

It is in the instructor's manual, likewise, that the spirit of the author's laboratory methods comes more clearly to the foreground. The presentation is more intimate, the descriptions more comprehensive, and the insight into the training which the course is intended to give more manifest. The genial set of instructions headed 'How to Fail in Laboratory Work,' might serve a good purpose if prominently exhibited in the laboratory. But the main point to be noted is the thorough appreciation of the fact that the psychological experiment carries with it its own conditions and peculiarities; that in becoming a 'subject' the individual retains all his peculiarities; and that these must be dealt with by tact and resource. The difference between good and bad observation upon mental matters depends upon this, almost equally with the acquaintance with method and technique. Both for the method and the matter, these volumes and the two to follow must be valued as amongst the most important of recent contributions to the furtherance of the aims of experimental psychology.

JOSEPH JASTROW.

*Peach Leaf Curl: Its Nature and Treatment.* By NEWTON B. PIERCE, in charge Pacific Coast Laboratory, Santa Anna, California. Bulletin No. 20, Division of Vegetable Physiology and Pathology, U. S. Department of Agriculture. Washington, Government Printing Office. 1900. Pages 1-204; plates I.-XXX.

A carefully detailed and exhaustive account of the geographical distribution, history, horticulture, botany and pathology of this destructive disease, and of experiments with the various remedies, methods and appliances for treating it. The most important of the conclusions is that very large percentages of the injuries due to the parasitic fungus *Exoascus deformans* are not caused by the renewed growth of perennial mycelium, but are the result of new infections occurring in early spring, and thus preventable by spraying the still unopened buds with Bordeaux mixture or other fungicides. Previous failures with such treatments are explained by the fact that the remedy was applied after the pathogenic organism had hidden itself in the tissues of its host.

As the annual losses from leaf curl in the United States are estimated at \$3,000,000, the determination of these simple points is of great economic importance, and also of the widest interest, since this disease, unlike the yellows, extends to all regions where the peach is cultivated.

#### BOOKS RECEIVED.

*Select Methods of Food Analysis.* HENRY LEFFMANN and WILLIAM BEAM. Philadelphia, P. Blakiston's Son & Co. 1901. Pp. viii + 383. \$2.50.

*L'évolution du pigment.* G. BOHN. Paris, G. Carré and C. Naud. 1901. Pp. 96. 2 fr.

*Towers and Tanks for Water Works.* J. N. HAZLEHURST. New York, John Wiley & Sons; London, Chapman & Hall. 1901. Pp. ix + 126.

#### SOCIETIES AND ACADEMIES.

##### AMERICAN MATHEMATICAL SOCIETY.

A REGULAR meeting of the American Mathematical Society was held at Columbia University, New York City, on Saturday, April 27, 1901. About thirty-five persons attended the two sessions. Vice-President Thomas S. Fiske occupied the chair. The following persons were elected to membership: Mr. C. W. McG. Black, Yale University; Dr. S. E. Slocum, University of Cincinnati. Two applications for membership were received.

To relieve the increasing burden of administration, the office of Assistant Secretary was created and filled by the appointment of Dr. Edward Kasner, to serve until February, 1902.

The library of the Society, which at present consists mainly of some five hundred unbound volumes of journals received as exchanges, is about to be deposited in the library of Columbia University, under an agreement by which the University undertakes to bind, catalogue and care for the books now on hand and all future additions, and to make them easily accessible to the members of the Society. Arrangements will be made by which the books may be temporarily loaned to members living at a distance. The library is to be kept as a separate collection, duplicating as far as may be the general University library, and aiming to become as complete as possible in itself. The title to the books remains in the Society, which reserves

the right to withdraw them under agreed conditions.

The following papers were presented at this meeting:

Dr. W. A. GRANVILLE: 'Invariants of some  $m$ -gons under certain projective Lie groups in the plane.'

Dr. EDWARD KASNER: 'The algebraic potential surfaces.'

Professor F. MORLEY: 'On the real foci of algebraic curves.'

Mr. GEORGE PIERCE: 'A curious approximate construction for  $\pi$ .'

Professor E. W. HYDE: 'On a surface of the sixth order which is touched by all screws belonging to a three-conditioned system.'

Professor L. E. DICKSON: 'The hyper-orthogonal groups.'

Professor E. W. BROWN: 'On least action and minimal surfaces.'

Professor W. H. METZLER: 'On certain aggregates of determinant minors.'

Professor E. B. VAN VLECK: 'On the convergence of continued fractions in the complex elements; supplementary note.'

Professor W. F. OSGOOD: 'On a fundamental property of a minimum in the calculus of variations.'

Professor E. O. LOVETT: 'The geometry of quadrics.'

Professor E. O. LOVETT: 'The differential geometry of  $n$ -dimensional space.'

Dr. G. A. MILLER: 'On the groups generated by two operators.'

Dr. EDWARD KASNER: 'The relations between the angles of any number of lines in  $n$ -space.'

Dr. L. P. EISENHART: 'Isothermal conjugate systems of lines on surfaces.'

Dr. E. J. WILCZYNSKI: 'Geometry of a simultaneous system of two linear homogeneous differential equations of the second order.'

Dr. H. F. BLICHFELDT: 'A new determination of the primitive continuous groups in two variables.'

The summer meeting and colloquium of the Society will be held at Cornell University, Ithaca, N. Y., beginning August 19, 1901, and extending over a week.

EDWARD KASNER,  
*Assistant Secretary.*

ZOOLOGICAL JOURNAL CLUB OF THE  
UNIVERSITY OF MICHIGAN.

