

of inheritance and with the phototropic reactions of the normal and mutant flies.

ZOOLOGICAL LABORATORY,  
BELOIT COLLEGE

C. L. TURNER

## THE IOWA ACADEMY OF SCIENCE

THE thirty-eighth annual meeting of the Iowa Academy of Science was held at the Iowa State College, Ames, Iowa, May 2 and 3, 1924. The associated societies, Iowa Section, Mathematical Association of America, Ames and Iowa Sections of the American Chemical Society, and the Iowa State College Branch, Society of American Bacteriologists, held their sectional meetings in connection with the Academy.

The meeting was especially commemorative of President L. H. Pammel's thirty-five years of service in the state, and several of the papers and addresses were in review of the scientific work of that period. Special features of the meeting were addresses by Dr. William Trelease, of the Illinois State University, on "Personal recollections of some North American botanists," and by Dr. Herbert Osborn, of the Ohio State University, on "Recollections of early workers in entomology and zoology," a paper on "The early history of the Iowa Academy," by Dr. D. S. Fairchild, of Clinton, and the presidential address by Dr. L. H. Pammel, of the Iowa State College, on "A century of botany in Iowa."

Officers were elected as follows: *President*, O. H. Smith, Cornell College; *vice-president*, R. I. Cratty, State College; *secretary*, P. S. Helmick, Drake University; *treasurer*, A. O. Thomas, State University; *representative to A. A. A. S.*, D. W. Morehouse, Drake University.

The sectional chairmen for the ensuing year are: *Bacteriology*, Paul Emerson, State College; *botany*, H. E. Jaques, Iowa Wesleyan College; *chemistry*, H. F. Lewis, Cornell College; *geology*, W. F. V. Leicht, Simpson College; *mathematics*, E. R. Smith, State College; *physics*, P. S. Helmick, Drake University; *zoology*, Dayton Stoner, State University.

The following papers were presented:

### BACTERIOLOGY<sup>1</sup>

(Iowa State College Branch, Society of American Bacteriologists.)

*The application of electronic theory in its applications to oxidation-reduction potentials in bacteriology*: F. E. BROWN.

*The problem of stream pollution in Iowa*: H. V. PEDERSON.

*Production of hydrogen sulfide by members of the colon group of bacteria*: FRED S. PAINE.

<sup>1</sup> Abstracts of these papers will be found in the *Journal of Bacteriology*.

*Utilization of chinic acid in the differentiation of the colon-aerogenes groups: Demonstration*. B. H. BUTCHER.  
*Some observations on the Voges-Proskauer reaction*: CLAIR S. LINTON.

*The epizootology of an outbreak of anthrax in Iowa*: C. D. RICE.

*Nutrose medium as a substitute for sugar-free broth in the study of carbohydrate fermentation*: S. H. MC-NUTT and PAUL PURWIN.

*The diagnosis of bacillary white diarrhoea in chicks*: CHAS. MURRAY.

*Studies on the Morgan group of paratyphoids*: JOHN WELDON and A. G. AJWANI.

*Food preservation and so-called "food poisoning"*: G. G. DEBORD.

*The need of organizations of those engaged in laboratory diagnosis*: ROSS L. LAYBOURNE.

*A proposed grouping of the yeasts common in dairy products*: M. P. BAKER.

*Variations in the *S. lactus* group*: B. W. HAMMER.

*The present status of Wildier's bios*: E. I. FULMER.

*Theory of dye utilization in bacteriological media: Demonstration*. C. H. WERKMAN.

*Notes on the fungus flora of Iowa soils*: E. V. ABBOTT.

*Home economics bacteriology as a field for research*: CLARISSA CLARK.

*A schematic arrangement for the classification of laboratory media*: H. W. SCHOENLEN.

*A green nonfluorescent organism isolated from creamery wastes*: LULU SOPPELAND.

*Acidity as a factor in the purification of creamery wastes*: MAX LEVINE and LULU SOPPELAND.

### BOTANY

*The work of Dr. Pammel at the State College*: A. T. ERWIN.

*The house fungus, *Merulius lacrymans**: W. H. DAVIS.

*The genus *Physalis* in Iowa*: O. E. ELMER.

*Quercitron oak and its relation to soils*: RAYMOND J. BECRAFT.

*Distribution of plants on upper Skunk River, Iowa*: RAYMOND J. BECRAFT.

