Pacific Northwest and those from other portions of the Pacific area.

American Phytopathological Society, Pacific Division

(*Report by B. A. Rudolph, secretary-treasurer*)

At the sixteenth annual meeting of the society the following officers were elected to serve the society for the next two years: H. E. Morris, *president;* F. P. McWhorter, *vice-president;* B. A. Rudolph, *secretary-treasurer;* J. M. Raeder, *councilor.* Three half-day sessions were held, during which nineteen papers were presented, brief reports of which follow: R. Sprague showed that soil moisture, which is directly correlated with seasonal precipitation, is the determining factor in the relative yearly seriousness of footrot of cereals due to *Cercosporella herpotrichoides* Fron. G. A. Huber discussed the relationship of temperature to the fruit rot of apples occasioned by *Aspergillus sclerotiorum* n. sp. L. K. Jones discussed the means by which the common tobacco virus and latent potato virus reach tomato plants, in which the combination of the two produce "streak." There was also described a quick simple method of inoculating plants with viruses with minimum chance of contamination. The method applies both to fresh and dried material. F. P. McWhorter minutely described symptoms of, also a means of photographing, narcissus mosaic, which is transmitted through the bulbs. He also presented a theory that variegated colors in tulip flowers are the result of the interaction of two viruses, one which intensifies color, one which destroys it. B. F. Dana concluded, from the refractory results of his experiments to transmit the beet curly top disease mechanically to beet, tomato and spinach, that the virus is most active and amenable to transfer soon after infection rather than at any other time. F. P. Mehrlich discussed the physiology and pathogenicity of species of *Phytophthora* which cause pineapple heart-rot. Taxonomic studies and interhost relationships with weeds and green manure plants have been studied. An exhaustive series of trials with fungicides of widely varying formulae showed that Bordeaux 1–0.65–3, used as a dip, afforded very appreciable control. L. Childs found perithecia, presumably of *Mycosphærella tulasnei,* in pear-twig lesions caused by *Venturia pyrina.* The two fungi discharge their spores at the same time, rendering it difficult to determine the same for the scab fungus alone. W. Carter showed that the mealy bug *Pseudococcus brevipes* (Ckl.) produces two definite wilts in pineapple, one quick, one slow, both probably due to a toxic, variably diffusible secretion of the insect. Two types of leaf spotting results, one chlorotic and the other designated as green spotting. The latter is produced only by certain individuals of the species which are distinguished by a difference in body color. J. R. Kienholz reported on the host relationships and cultural differences of perennial cankers and anthracnose fungi. *Neofalbraea malicorticis* and *Gloeosporium perennans* may be distinguished one from the other by means of certain dyes added in high dilution to culture media. K. F. Baker and F. D. Heald have found that lenticel infection of apples by *Penicillium expansum* (blue mold) is probably responsible for much of the decay heretofore assumed to have been brought about through the means of mechanical injuries. G. Burnett discussed the longevity of the latent and vein-banding viruses of potato in dried leaf tissue. P. Miller reported the successful results obtained with sprays during the past two years for control of walnut bacteriosis. Life history studies of the organism and climatic relationships to the disease have been studied extensively. B. F. Dana and F. P. McWhorter minutely described a serious mosaic disease of horseradish. Turnips and mustard infected by mechanical means developed the disease with symptoms like those on horseradish. G. A. Huber and F. D. Heald have made a careful study of the number and kind of spores drifting in the air of various apple orchards. Similar studies covered the spore load of fruit boxes and gloves. Various processes used to remove arsenical residues reduce the spore load but do not appreciably control storage rots.

American Society of Ichthyologists and Herpetologists, Western Division

(*Report by J. R. Slater, secretary pro tem.*)

At the fourth annual meeting, held on June 17, a short business session was held and the following officers were elected: Dr. B. W. Evermann, California Academy of Science, *president;* Dr. V. M. Tanner, Brigham Young University, *vice-president;* and Dr.

