into the Biological Importance of the Properties of Matter.''

These papers will appear in the *American Naturalist*.

The afternoon session was for the reading of papers on Genetics, the program being as follows:

R. M. Strong (University of Chicago): ''Sex-linked and Sex-limited Inheritance.'' Read by title.

L. J. Cole (University of Wisconsin): ''The Reversionary Blue Pigeon.''

B. M. Davis (University of Pennsylvania): ''The Behavior of Hybrids of *Œnothera biennis* and of *Œ. grandifloris* in the Second and Third Generations.''

George H. Shull (Carnegie Institution of Washington): (1) ''Duplicate Genes for *Bursa bursa-pastoralis*.'' (2) ''A Sex-limited Character in Plants.''

R. A. Emerson (University of Nebraska): ''The Inheritance of a Recurring Somatic Variation in Variegated Ears of Maize.''

C. M. Child (University of Chicago): ''The Fundamental Reaction System and its Significance in Inheritance.'' Read by title.

A. F. Shull (University of Michigan): ''Inheritance of Egg Characters and the Sex-ratio in *Hydatina senta*.''

J. A. Detlefsen (University of Illinois) (introduced by W. E. Castle): ''Studies of a Cross between *Cavia rufescens* and the Guinea-pig.''

K. Foot and E. C. Strobell (New York City): ''Results of Crossing Two Hemipterous Species with Reference to the Inheritance of an Exclusively Male Character, and its Bearing on Modern Chromosome Theories.''

H. K. Hayes (Connecticut Agricultural Experiment Station): ''The Inheritance of Certain Quantitative Characters in Tobacco.''

The annual dinner of the society was held on the evening of January 2, at the Colonial Hotel, one hundred and twenty-four being present. The president's address by Professor E. G. Conklin, on ''Heredity and Responsibility,'' was published in SCIENCE for January 10.

The following new members were elected: Helen D. King, Wistar Institute; Lewis R. Cary, Princeton University; E. Newton Harvey, Princeton University; Ethel M. Browne, Princeton University; Aute Richards, University of Texas; Otto F. Kampmeier, University of Pittsburgh; C. G. Crampton, Massachusetts Agricultural College, Amherst, Mass.; H. F. Roberts, Manhattan, Kan-

sas; F. W. Bancroft, Rockefeller Institute; Caswell Grave, Johns Hopkins University, and H. L. Wieman, University of Cincinnati.

The following officers were elected for 1913:

President—Ross G. Harrison, Yale University.

Vice-president—E. M. East, Harvard University.

Secretary—B. M. Davis, University of Pennsylvania.

Treasurer—J. Arthur Harris, Station for Experimental Evolution, Cold Spring Harbor.

Additional Members of the Executive Committee —A. P. Mathews, University of Chicago, and A. L. Treadwell, Vassar College.

<div style="text-align:right">A. L. TREADWELL,
Secretary for 1912</div>

THE AMERICAN MATHEMATICAL SOCIETY

THE nineteenth annual meeting of the American Mathematical Society was held at Cleveland, Ohio, in affiliation with the American Association for the Advancement of Science, on Tuesday–Thursday, December 31–January 2. The usual winter meeting of the Chicago Section was merged in this annual meeting. Separate sessions of the society were held on Tuesday morning, Wednesday morning and afternoon and Thursday morning. On Tuesday afternoon there was a joint meeting of the society with Sections A and B of the American Association, the Astronomical and Astrophysical Society of America and the American Physical Society. At this joint meeting the following papers were read:

E. B. Frost, vice-presidential address, Section A: ''The spectroscopic determination of stellar velocities, considered practically.''

R. A. Millikan, vice-presidential address, Section B: ''Unitary theories in physics.''

A. G. Webster: ''Henri Poincaré as a mathematical physicist.''

E. J. Wilczynski: ''Some general aspects of modern geometry.''

L. A. Bauer: ''Cosmical magnetic fields.''

G. E. Hale: ''Preliminary note on an attempt to detect the general magnetic field of the sun.''

The attendance at the several sessions of the society included sixty-two members. The chair was occupied in succession by Professors E. W. Davis, E. H. Moore, G. A. Bliss, and after the annual election by the president-elect, Professor E. B. Van Vleck. The following new members were elected: E. W. Chittenden, University of Illinois; C. S. Cox, Mulberry, Fla.; S. D. Killam, University of Rochester; J. T. Rorer, Philadelphia, Pa.; R. M.

Winger, University of Illinois. Sixteen applications for membership were received.