*Ecological notes in the Arapahoe Mountains near Frazer, Colorado*: L. H. PAMMEL.

*The Uredinales of Iowa*: J. C. ARTHUR.

*The tropograph and flectograph*: WALTER J. HIMMEL.

*The physiological barometer*: RAYMOND WALLACE.

*The physiology of growth*: CLIFFORD H. FARR.

*Certain features of the vegetation in Kansas sand hills*: FRED W. EMERSON.

*A ten-years' phenological record of the spring flowering plants*: H. E. JAQUES.

*Further studies of the germination of woody plants*: L. H. PAMMEL and CHARLOTTE M. KING.

*Viability tests of stored corn of different ages*: MISS CHARLOTTE M. KING.

*Comparative anatomy of Hubam and biennial sweet clover*: MISS ALICE M. CROZIER.

*The Polyporaceae of Iowa*: ROBERT E. FENNELL.

*Comparative rates of imbibition in apple wood tissue*: CHARLES F. ROGERS.

*Lilium michiganense* in Iowa: WIER R. MILLS.

*At what depth should clover seeds be planted?* WINFIELD SCOTT.

*What is the absolute value of the prevailing method of selecting kernels from ears of seed corn for testing purposes?* PROFESSOR WINFIELD SCOTT.

*The morphology of Basidiophora Kellermanii:* GUY WEST WILSON.

*Notes on some Colorado and Wyoming fungi:* PROFESSOR GUY WEST WILSON.

*Species crosses in the genus Cucurbita:* EDWARD F. CASTETTER.

*Iowa plant notes:* R. I. CRATTY.

*The genus Rumex in Iowa:* MR. CRATTY.

*Hybrid oaks in Iowa:* B. SHIMER.

*Prairie slopes on the bluffs of Mississippi River:* PROFESSOR SHIMEK.

*Genetic linkage between chlorophyll and carotinoid pigments in maize:* E. W. LINDSTROM.

*Inheritance of carbohydrates and fat in corn:* E. W. LINDSTROM and F. GERHARDT.

*General relation of endosperm and chlorophyll characters in maize:* W. A. CARVER. (Introduced by E. W. Lindstrom.)

*The chemical composition of wheat seedlings:* L. EDWIN YOCUM.

*Response of the genus Rhamnus to Puccinia coronata Corda:* S. M. DIETZ.

*Breeding oats resistant to Puccinia graminis avenae:* MR. DIETZ.

*Some winter flowering plants:* WILLIAM POULTER.

#### CHEMISTRY

(Ames and Iowa Sections, American Chemical Society.)

##### Physical Chemistry

*Adsorption from salt solutions by colloidal copper ferrocyanide:* MIKKEL FRANKERT and J. A. WILKINSON.

*A method of measuring rates of corrosion:* E. LEE HENDERSON, C. E. STANWART and G. H. BRODIE.

*Structural evidence of an iron-carbon eutectoid:* H. E. FLANDERS and ANSON HAYES.

*The solubility in austinite of carbon from carbon and of carbon from cementite:* H. L. MAXWELL and ANSON HAYES.

*Compressions as a factor in causing deviations of the system alcohol-water from Raoult's law:* W. H. JENNINGS and ANSON HAYES.

*The physical properties of some "short period anneal" products of white cast iron:* ANSON HAYES and W. J. DIEDERICHS.

*Determination of the colloidal material in soils:* D. VERNE MOSES.

*The electrometric determination of lime:* H. V. WRIGHT and R. B. MORRIS.

*The preparation of activated carbon from furfural residues:* GALEN HUNT.

*The use of the audion tube in chemical measurements:* EDWIN KURTZ.

*The free energy of dilution and the activity of the ions*

*in aqueous solutions of barium chloride:* J. N. PEARCE and RALPH W. GELBACH.

*The partial molal volumes of certain anions of organic acids:* J. N. PEARCE and F. E. WARE.

#### Analytical Chemistry

*The effect of pressure on the rate of decomposition of potassium chlorate-manganese dioxide mixtures:* F. E. BROWN and H. M. McLAUGHLIN.

*Spontaneous decomposition temperatures of potassium chlorate-iron oxide mixtures:* F. E. BROWN and W. C. O. WHITE.

*Some increases in potential of calomel electrode-oxidizing agent—platinum electrode cells on adding reducing agents:* W. S. HENDRIXSON.