L. E. Griffin, Reed College, Portland, Oregon, *secretary-treasurer.*

Exhibits of living material were as follows: *Eumeces skiltonianus, Uta stansburiana, Sceloporus gracilis, Chrysemys picta belli, Pituophis catenifer heermanii, Thamnophis ordinoides vagrans, Coluber constrictor mormon, Triturus torosus, Ambystoma macrodactylum, Bufo boreas boreas* and *Scaphiopus hammondii* from the northeastern part of Oregon, all by J. S. Brode, Pendleton, Oregon; *Masticophis taeniatus,* by P. H. Pope, Whitman College; *Scaphiopus hammondii* in burrow from central Oregon and Oregon rattlesnake, by Arthur and Ruth Svihla, Washington State College; *Ascaphus truei, Scaphiopus hammondii* (adult and tadpoles), *Rana pretiosa* (Alpine variety from Washington state) and a *Rana* of undetermined species from British Columbia, by J. R. Slater, College of Puget Sound.

Museum specimens of amphibians and reptiles of Walla Walla, prepared by the paraffin infiltration method of Noble and Jaeckle, were exhibited by W. J. Brooking and P. H. Pope, Whitman College, and cleared specimens of *Ascaphus truei* and *Rana pretiosa* by A. Svihla.

The following papers were presented:

Observations on the life history of Ascaphus truei: P. G. PUTNAM, Pullman, Washington (read by L. E. Griffin).

Herpetology of Whitman County, Washington: ARTHUR SVIHLA. Three distinct living conditions exist in this county: pine forests, bunch grass lands and scablands. The amphibians and reptiles, thirteen species in all, found in each were listed.

Nesting habits of the crested blenny, Anoplarchus purpurescens: LEONARD P. SCHULTZ and ALLAN DELACY, University of Washington. The nests of this blenny were found under stones at zero tides on the beach in Lincoln Park, Seattle. Parents are supposed to shape the egg masses by bending their bodies around them. The parents guard the nests.

Ecology and adaptations of the reptiles of sand deserts: W. MOSAUER, University of California at Los Angeles. By slides and motion pictures many features of adaptation of reptiles to the sand conditions were shown.

The Cyprinoid fishes of Lake Lanao, Mindanao, Philippines and their evolution: ALBERT W. HERRE, Stanford University. From his study of the fishes on the islands north and east of Borneo, the author concluded that seventeen species or sub-species which he has described from Mindanao must have developed from the one species *Barbodes binotatus.* It was referred to as a fine problem in evolution for biological study.

Feeding habits and moult of Crotalus confluentus oreganus in captivity: TRACY I. STORER and BERYL M. WILSON, University of California, Davis (read by title).

Notes on some Washington amphibians: JAMES R. SLATER, College of Puget Sound. The known distribution of *Rhyacotriton olympicus* is extended down the coast counties and up the Columbia to within a few miles of Kelso. The distribution of *Plethodon vandykei* was also extended to three new counties in western Washington. The occurrence of pairing of *Rana pretiosa* in the high Cascades was cited. The animals remained in embrace all winter. Eggs of *Scaphiopus hammondii* were hatched and reared in the laboratory. The young were found to be very active and capable of rapid development.

Variation within sub-species: R. R. HUESTIS, University of Oregon. A study in color variation in mice.

Recent avian food habit studies: J. HOOPER BOWLES, Tacoma, Washington (read by title).

Some details of the structure of the ear of Squalus acanthias, S. sucklii and Mustelis canis: LAWRENCE E. GRIFFIN, Reed College. Slides were used to show the difference in the ears of these dogfish.

Sympathetic ganglia of Squalus sucklii: SIDNEY S. MAYER and L. E. GRIFFIN, Reed College. Slides were used to show how this structure differed from any previous description.

Amphibians and reptiles of Umatilla County, Oregon: STANLEY BRODE, Pendleton, Oregon. Twelve species of reptiles and six species of amphibians were listed.

