

## SPECIAL ARTICLES

THE ROOT-ROT DISEASE OF THE APPLE  
IN VIRGINIA

AN unusually destructive rotting of the roots of apple trees is prevalent in the chief orchard sections of Virginia. The infectiousness of this condition is shown in the death of adjoining trees in groups of considerable numbers irrespective of soil conditions or topography and the death of replants set in holes from which rotted trees were removed.

The symptoms of this disease have been known for some time, but the causative organism has not been determined.

Isolations from diseased roots by the writers from a number of orchards in the "Valley" and "Piedmont" sections of the state have yielded cultures of an imperfect fungus which appears to be the conidial stage of a species of *Xylaria*. Inoculations made from pure culture of these isolations into bark wounds of living apple roots in both damp chambers and in the field have produced typical rotting of the bark and wood, and the introduced fungus has been obtained in pure culture from the margins of these infected portions.

Recently perithecial stromata of *Xylaria polymorpha* (Pers.) Grev. have been found on roots of apple trees in various stages of typical root-rot attack and on the stumps of several deciduous trees in a small patch of woodland immediately adjoining the orchard in question. Cultures obtained from germinated ascospores of this fungus are being used for additional inoculations into apple roots.

Pending the results of these inoculations, it seems reasonably certain that a species of *Xylaria* is responsible for the root-rot disease of the apple in Virginia. It is possible that more than one species of *Xylaria* is involved, since certain constant cultural distinctions exist between some of the isolations; these, however, may be varietal rather than specific.

Apparently all varieties of the apple are susceptible and probably equally so. Observations indicate that the disease may be spread in cultivation or in the removal of borers, in contact between roots systems of diseased and

healthy trees, and by surface washing of spores or other infective material.

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THE AMERICAN MATHEMATICAL  
SOCIETY

THE twenty-third annual meeting of the American Mathematical Society, which was held at Columbia University on Wednesday and Thursday, December 27-28, 1916, was in several respects an exceptional occasion. It took place in the midst of the convocation week series of meetings of the American Association for the Advancement of Science and its long train of affiliated societies, and was immediately followed by the second annual meeting of the newly organized Mathematical Association of America, with which the society has not only a large common membership, but also a general community of interest highly beneficial to both. The annual meeting is always one of the largest of the year, being the season of the election of officers and other members of the council and the transaction of important business. This year it was especially marked by the delivery of the retiring address of President E. W. Brown, of Yale University, who chose as his subject "The relations of mathematics to the natural sciences." This was presented before a joint session of the American Mathematical Society, the Mathematical Association of America, the American Astronomical Society, and Section A of the American Association, and was followed by the retiring address of Vice-president A. O. Leuschner, of Section A, on "Derivation of orbits—theory and practice." A joint dinner of four organizations was held on Thursday evening at the Park Avenue Hotel, with an attendance of 143 members and friends. Much of the credit for the great success of the meetings is due to the joint committee on arrangements and to the program committees of the Mathematical Association.

Under all these favorable circumstances the attendance at the four sessions of the society exceeded all previous records, the number of members present being 131. President Brown occupied the chair, being relieved by Vice-presidents Hedrick and Snyder and Professor G. D. Olds. The council announced the election of the following persons to membership in the society: Professor H. H. Conwell, University of Idaho; Mr. Robert

Dysart, Boston, Mass.; Dr. Mary G. Haseman, Johns Hopkins University; Mr. J. B. Scarborough, North Carolina Agricultural and Mechanical College; Mr. J. J. Tanzola, U. S. Naval Academy. Ten applications for membership in the society were received.

In response to an invitation received from the department of mathematics of the University of Chicago, it was decided to hold the summer meeting and colloquium of the society at that university in 1919. Committees were appointed to arrange for the summer meeting of 1917 and to publish the Cambridge Colloquium Lectures, which will probably appear in the early summer.

The total membership of the society is now 732, including 75 life members; the annual published list will be issued in January. The total attendance of members at all meetings, including sectional meetings, during the past year was 490; the number of papers read was 205. The number of members attending at least one meeting during the year was 278. At the annual meeting 235 votes were cast. The treasurer's report shows a balance of \$10,198.38, including the life membership fund of \$6,039.87. Sales of the society's publications during the year amounted to \$1,434.28. The library now contains about 5,377 volumes, excluding unbound dissertations.

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

*President:* L. E. Dickson.

*Vice-presidents:* A. B. Coble, E. B. Wilson.

*Secretary:* F. N. Cole.

*Treasurer:* J. H. Tanner.

*Librarian:* D. E. Smith.

*Committee of Publication:* F. N. Cole, Virgil Snyder, J. W. Young.

*Members of the Council to serve until December 1919:* G. C. Evans, L. A. Howland, G. H. Ling, R. L. Moore.

The following papers were read at this meeting:

J. E. Rowe: "The relation of singularities of the rational quintic in space to loci of the rational plane quintic."

C. A. Fischer: "Linear functionals of  $n$ -spreads."

H. B. Mitchell: "Geometrical limits for the imaginary roots of a polynomial with real coefficients."

Arnold Emch: "A theorem on the curves described by a spherical pendulum."

J. K. Whittemore: "Spiral minimal surfaces."

J. R. Kline: "Concerning the complements of countable infinities of point sets of certain types."

L. L. Dines: "On projective transformations in function space."

C. C. Grove: "Foundation of the correlation coefficient."

O. E. Glenn: "Preliminary report on invariant systems belonging to domains."

Norbert Wiener: "Certain formal invariances in Boolean algebras."