*The incomplete oxidation of sulfurous acid by some oxidants:* PROFESSOR HENDRIXSON.

*A study of the substances in rain and snow:* NICHOLAS KNIGHT.

#### Bio-Chemistry

*Feeding potassium iodide to young growing swine:* JOHN M. EVVARD.

*Some observations on the effect of iodine administration on sheep:* J. M. EVVARD, A. R. LAMB, W. G. GAESSLER.

*The rôle of rye in the Vienna process for the manufacture of yeast:* E. I. FULMER and ROMA ELMER.

*Certain maxims to be observed in the study of the nutrition of microorganisms:* PROFESSOR FULMER.

*Relation of diet to reproduction and rearing of young:* L. T. ANDEREGG.

*Observations on the nutritive value of skimmed milk powder:* PROFESSOR ANDEREGG.

*The possibility of a new vitamine for reproduction:* V. G. HELLER.

*Metabolism and vitamine A:* C. McCAY and V. E. NELSON.

#### Industrial Chemistry

*Effect of natural alkali waters on concrete:* GEO. A. BURKE.

*Possible uses for waste chlorine:* O. R. SWEENEY and J. W. HUSSEY.

*The manufacture of oxalic acid from corn cobs:* H. A. WEBBER.

*Studies on the commercial preparation of chlorates:* H. A. CHRISTOPHERSON.

*The preparation of zeolytic water softening materials:* E. L. BARTHEL.

*The bleaching of soy bean oil with peat:* H. V. WRIGHT and G. A. PIERCE.

*Method of preparing silica absorbents:* O. R. SWEENEY, F. PFEFFER and A. L. REDSTONE.

*The preparation of permanent porcelain and quartz mats for Gooch crucibles:* G. N. QUAM and H. V. WRIGHT.

*The preparation of activated carbon from furfural residues:* GALEN HUNT.

*Chemical engineering and agriculture:* JULIAN E. MACFARLAND.

*Magnesia crucibles in an arc furnace:* EDMOND E. MOORE and ANSON HAYES.

#### Food Chemistry

*Relation of starch to the strength of wheat flour:* G. G. NAUDAIN and J. H. BUCHANAN.

#### Organic Chemistry

*A comparative study of the removal of cotton seed and corn oil stains from wool and silk:* RUTH O'BRIEN and BARBARA WENTCH.

*Action of thionyl chloride on diacetone glucose:* J. B. ALLISON.

*Some recent studies concerning organometallic compounds:* H. H. PARKER, F. SCHULZE, W. B. KING, J. M. PETERSON and H. GILMAN.

*Conclusions in regard to the methylation of phenol:* H. F. LEWIS and WESLEY J. TREESCH.

*Note on the hydrolysis of benzene:* H. F. LEWIS and J. W. THIESSEN.

*The relation of substituents in the hydrocarbon radicals to the formation and reactions of certain mixed ethers:* L. CHAS. RAIFORD and J. C. COLBERT.

#### Chemical Education

*A simple automatic mercury pump which permits the collection of the exhaust gas:* H. M. McLAUGHLIN and F. E. BROWN.

*Chemistry Department, Iowa State College, its equipment and organization:* W. F. COOVER.

*A comparison of the grades in chemistry made by pupils who were taught by the same instructor in recitation and laboratory with the grades of pupils who were taught by different instructors in recitation and laboratory:* F. E. BROWN and KENNETH L. BIRD.

*The content of chemistry courses based on data secured by the Iowa Committee on the Correlation of College and High School Chemistry:* P. A. BOND.

*A "painless" method for the preparation of chlorine:* JACOB CORNOG.

#### GEOLOGY AND ETHNOLOGY

*A dust-fall in Iowa on March 29, 1924:* EARL T. APFEL.  
*Geology of the region about Belton in northwestern Montana:* ROBERT H. SEASHORE.

*The Apache region, Arizona and its Indians:* (By title) ALBERT B. REAGAN.

*An Indian quartzite quarry near Hot Springs, South Dakota:* PAUL ROWE.

*The Algona recessional stages of Wisconsin glaciation in Iowa:* JOHN E. SMITH.

*The Fort Dodge stages in the retreat of the glaciers:* PROFESSOR SMITH.

*A preliminary state map of the Wisconsin glacial till:* PROFESSOR SMITH.