ASTRONOMICAL SOCIETY OF THE PACIFIC

(Report by F. J. Neubauer)

Two forenoon sessions and one joint program with the American Physical Society were given over to the twenty astronomical papers presented. The titles of these and the names of their authors are given in the following list:

The spectroscopic binary boss 2035: F. J. NEUBAUER.

Sun-spots and the weather: SETH B. NICHOLSON.

The galactic rotation effect in open clusters: PHYLLIS HAYFORD.

Wave-lengths in A-type stars: W. E. HARPER.

The green auroral line in the spectra of Novae: PAUL W. MERRILL.

The audibility of the aurorae and their appearance at low atmospheric levels: C. S. BEALS.

The present phase of the solar cycle: SETH B. NICHOLSON and MISS ELIZABETH STERNBERG.

The new ball-bearing support system for the 100-inch mirror at Mount Wilson: F. G. PEASE.

Note on the spectroscopic binary beta Coronae Borealis: F. J. NEUBAUER.

A test of the constancy of magnitudes of the bright stars in Messier 4: F. S. HOGG and HELEN B. SAWYER.

The orbital elements and minimum masses of seven O and B spectroscopic binary stars: J. A. PEARCE.

The dispersion of radial velocity and galactic distribution of variable stars of intermediate and short period: A. H. JOY.

The orbits of four spectroscopic binaries: W. E. HARPER.

On the broadening of lines in stellar spectra: DONALD H. MENZEL.

The clock problem in relativity: J. W. CAMPBELL.

On the afternoon of June 17 a joint program was held with the American Physical Society. Five papers were presented, the titles of which are given elsewhere (*cf.* report of American Physical Society).

BOTANICAL SOCIETY OF AMERICA, PACIFIC DIVISION

(Report by F. D. Heald, secretary)

Two sessions were held for the presentation of papers, the first on the afternoon of June 16, the second on the morning of June 17, with President G. B. Rigg, of the University of Washington, presiding. At the first session nine papers were presented covering the following subjects: Methods of studying kelp colloids, effect of aeration on root and top development of *Pinus contorta,* effect of pH value on fruit oxidase activity, carbohydrate content of the tomato fruit, the significance of transpiration, the Sphagnum bog at Ft. Bragg, California, the relation of chlorophyll content of leaves to catalase activity, the transfer of genes in species hybrids of Triticum and a wheat-rye hybrid formed by adding a rye chromosome pair.

The secretary arranged for the dinner of biologists which was held at 6:00 P. M. in the College Commons. Dr. G. B. Rigg, president of the Botanical Society, Pacific Division, acted as toastmaster. Brief responses were offered by representatives of the participating biological societies, describing in a humorous vein the way in which their particular society had contributed to the present financial depression.

At the second session for the presentation of papers the following subjects were discussed: Some features of the cytology of hybrids; cytotaxonomy of the genus Nicotiana; some factors influencing the penetration of herbicides; some pathologic changes in the anatomy of leaves of the sugar beet affected by the curly top, *Cercosporella herpotrichoides*—a fungus associated with a definite ecological area; the American *Amanita muscaria;* the Agaricaceae of Washington; the influences of certain environmental and physiological factors on the absorption of sulfur by vegetation; the effect of leaf destruction by sulfur dioxide fumigation and corresponding clipping on the yield of alfalfa and grain; and preliminary notes on the petrified forests of central Washington.

Officers were elected for next year as follows: *President,* Dr. E. P. Meinecke, principal pathologist, U. S. Department of Agriculture, Ferry Building, San Francisco, California; *secretary,* Dr. George R. Hill, director, Department of Agricultural Research, American Smelting and Refining Company, Salt Lake City, Utah.