At the annual election, which closed on Thursday morning, the following officers and other members of the council were chosen:

President—E. B. Van Vleck.
Vice-president—M. W. Haskell, B. O. Peirce.
Secretary—F. N. Cole.
Treasurer—J. H. Tanner.
Librarian—D. E. Smith.
Committee of Publication—F. N. Cole, E. W. Brown, Virgil Snyder.
Members of the Council—F. C. Ferry, W. B. Ford, R. C. Maclaurin, Jacob Westlund.

The treasurer's report shows a balance of $9,684.92, including the life membership fund of $4,483.69. Sales of publications during the year amounted to $1,730.94. The total membership of the society is now 680, including 64 life members. The total attendance of members at all meetings during the past year was 336, the number of papers presented 179. The library shows a marked growth, the number of catalogued volumes being now 4,560. Much of the increase is due to the generous gifts of several hundred volumes by Dr. Emory McClintock and Dr. G. W. Hill, ex-presidents of the society.

The following papers were read at this meeting:

R. D. Carmichael: "On the numerical factors of the arithmetic forms $a^n \pm \beta^n$."

R. D. Carmichael: "On non-homogeneous linear equations with an infinite number of variables."

R. D. Carmichael: "Note on Fermat's last theorem."

W. A. Hurwitz: "Mixed linear integral equations of the first order."

H. Galajikian: "On certain non-linear integral equations."

W. A. Hurwitz: "On Green's theorem for the plane."

Arnold Emch: "On some properties of closed continuous curves."

G. A. Miller: "The product of two or more groups."

J. E. Rowe: "Three or more rational curves in collinear relation."

F. R. Sharpe and F. M. Morgan: "Quartic surfaces invariant under periodic transformations."

H. M. Sheffer: "A set of postulates for the Boolean algebra."

J. R. Conner: "The rational sextic curve and the Cayley symmetroid."

J. R. Conner: "Multiple correspondences determined by the rational space septimic."

L. E. Dickson: "Finiteness of the odd perfect and primitive abundant numbers with a given number of distinct prime factors."

L. E. Dickson: "Amicable number triples."

J. L. Coolidge: "A study of the circle-cross."

G. A. Bliss: "The relation satisfied by two dependent functions near a point at which both are singular."

J. A. Eiesland: "On the algebraic curves of a tetrahedral complex and the corresponding surfaces conjugate to it."

E. H. Moore: "On nowhere negative kernels."

Daniel Buchanan: "Oscillations near one of the isosceles triangular solutions of the three-body problem."

Peter Field: "On constrained motion."

G. C. Evans: "On the reduction of certain types of integro-differential equations."

J. A. Caparo: "Hyperspace and the non-euclidean geometry of four dimensions."

Jacob Westlund: "On the factorization of rational primes in cubic cyclotomic number fields."

E. L. Dodd: "An erroneous application of Bayes's theorem to the set of real numbers."

E. L. Dodd: "The validity of Bertrand's approximation leading to the probability integral."

Edward Kasner: "Equitangential trajectories in space."

C. J. Keyser: "Concerning multiple interpretations of postulate systems and the 'existence' of hyperspaces."

E. J. Wilczynski: "On a certain completely integrable system of linear partial differential equations."

L. C. Karpinski: "Algebra in the Quadripartitum numerorum of Johannes de Muris."

L. C. Karpinski: "Hindu numerals among the Arabs."

H. B. Phillips: "Directed integration."

Joseph Lipke: "Geometric characterization of isogonal trajectories on a surface."

J. B. Shaw: "Integral invariants of general vector analysis."

J. B. Shaw: "On non-linear algebras."

D. R. Curtiss: "Proofs of certain formulas suggested by Laguerre's work in the theory of equations."

Arthur Ranum: "On the projective differential classification of n-dimensional spreads generated by ∞^1 flats."

I. M. Schottenfels: "Proof that there is but one simple group of order 7!/2."

L. P. Eisenhart: "Certain continuous deformations of surfaces applicable to quadrics."

E. V. Huntington: "A set of independent postulates for 'betweenness.'"

A. B. Frizell: "Some terms in the expansion of the infinite determinant."

T. H. Gronwall: "On Weierstrass's preparation theorem."

T. H. Gronwall: "On series of spherical harmonics (second paper)."

Cora B. Hennel: "Transformations and invariants connected with linear homogeneous difference equations and other functional equations."

Harris Hancock: "Problems in arithmetical geometry."

Harris Hancock: "Generalization of a theorem due to Liouville or to Dedekind, with applications to the geometry of numbers."