At the meeting of January 17th, Professor Jacob Reighard gave a paper on 'The Behavior of Plankton Nets.' This was based on plankton

work done on Lake Erie in 1899 and 1900, in company with Professor H. B. Ward, under the auspices of the United States Fish Commission. The amount of water strained by the nets was directly measured by the use of a meter. It was thus possible to determine accurately the coefficient of the nets under various conditions, to judge as to their constancy, and to decide as to the correctness of the coefficients calculated by other investigators. The results have a fundamental bearing on the worth of all plankton work hitherto done; details will be published in a paper now under preparation.

January 24th, Mr. Raymond Pearl gave an account of work on the 'Electrotaxis of Infusoria.' The paper was accompanied by demonstrations with the projection apparatus. The following demonstrations were given:

1. The reactions of *Paramecium* to the current. The orientation and movement toward the kathode in a weak current were first shown. Then by a gradual increase in the intensity of the current the speed of swimming was made to decrease, and in a very strong current the characteristic changes in body form were seen to occur.

2. The reactions of a species of *Oxytricha*, one of the *Hypotricha*. It was seen that on making the current a part of the animals immediately oriented and went toward the kathode, while others swam in an oblique direction more or less transverse to the current. Attention was called to the fact that during the transverse swimming the animal often jerked sharply to one side, the direction of this jerk always being the same—that is, toward the right side of the organism. It was shown that by this process of frequently jerking toward the right side while swimming obliquely, orientation with the anterior end toward the kathode was ultimately brought about. It was pointed out that the reason why a part of the animals oriented at once, while others did so only in the indirect way thus described, was owing to the different position of the axes of the body with reference to the anode and kathode at the time of making the current. When the long axis of the body was transverse to the direction of the current and the oral side was toward the kathode, the transverse or oblique swimming

occurred, while from all other positions immediate and direct orientation with anterior end toward the kathode followed the closing of the circuit. On reversing the current, it was seen that the animals always gained the new orientation with anterior end to the new kathode by turning to the *right*. The fact was shown that sudden breaking (as well as reversal) of the current always caused the typical motor reflex that is given by the organism as a response to stimuli of other sorts—the animal always turning to its right.

3. The kataphoric effect of currents of moderate intensity in carrying *Chilomonas* and suspended particles in the water toward the anode was shown.

Following the demonstrations an account was given of the electrotactic reaction of a number of infusoria, and the bearing of the results on the recent work of other investigators was discussed. Reference was made to the reactions of some of the lower Metazoa which resemble in many ways the reactions of the infusoria.

H. S. JENNINGS,  
Secretary.

#### DISCUSSION AND CORRESPONDENCE.

##### CORRECTION TO ANDRÉ'S ASTRONOMIE STELLAIRE.

THE favorable notice of André's 'Traité d'astronomie stellaire' contained in the number of SCIENCE for April 19, 1901, leads me to call attention to the following curious error contained in that work, which appears to have escaped the notice of all its reviewers.

In Vol. I., § 225, the author seeks to account for the well-known fact of a progressive variation in the periodic time—interval from minimum to minimum—of certain variable stars, and resorting to the hypothesis of a uniform

motion in the line of sight, he proceeds by elementary mathematical methods to derive the effect of this motion in altering the periodic time of the light variations. It is almost self-evident that the effect of this motion is to produce a small but constant difference between the true period, and that furnished by observation, and this result is confirmed by the author's analysis when properly executed. But at the equation marked (2) in the text, André commits the algebraic error of dividing two terms of his equation by a certain factor,  $n' - n$ , while neglecting to divide the third term and obtains thereby an erroneous result which he interprets, correctly enough so far as the equation itself is concerned, as showing that the star's radial velocity produces a progressive change in the periodic time of its light variations. He applies this equation to certain well-known variables having secular terms in their light equations, and derives from purely photometric data, numerical values for their motion in the line of sight, which, although plausible enough in respect of magnitude, are entirely wrong in principle. The entire section entitled 'Terme séculaire' should be suppressed since it is completely vitiated by the algebraic error noted above.

GEORGE C. COMSTOCK.

##### AN APPEAL FOR COOPERATION IN MAGNETIC AND ALLIED OBSERVATIONS DURING THE TOTAL SOLAR ECLIPSE, MAY 17-18, 1901.

To further test the results obtained by the United States Coast and Geodetic Survey during the total solar eclipse of May 28, 1900, arrangements are being made for obtaining simultaneous observations of the magnetic elements and of allied phenomena over the entire globe during the next total solar eclipse, May 17-18, 1901.\*

##### \* CIRCUMSTANCES OF THE ECLIPSE.

|                         | Greenwich Mean Time. |       |       |    | Longitude from Gr. | Latitude.    |
|-------------------------|----------------------|-------|-------|----|--------------------|--------------|
| Eclipse begins          | May 17 d.            | 14 h. | 59 m. | .9 | 51° 34'.4 E.       | 20° 21'.9 S. |
| Central eclipse begins  | 17                   | 15    | 57    | .6 | 40 11.2 E.         | 27 27.6 S.   |
| Central eclipse at noon | 17                   | 17    | 28    | .8 | 96 51.9 E.         | 2 07.1 S.    |
| Central eclipse ends    | 17                   | 19    | 10    | .2 | 156 53.6 E.        | 12 49.0 S.   |
| Eclipse ends            | 17                   | 20    | 07    | .9 | 145 04.5 E.        | 5 38.0 S.    |