JOINT MEETING OF THE COMMITTEE ON THE OCEANOGRAPHY OF THE PACIFIC AND THE WESTERN SOCIETY OF NATURALISTS

(Report by T. Wayland Vaughan)

A joint meeting of Canadian and United States members of the Committee on Oceanography of the Pacific and the Western Society of Naturalists was held during the afternoon of June 17. Dr. T. Wayland Vaughan presided. Eighteen were present. The University of British Columbia and the Marine Biological Station at Nanaimo, the Oceanographic Laboratories of the University of Washington, the University of Oregon, Stanford University and the Scripps Institution of Oceanography of the University of California were represented. The present activities of the different marine stations along the Pacific Coast were discussed under the topics: Geological investigations, especially studies of marine bottom deposits, dynamical oceanography, chemistry of sea-water and biological investigations. The purpose of the discussion was to see in how far it might be desirable to coordinate programs of research. The discussion led to satisfactory arrangements, especially for investigations in dynamical oceanography and the chemistry of sea-water. At present Scripps is the only institution along the Pacific Coast which has a definite and continuing program for the study of the geological aspects of oceanography. Although biological investigations are prosecuted at all the institutions along the Pacific Coast, it does not now seem practicable to arrange either programs of cooperation or to coordinate the investigations at the different laboratories. The conference was helpful in understanding the problems of the different organizations. The opinion, previously expressed at Eugene, Oregon, in 1930, was reaffirmed that every year there should be such a conference of the representatives of the different institutions engaged in oceanographic work along the Pacific Coast and of others interested in oceanographic research. The opinion was also expressed that the date of the meeting should be set so that it would not conflict with the schedule of summer activities at the Friday Harbor Laboratory of the University of Washington and the Hopkins Marine Station of Stanford University. If the meetings of the Pacific Division of the American Association for the Advancement of Science could be held in September instead of in June, the difficulty mentioned would be obviated.

PACIFIC NORTHWEST BIRD AND MAMMAL SOCIETY

(Report by Leo K. Couch, secretary)

A special program meeting of the society was held on June 16 and 17, 1932, in connection with the an-

nual meeting of the Pacific Division, American Association for the Advancement of Science.

The meeting was called to order by President Hall, who in a few introductory remarks sketched the history of the society. He commented on the *Murrelet*, the Society's triennial publication, and the reputation it has among journals of like standing in the country. He referred to an article recently appearing in SCIENCE by Tracy I. Storer, in which the author refers to the *Murrelet* as a publication of value to students in mammalogy and ornithology.

The following papers were presented:

Recent observation in migratory waterfowl of the interior: WEBSTER H. RANSOM, Spokane, Washington. Several years of drought ending in 1931, caused a chaotic condition to exist in nesting areas of interior United States and Canada frequented by migratory waterfowl. Conditions on the Pacific Coast were not so serious. The author cited hundreds of small lakes, ponds and sloughs that dried up completely in 1930–31. In eastern Washington and northern Idaho his observations showed that drainage projects since 1922 had reclaimed for agricultural purposes 50,000 acres that otherwise were valuable breeding areas for ducks and geese. The inter-mountain country was favored in 1932 with abundant water supply, with the exception of the Great Bear Lake district in Alberta where drought still continues.

A comparative life history study of the deer mouse (Peromyscus): DR. ARTHUR SVIHLA, Pullman, Washington. The author has had an intimate association with various species of *Peromyscus*, working out the life histories under controlled laboratory conditions. Data were presented on mating, parturition, gestation period, number of young, weights to maturity and the correlation between physiological and morphological characters. Mice used were *Peromyscus maniculatus, leucopus* and *truei*, and *Peromyscus californicus* and *eremicus*.

Type locality records of Washington mammals: F. S. HALL, Seattle, Washington. All the literature reviewed in which the now recognized species of Washington mammals were described reveals 65 species and sub-species, of which the type specimens were taken from the State. The list as presented was illustrated by museum skins taken from the Charles R. Connor Museum, State College of Washington.