*Some theoretical stages in the retreat of the Iowan ice sheets:* PROFESSOR SMITH.

*The fauna of the state quarry beds:* (Illustrations), M. A. STAINBROOK and H. S. LADD.

*Notes on the geology of Jackson county:* HENRY S. LADD.

*The physiography of southwestern North Dakota:* PHILIP B. KING (Introduced by A. O. Thomas).

*An intra-Cedar Valley unconformity in Johnson county:* WALTER V. SEARIGHT and MAX LITTLEFIELD.

*A light colored zone of subsoil in southern Iowa:* W. G. BAKER.

*The relation of Aftonian peat beds to the Nebraskan gumbotil plain:* GEORGE F. KAY.

*A fossil pine cone from drift of northern Iowa (Illustrations):* A. O. THOMAS.

*Some goniatites from the Paleozoic of Iowa (Illustrations):* PROFESSOR THOMAS.

*Pleistocene mammalian remains recently found in Iowa (Illustrations):* PROFESSOR THOMAS.

*Ascent of Mt. Namosi, Fiji, (Illustrations):* WALDO S. GLOCK (Read by PROFESSOR THOMAS).

*A section in some late Tertiary and Quaternary marls near De Land, Florida (Illustrations):* THOMAS H. MACBRIDE (Read by PROFESSOR THOMAS).

*Application of term Pennsylvanian to Iowa Coal Measures:* CHARLES KEYES.

*Recent light on the meaning of early Devonian hiatus:* DR. KEYES.

*Eastern extension of western deserts in Iowa:* DR. KEYES.

*The deep water-well at Brighton:* J. M. LINDLY.

#### MATHEMATICS<sup>2</sup>

(Iowa Section, Mathematical Association of America).

*Reduction of the equation of the general conic section:* W. J. RUSK.

*The preparation of high school teachers of mathematics in Iowa:* E. W. CHITTENDEN and F. M. WEIDA.

*On the meaning, evaluation and application of the refund integral:* F. M. WEIDA.

*The zeros of the function  $f^k(z) \equiv \sum_{n=0}^{\infty} n^k \frac{z^n}{n!}$  where  $k$  is a positive integer:* JULIA T. COLPITTS.

*Note on the average family of brothers and sisters of the boys in families of  $n$  children:* H. L. RIETZ.

*Relation of surface level of a rotating fluid to the shape of its container:* EDWARD S. ALLEN.

*Determination of the foci and directrices of a conic section:* EDWARD S. ALLEN.

*Construction of the tangents of an ellipse:* EDWARD S. ALLEN.

*A problem in mathematics teaching:* F. M. MCGAW.

*The isobaric differential equation in an elementary course:* JOHN F. REILLY.

*A new interpolation formula:* JOHN F. REILLY.

*A theorem in spherical trigonometry:* J. S. TURNER.

*A new property of the circle:* J. S. TURNER.

*A theorem in geometry:* ROSCOE WOODS.

*The solution of  $q$ -difference equations by means of infinite determinants:* E. R. SMITH.

*Certain transformations of frequency distributions:* G. W. SNEDECOR.

<sup>2</sup> Abstracts of these papers are published in *The American Mathematical Monthly*.

## PHYSICS

*Rainbow and other atmospheric phenomena:* (By title) MRS. F. MAY TUTTLE.

*Is Iowa getting wetter or drier?* CHARLES D. REED.

*A note on daylight requirement:* WM. KUNERTH.

*Orientation of buildings on the basis of sunlight:* PROFESSOR KUNERTH.

*Preliminary report on the optical properties of magnesium:* M. E. GRABER.

*Balmer lines from hydrogen in certain gases:* E. O. HULBERT.

*On the theory of the refraction of X-rays:* PROFESSOR HULBERT.

*On the breadth of the hydrogen lines in the stellar spectra:* PROFESSOR HULBERT.

*The Balmer absorption series of hydrogen:* PROFESSOR HULBERT.

*The absorption lines in the spectrum of the metallic spark in water:* PROFESSOR HULBERT.

*Phenomena of cathode sputtering:* K. V. MANNING.

*Electrical constants of dielectrics for radio frequency:* R. V. GUTHRIE.

*Torques and forces between coils carrying currents of high radio frequency:* T. A. HUNTER.

*A note on the theory of x-ray diffraction in liquids and amorphous solids by Raman and Ramana han:* E. H. COLLINS.