W. D. MacMillan: "A proof of Wilczynski's theorem."

W. D. MacMillan: "On Poincaré's correction to Bruns's theorem."

W. B. Fite: ''Some theorems concerning groups whose orders are powers of a prime.''

L. L. Smail: ''Some generalizations in the theory of summable divergent series.''

C. E. Love: ''On the asymptotic solutions of linear differential equations.''

Virgil Snyder: ''Algebraic surfaces invariant under an infinite discontinuous group of birational transformations (second paper).''

L. L. Silverman: ''On the equivalence of definitions of summability.''

R. M. Winger: ''Self-projective rational curves of the fourth and fifth order.''

The next meeting of the society will be held at Columbia University on Saturday, February 22.

F. N. Cole,
Secretary

THE OHIO ACADEMY OF SCIENCE

The twenty-second annual meeting of the Ohio Academy was held at Ohio State University, Columbus, O., on November 28, 29 and 30, the president of the society, Professor Bruce Fink, of Miami University, presiding. On Thursday evening an informal reception was given at the Ohio Union Club, where assignment of rooms were made to the visiting members, and a pleasant social period was thoroughly enjoyed by all. The sessions on Friday and Saturday were in the general lecture room of the Physics Building.

The address of President Fink on ''Botanical Instruction in Colleges'' occurred at 1:30 P.M., Friday, while the evening was given up to a dinner and smoker.

The complete program follows:

''New and Rare Plants added to the Ohio List in 1912,'' J. H. Schaffner.

''Some Applications of Biometry to Agricultural Problems,'' A. G. McCall.

''The Influence of Topography on Bird Migrations,'' Lynds Jones.

''Experiments in Fertilization,'' R. A. Budington.

''Heredity (Eugenics),'' W. F. Mercer.

''The Ohio Biological Survey,'' Herbert Osborn.

''Notes on some Rare Ohio Mosses,'' Clara G. Marks.

''Effect of Road Oil on Rubber Tires,'' Errol L. Fox and Chas. P. Fox.

''Notes on Ohio Oaks,'' W. R. Lazenby.

''The Mississippian-Pennsylvanian Unconformity and the Sharon Conglomerate,'' G. F. Lamb.

''The Primary Motor Column of the Central Nervous System of *Amblystoma* and its Relation to the Motor Nerves,'' C. E. Coghill.

''Note on the Tactile Reactions of some Orb-weaving Spiders in their Webs,'' W. M. Barrows.

''*Balanoglossus* and the Origin of the Central Nerve Tube in Vertebrates,'' M. M. Metcalf.

''Additions to the Cedar Point Flora,'' E. L. Fullmer.

''Seeds and Seedling of some Forest Trees,'' W. R. Lazenby.

''Lorain County Myxomycetes,'' F. O. Grover.

''The Cerebral Ganglia of the Frog Tadpole,'' F. L. Landacre and Marie F. McLellan.

''An Ancient Lake in Ohio with Unlevel Shorelines,'' Geo. D. Hubbard.

''Terraces associated with the Terminal Moraine near Delafield, Wisconsin,'' C. G. Shatzer.

''An Ecological Study of Forest Types near Columbus,'' F. B. H. Brown.

''Algæ of Lorain County, Ohio, with Notes on their Distribution,'' Susan P. Nichols.

''Yerba Mate (Paraguay Tea),'' Chas. P. Fox.

''Mississippian Conglomerates in Northern Ohio,'' G. F. Lamb.

''Charts illustrating Feeble-mindedness,'' W. F. Mercer.

''A Supernumerary Appendage in *Otocryptops sexspinosus*, and a Theory of Heterorhythmic Development,'' L. B. Walton.

''The Soaring Flight of Birds,'' Lynds Jones.

''The Aquarium at the Naples Station,'' Stephen R. Williams.

''Geography of the Balkan Peninsula'' (lantern slides), N. M. Fenneman.

''A Botanical Survey of the Sugar Grove Region'' (lantern slides), Robert Griggs.

''The Fauna of the Conemaugh Formation,'' Clara G. Marks.

''A Preliminary Report on the Crayfishes of Ohio,'' C. I. Turner.

''Induced Modifications in the Pigment Development of Spelerpes Larvæ,'' A. M. Banta.

''Review of the Genus *Dero* (Aquatic Oligochates) with a Description of Two New Species,'' L. B. Walton.

''The Composition of a Typical Prairie,'' J. H. Schaffner.

''A List of Plants Collected in Cuyahoga County and New to the County or to Ohio,'' Edo Claassen.

''The Effects of Changes in Sea Beds on the Fauna and Lithology of the Richmond Period,'' G. M. Austin.

''The Application of Physics to Agriculture,'' A. G. McCall.