Importance of bird and mammal enemies of insects in general: R. L. WEBSTER, Pullman, Washington. Personal experiences and research leads the author to the conclusion that the bird and mammal factor in insect control is greatly overrated. The controversy is revived over whether insect species for food are selected according to preference or those which are abundant and easier to take. Dr. Webster leans toward the latter theory. Birds are important factors where insect species are an ebb in abundance, but are almost powerless in general insect plagues. He cited grasshoppers and orchard insects as examples.

Rate of replacement in species: THEODORE H. SCHEFFER, Puyallup, Washington. The author has attempted to set up a "replacement rate" in bird and mammal species, which he defines as the combination of the average size of litters or broods with the number of broods in a season of 12 months. Field studies on *Perognathus lordi* near Lind, Washington, over four seasons showed the average litter size to be 5.16. This multiplied by the number-of-broods factor which he found to be 1.13, gives the "replacement index" as 5.83. Illustrating further with *Peromyscus maniculatus gambeli*, the average litter was found to be 5.3. The number-of-broods factor was 4.08. Multiplying the two gives a replacement rate of 21.62.

Chronological data on elk introductions into Oregon and Washington: LEO K. COUCH, Olympia, Washington. While Rocky Mountain wapiti (*Cervus canadensis canadensis*) were almost unknown in Oregon and Washington in the memory of white man prior to 1911, since then several shipments were made from Montana and Wyoming into the two states, where at the present time these elk are found in the Cascade and Blue Mountain areas. The Olympic wapiti (*Cervus c. occidentalis*) is confined largely to the Olympic Mountains south through Western Oregon to California.

Mammals of Whitman County, Washington: ARTHUR SVIHLA, Pullman, Washington. For the sake of mammal study the upper Sonoran and Transition life zones were divided into the low elevations along the Snake River, the sage brush, and timbered areas. Through collections made for the Connor Museum, Washington State College, 33 mammal species are represented in the county.

Analysis of factors affecting bird and mammal surpluses: IRA N. GABRIELSON, Portland, Oregon. Some factors regulating the rise and fall in faunal numbers are food supply, fecundity, weather conditions, disease, predatory species and old age. Twenty years of personal observation have led the author to believe that food supply and disease are the two greatest factors regulating abundance. Weather conditions and food supply are closely associated, while sudden storms and temperature changes work havoc with many species over short periods.

Following the presentation of papers, Dr. Svihla led the group to his laboratory, where studies were being made on caged *Peromyscus, Perognathus, Dipodomys* and others.

The morning session on the 17th was held jointly with the Western Division, American Society of Ichthyologists and Herpetologists.

The last hour of the afternoon meeting was turned into a round table discussion on birds, to which Professor Slonaker and Messrs. Couch, Gabrielson and Ransom contributed.

SOCIETY OF AMERICAN BACTERIOLOGISTS, EASTERN WASHINGTON-IDAHO BRANCH

(Report by Victor Burke)

During the session on Friday, June 17, sixteen papers were presented. Dr. Rachel Hoffstadt sub-