*Magnetic properties of evaporated iron films:* A. J. SORESENSEN.

*The action of a Helmholtz resonator in a branch line:* G. W. STEWART.

*Measurement of the acoustic impedance of a branch line:* PROFESSOR STEWART.

*Note on the theory of the optimum angle of a conical horn:* PROFESSOR STEWART.

*The Hall effect and specific resistance in evaporated films of nickel, cobalt, palladium and platinum:* H. B. PEACOCK.

*The theory of megaphones and receiving horns:* G. W. STEWART and G. R. BUTZ.

*The M absorption limits in the tungsten x-ray spectrum:* R. V. ZUMSTEIN.

*Sparkless discharge of electrified silks and wools:* JAY W. WOODROW.

*Maxwell's treatment of networks applied to the delta connection of a three-phase power service:* ALFRED W. MEYER.

*The relative values of selenium cell and ionization methods of measuring x-rays in Roentgenotherapy:* ARTHUR W. ERSKINE and SCOTT W. SMITH, JR.

*A theoretical discussion of the intrinsic intensity and percentage of polarization of light passing through deep slits:* L. P. SIEG.

*The effect of the material composing the sides of deep slits on the intrinsic intensity of light transmitted through the slits:* C. R. SMITH. (Introduced by L. P. Sieg.)

*On the optical constants of selenium and of tellurium in the blue and ultraviolet regions of the spectrum:* R. F. MILLER. (Introduced by L. P. Sieg.)

*An experiment in effective resistance as a function of eddy current and hysteresis losses:* C. J. LAPP.

*New charts of radioactive data:* PROFESSOR LAPP.

*A search for element 61:* MESSRS. HOPKINS, LAPP and R. A. ROGERS.

*Electric arc method of making x-ray targets:* MESSRS. LAPP and ROGERS.

*A method for the production of longitudinal sound vibration in a rod:* W. D. CROZIER.

*A simple method of determining horizontal intensity of the earth's magnetic field:* E. P. T. TYNDALL.

## GENETICS, PSYCHOLOGY AND ZOOLOGY

*Is the quality of our high school students deteriorating?* C. C. ROSS.

*The content of a course in child study for girls not intending to teach:* THOMAS F. VANCE.

*The various methods used to examine students and the relative merits of those methods:* J. E. EVANS.

*Results of the testing program given at State College:* MISS NORA KLISE.

*The differential death rate of sexes in animals, with a suggested explanation:* S. W. GEISER.

*Notes on the biology of Eutettix strobi (Homoptera, Cicadellidae):* F. A. FENTON.

*Arsenical poisoning in tomato plants:* PROFESSOR FENTON.

*A study of the movements of the empty stomach in the mollusca:* T. L. PATTERSON.

*The lateral line organs of the shovel-nose sturgeon, distribution and innervation:* H. W. NORRIS.

*Keeping Iowa's waters pure:* GEORGE BENNETT.

*A preliminary list of the bees of Iowa—The genus Halictus:* RALPH L. PARKER and FREDERICK A. FENTON.

*The Odonata of Henry county:* CHARLES HOFFMAN.

*Birds of Wapello county, Iowa:* CHARLES J. SPIKER.

*Notes on the Oyster-Shell Scale, Lepidosaphes ulmi Linn:* R. L. WEBSTER.

*Photochemical distribution on the retina as shown by the perimeter:* F. M. BALDWIN.

*The effect of vitamin deficiency on blood pressure in rats:* H. B. COOK and F. M. BALDWIN.

*Snake notes:* J. E. GUTHRIE.

*Simple versus complex mineral mixtures for young growing swine:* JOHN M. EVVARD, C. C. CULBERTSON and W. E. HAMMOND.

*Trapping birds at Iowa City during 1923:* DAYTON STONER.

*The fourth volume of the first edition of Holbrook's "North American Herpetology":* B. SHIMEK.

*Three different types of genetic sterility in the parasitic wasp Habrobracon:* P. W. WHITING. Drawings.

*Two generations of selection with reference to the inheritance of scurvy resistance in guinea-pigs:* W. V. LAMBERT. Charts.

*Results of selective breeding in the parasitic wasp Habrobracon:* U. A. HAUBER.

*New measurements in the process of reading:* E. O. FINKENBINDER.

P. S. HELMICK,  
Secretary