L. P. Eisenhart: "Theory of transformations  $T$  of conjugate systems."

E. V. Huntington: "Complete existential theory of the postulates for serial order."

E. V. Huntington: "Complete existential theory of postulates for well-ordered sets."

Daniel Buchanan: "Orbits asymptotic to an isosceles-triangle solution of the problem of three bodies."

Daniel Buchanan: "Asymptotic satellites about the straight-line equilibrium points."

Daniel Buchanan: "Asymptotic satellites about the equilateral-triangle equilibrium points."

G. M. Green: "Isothermal nets on a curved surface."

A. L. Miller: "Systems of pencils of lines in ordinary space."

W. L. Hart: "On an infinite system of ordinary differential equations."

W. L. Hart: "Linear differential equations in infinitely many variables."

E. V. Huntington: "A set of independent postulates for cyclic order."

E. V. Huntington: "Sets of independent postulates for order on a closed line."

Frank Morley: "The cubic seven-point and the Lüroth quartic."

J. L. Coolidge: "The intersections of a straight line and hyperquadric."

A. D. Pitcher: "Biextremal connected sets."

H. H. Mitchell: "Proof that certain ideals in a cyclotomic realm are principal ideals."

H. H. Mitchell: "On the asymptotic value of sums of power residues."

Edward Kasner: "Certain systems of curves connected with the theory of heat."

Teresa Cohen: "On a concomitant curve of the planar quartic."

P. F. Smith: "A theorem for space analogous to Cesàro's theorem for plane isogonal systems."

W. E. Story: "Some variable three-term scales of relation."

E. W. Brown, Presidential address: "The relations of mathematics to the natural sciences."

A. O. Leuschner, Vice-presidential address, Section A: "Derivation of orbits—theory and practice."

G. D. Birkhoff: "A class of series allied to Fourier's series."

G. D. Birkhoff: "Note on linear difference equations."

G. A. Miller: "Groups generated by two operators of the same prime order such that the conjugates of the one under the other are commutative."

H. S. Vandiver: "On the power characters of units in a cyclotomic field."

Henry Taber: "On the structure of finite continuous groups."

The San Francisco Section of the society held its twenty-eighth regular meeting at the University of California on November 25. The Southwestern Section held its tenth regular meeting at the University of Kansas on December 2. The seventh regular meeting of the society at Chicago was held on December 22-23. The next meeting of the society will be held at Columbia University on February 24.

F. N. COLE,  
*Secretary*

### THE AMERICAN GENETIC ASSOCIATION

THE thirteenth annual meeting of the association was held at Columbia University, December 26-28, with an attendance of about 200. In the presidential address on "The Importance of Photographs in Presenting Genetic Discoveries," Dr. David Fairchild insisted that men of science should take more pains properly to record the results of their investigations by photographs; that such photographs as are commonly published are too small and also fail to make the desired impression because too little allowance is made for the reader's point of view. He showed lantern slides to illustrate his remarks.

Professor E. E. Barker, of Cornell University, presented the results of a questionnaire sent to American colleges, which showed great diversity in the amount of attention given to genetics, and the side from which it is approached.

In discussing "The Biological Significance of Death" Professor F. H. Pike, of the College of Physicians and Surgeons, Columbia University, referred to the independence of the environment which higher forms of life have attained, mainly through the property of regulation. This independence has made differentiation possible, but the individual has also become incapable of any great change. If evolution is to take place, it must then depend on the variations accompanying the production of new individuals. The immortal-

ity of the older forms would produce a congestion of the earth which would seriously interfere with the development of the newer. Death is therefore to be regarded as an adaptation, as Weismann supposed, which furthers evolution.

"The Constructive Aspect of Birth-Control" was discussed by Professor Robert J. Sprague, of Massachusetts Agricultural College. He observed that birth-control is only a part of the larger problem of population; that the poorer classes need to practise more birth-control but the more efficient classes need to practise distinctly less than they do at present, if the race is to evolve progressively. A constructive program of economic and social changes, which would help to make fecundity correlated with eugenic value, was outlined.

Professor W. S. Anderson, of the University of Kentucky, spoke on "Some Difficulties in Breeding Blooded Stock." The production of blooded horses is particularly hindered by the infertility of brood mares, which in different parts of Kentucky runs from 35 per cent. to 65 per cent. Investigation has proved that the difficulty usually is to be found in the mare, rarely in the stallion, and by hygienic measures the fertility of mares on the Patchen Wilkes stock farm has been doubled. Selection of fecund strains is believed, however, to be necessary for complete removal of the difficulty of infertility.

As chairman of the committee on research in eugenics, Dr. Frederick Adams Woods, of the Massachusetts Institute of Technology, presided at the second meeting and read a paper on "Significant Evidence for Mental Heredity." Much of the evidence commonly cited he believes to be worthless, but by measurements of differences it is possible to get acceptable proof. Studies of twins by Galton and Thorndike, and those of the royal families of Europe by the speaker himself, were cited. Princes who inherited thrones were not found to be more conspicuous mentally than their younger brothers, despite the greater chance which a monarch has for displaying any valuable traits he may possess. Moreover, eminent men are found to be as much interrelated in America as in Europe, although it is popularly supposed that superior opportunities and free competition in a newer country make family connections of less value. The fact that eminent men are found, despite this, to be much interrelated indicates that their mental differences are germinal and not solely the result of educational and social influences.

Mary L. Read, director of the School of Mothercraft, New York City, had the topic "Eugenics