mitted a communication on the dissociation of *Staphylococcus aureus*. Dissociation resulted in four biochemical types. N. P. Sullivan reported that antiseptic dyes introduced into the intestine destroys the vegetative bacterial cells, nothing but the spores surviving. R. L. Tracy described the lethal effect of alternating current on yeast cells. Dr. John Weinzirl reported that desensitization in tuberculosis with tubercle bacilli killed by chemical or physical agents is unsatisfactory, due to denaturation of the proteins. Complete desensitization was obtained with the protein in Long's SMT. Dr. Victor Burke reported the appearance of agglutinins in rabbits but not in man following vaccination *per os* with *Brucella abortus*. Agglutinins introduced into the stomach failed to appear in the blood stream. In a second paper he presented experimental evidence, suggesting that there is probably a wide interchange of bacteria between land and sea. He also showed tadpoles in the leg stage reared exclusively on a diet of bacteria. Dr. R. E. Stier reported experiments to show that gas bacillus infection may result from massaging the organism into a hypodermic needle wound. Fred Gibson reported that there is no relation between the electric charge and the Gram reaction of the cell. V. A. Cherrington reported that the leucocyte count of milk of cows suffering with mastitis is nearly always more than 100,000 per cc and that the milk of normal cows rarely contains more than that number. Dr. W. V. Halversen reported on a study of the comparative value of various tests for mastitis. The leucocyte count, the catalase test and the bacterial count on blood agar appear to have the most value. Dr. William Levin reported that there exists a fair agreement between the antigenic value of a diphtheria toxoid as determined by the Ramon flocculation test and the guinea-pig method of the National Institute of Health. There was no marked correlation between the degree of immunity conferred on children by various toxoids and their antigenic values as determined by the above tests. Dr. H. J. Sears and Martha Rohner described some variable intestinal organisms and their possible relation to disease. In a second paper they described the characteristics of slow lactose fermenting *B. coli* strains isolated from stools and urine. Neil Black reported that irradiation of mineral oils improves their therapeutic value. G. S. Schilling reported that a correlation exists between the clinical history of sterility and breeding troubles and serological reaction for *Brucella abortus*. C. C. Prouty reported that no correlation exists between production of acid in milk and cream and accumulation of ammonia nitrogen and amine nitrogen.

SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE, PACIFIC COAST BRANCH

(Report by E. G. Martin)

The Society for Experimental Biology and Medicine, Pacific Coast Branch, met on Friday morning with about 60 in attendance. In the absence of Chairman William Ophuls, Dr. E. G. Martin presided.

Emil Bogen and Russell N. Loomis reported that tobacco tar, which has been alleged by some advertisers of special smoking equipment to be a potential source of mouth cancer, was wholly inactive in producing cancers under conditions in which gas-house tars of recognized carcinogenic action produced cancers invariably. This investigation indicates strongly that whatever may be the cause of smoker's cancer, the tar present in tobacco smoke is not responsible.

C. B. Philip and R. A. Parker have been studying the transmission of Rocky Mountain spotted fever. They have found that uninfected ticks may become infected during copulation with infected ticks. The infection thus transmitted may be imparted to the offspring. Thus sources of infection are maintained from generation to generation of ticks. They showed also that, although the most important source of Rocky Mountain spotted fever infection is *Dermacentor andersoni*, certain other species, notably *D. americani*, may also transmit the infection. Thus the occurrence of Rocky Mountain spotted fever outside the range of *D. andersoni* can be accounted for.

G. E. Davis and R. R. Parker showed that in rabbits, which have been infected with tularemia and have recovered, the reaction between the host and the parasite appears to be affected in such a way that the parasite shows a markedly greater virulence than usual. Some evidence was also obtained indicating that a certain degree of immunity is developed in some cases.

F. M. Baldwin, R. J. Shaw and P. R. Bauman found that the basal metabolism of football players who were participating regularly in intercollegiate contests rose appreciably during the days immediately preceding important games. Similar increases in basal metabolism were not seen in substitutes who did not expect to play. The inference is that the metabolic increase is related to the emotional excitement attending the anticipation of approaching contests.

Agnes Fay Morgan reported the results of studies on the effects of acid, neutral and basic diets on the calcium and phosphorus metabolism of dogs. It was found in general that dogs on an alkaline diet showed better growth and better phosphorus retention than dogs on an acid diet. Dogs on low calcium were more injured by the acid diet than by the alkaline diet.

The combination of low calcium, acid and vitamin D deficiency proved decidedly injurious, particularly to the bones and teeth. It was pointed out that the widely used American dietary of bread, meat and potatoes affords an excellent example of the above combination.

J. M. Luck, Betty Nims and Don G. Willard found an increase in formation of inorganic sulphates in dogs and rats following subcutaneous injection of glycine, alanine, aspartic acid and glutamic acid. They interpret these findings as indicating that amino acids stimulate endogenous metabolism.

Dr. A. B. Stockton showed that in patients suffering from certain types of edema the diuresis induced by sodium bismuth tartrate, although it has a latency of several days, is more prolonged and removes more water than the more prompt diuretics studied. No after-depression of urine flow was seen, nor any adverse after-symptoms. In the latter respect this diuretic is superior to other metallic diuretics examined.

WESTERN SOCIETY OF NATURALISTS

(Report by E. G. Moberg, secretary-treasurer)

A session for the presentation of papers was held on the afternoon of June 16. Under the title "The First Scientific Society in Europe," Mrs. Dorothea W. Singer gave an account of the origin and the early struggles of the *Accademia dei Lincei* in Rome. The different types of oysters grown in the Puget Sound region were shown and briefly described by Trevor Kincaid, who gave a paper dealing mainly with the introduction and methods and extent of culture of the Japanese oyster in Washington. A paper by H. W. Graham and E. G. Moberg discussed the distribution of plant nutrients, particularly phosphate, in the water of the Pacific. The paper was based chiefly on data obtained by the yacht *Carnegie*. Data comparing the efficiency of raw, evaporated and powdered whole milk in promoting growth and regenerating haemoglobin in the rat were presented in a paper by Alice M. Bahrs and C. U. Moore. From feeding experiments on planarian worms Marian Pettibone had found that not only do different types of tissues differ markedly in their power to promote growth, but that tissues from mature and embryonic animals also differ. Rosalind Wulzen showed that the growth-promoting properties of tissues depend upon the extent to which the tissue is subdivided.

The society also sponsored jointly with the Committee on the Oceanography of the Pacific a luncheon meeting, at which a number of phases of oceanographic research in progress on the Pacific Coast were discussed.

WESTERN SOCIETY OF SOIL SCIENCE

(Report by G. Orien Baker, secretary pro tem.)

Two half-day sessions of the society were held at the State College of Washington and two half-day sessions were held at the University of Idaho. The average attendance was twenty-five members.

Dean E. C. Johnson gave a brief address at the first session in which he emphasized the importance of soil research and pointed out the interest of the public of the State of Washington in soil problems. He mentioned the fact that a state advisory council on soils and soil fertility is functioning in this state for the purpose of formulating a state-wide program of soil investigation and of providing financial means to carry out the program.

Lloyd D. Doneen reported on a study of the absorption of nitrogen at different stages of growth for different varieties of wheat. He found the greatest yield was obtained by application of nitrogen fertilizers at the time the wheat was beginning to shoot and that the wheat plant, in certain treatments, contained considerably more total nitrogen at the heading stage than it did when it was ripe.

W. L. Powers reported on the characteristics of forest soils of the Pacific Northwest in which he considered the different profiles, base exchange, colloids and microbial population of several different soils from various sections of Oregon.

W. A. Rockie reported on erosion and runoff as measured from differently cropped control plots in which he showed that runoff and erosion are largely prevented by any winter vegetative cover except newly seeded winter wheat, while fallow lands seeded to winter wheat suffer enormous losses of both rainfall and soil.

N. E. Edlefsen reported on a new method of determining vapor pressure of soils which requires less time than the methods previously used.

The afternoon session was devoted; first, to visiting the Pacific Northwest Soil Erosion Station, where the various investigations in progress were explained; second, to an examination of a profile of a virgin Palouse soil; and third, to a study of the topography of the land near the breaks of the Snake River.

President Neale gave a brief address at the first session at the University of Idaho. He illustrated how the virgin soils in the United States have been depleted gradually from East to West by migrating farmers and pointed out the importance of research in soils and the necessity of making new information available to the farmer.

G. O. Baker discussed the effects of the activity of microorganisms on the composition of organic resi-

dues in two different soils and showed that there was a pronounced effect of different soils and only a slight effect of different organic materials on the sequence of activity, if the nitrogen content of the organic materials was made up to the same percentage.

Robert A. Greene reported that the Azotobacter (plaque) method of determining the fertility requirements is not applicable to any extent to Arizona soils.

O. Lilliland reported that the scorching of prune trees in the Sacramento Valley of California is associated with the potassium content of the soil. He also found the Neubauer seedling test to be a good criterion of the available potassium supply of the soil.

W. V. Halverson and R. E. Bell reported that after modifying the soil plaque method of Sackett, the results obtained show with few exception that where phosphate fertilization in the field resulted in significant increases in yield, the method showed an acute phosphorus deficiency.

Philip Isaak and R. E. Bell reported that if soils are high in acid-soluble phosphorus (above 800 pounds per acre), low in $CaCO_3$, and the pH of the acid extract is low, they do not respond to phosphorus application, but if the soils are low in acid-soluble phosphorus, high in $CaCO_3$ content, and the pH of the acid extract is high, they will respond to phosphate fertilization.

R. E. Bell discussed the rotation plots of the University of Idaho and stated that the wheat-oats-potato rotation maintained a higher level of soil organic matter than was obtained by any of the other cropping systems except where manure is applied.

G. B. McDole reported that in Idaho deep tillage done properly is giving beneficial results on soils of the texture of silt loam or heavier.

F. B. Laney discussed the geology of the Palouse region and stated that the present surface soil was brought in by the wind, but that the present topography is a result of erosion.

OBITUARY

ERNEST JULIUS WILCZYNSKI

ERNEST JULIUS WILCZYNSKI, professor emeritus in the department of mathematics at the University of Chicago, died on September 14 in Denver, Colorado, after a lingering illness of more than nine years.

In his youth he was a precocious student of mathematics. He was born in Hamburg, Germany, on November 13, 1876, but his family migrated to America when he was still quite young and settled in Chicago, where he completed his elementary and high-school education. At the age of seventeen, with the assistance of an uncle, Ellis Wilczynski, of Hamburg, he returned to Germany and studied at the University of Berlin, where he received the degree of doctor of philosophy in 1887 at the age of twenty-one.

He was very young and boyish in appearance when he came back to the United States after receiving his degree and was at first unable to secure a teaching position. His first year he spent as a computer in the office of the *Nautical Almanac* at Washington. In 1898, however, he was appointed instructor of mathematics at the University of California, and from that time to his retirement from active work in 1923 on account of illness he was a leader in mathematical research and university mathematical instruction. At California, he served as assistant and associate professor until 1907, with an interruption from 1903 to 1905, when he was in Europe as a research associate of the Carnegie Institution of Washington. He was associate professor at the University of Illinois from 1907 to 1910, and at the University of Chicago from 1910 to 1914, and professor of mathematics at Chicago from 1914 to 1926. He was made professor emeritus in 1926 when it seemed clear after three years of illness that he would never be able to return to active work. It was characteristic of his courage and his optimism that he never gave up hope of doing so.

Wilczynski's mathematical curiosity led him into varied fields. In his earlier years he wrote on astronomy and applied mathematics and differential equations. At the same time he was beginning the work in projective differential geometry which later became his principal interest and the one for which he is best known to mathematicians in this country and abroad. His methods in this domain showed great originality and power and have been widely developed by his students and other writers. He wrote also on the theory of functions of a complex variable, and seventeen of his seventy-seven published papers are distributed in miscellaneous fields different from those already mentioned.

In mathematical affairs other than teaching and research Wilczynski's career was also a notable one. He was at various times councilor and vice-president of the American Mathematical Society, and of the Mathematical Association of America. He was a lecturer at the New Haven Colloquium of the society in 1906, and associate editor of its *Transactions*. In 1909 he won a prize of the Royal Belgian Academy of Sciences, and in 1919 he was elected a member of the National Academy of Sciences at Washington.