The following papers were read at this meeting.

I. J. SCHWATT: ' On the length of curves.'

T. J. I'A. BROMWICH: ' Similar conics through three points.'

D. R. CURTISS: ' Binary families in a triply connected region, with especial reference to hypergeometric families.'

JOHN EIESLAND: ' On a certain system of conjugate lines on a surface transformable into asymptotic lines by means of Euler's transformation.'

EDWARD KASNER: ' A class of conformal transformations.'

EDWARD KASNER: ' Notes in the theory of surfaces.'

E. R. HEDRICK: ' Note on the existence of a continuous first derivative.'

G. A. BLISS: ' Jacobi's condition in the calculus of variations when both end points are variable.'

ARNOLD EMCH: ' Note on the p-discriminant of ordinary differential equations of the first order.'

HELEN A. MERRILL: ' On a notable class of linear differential equations of the second order.'

FLORIAN CAJORI: ' On the circle of convergence of the powers of a power series ' (preliminary communication).

E. T. WHITTAKER: ' An expression of certain known functions as generalized hypergeometric functions.'

W. H. YOUNG: ' On a test for non-uniform convergence.'

J. I. HUTCHINSON: ' On the automorphic functions of signature $(0, 3; 2, 6, 6)$.'

B. O. PEIRCE: ' On the lines of certain classes of solenoidal or lamellar vectors symmetric with respect to an axis.'

H. T. EDDY: ' The multiplication of complex numbers and of vectors compared.'

J. N. VAN DER VRIES: ' On monoids.'

JACOB WESTLUND: ' On the congruence $x\phi(P) \equiv 1$ mod. P^n.'

ALFRED LOEWY: ' Zur Gruppentheorie mit Anwendungen auf die Theorie der linearen homogenen Differentialgleichungen.'

SAUL EPSTEEN: ' Semireducible hypercomplex number systems.'

L. E. DICKSON: ' On the subgroups of order a power of p in the quaternary abelian group in the Galois field of order p^n.'

L. E. DICKSON: ' The subgroups of order a power of 2 of the simple quinary orthogonal group in the Galois field of order $p_n = 8l \pm 3$.'

L. E. DICKSON: ' Determination of all groups of binary linear substitutions with integral coefficients taken modulo 3 and of determinant unity.'

L. E. DICKSON: ' Determination of all the subgroups of the known simple group of order 25920.'

L. E. DICKSON: ' The systems of subgroups of the quaternary abelian group in a general Galois field.'

C. N. HASKINS: ' On the invariants of quadratic differential forms.'

FRANK MORLEY: ' On projective coordinates.'

FRANK MORLEY: ' On a skew quadrangle covariant with six points of space ' (preliminary communication).

E. B. WILSON: ' The projective definition of area.'

R. S. WOODWARD: ' On the values of the stretches and the slides in the theory of strain.'

R. S. WOODWARD: ' The radial compressibility of the earth compatible with the Laplacian law of density distribution.'

E. O. LOVETT: ' Periodic solutions of the problem of four bodies.'

E. O. LOVETT: ' Central conservative systems with prescribed trajectories.'

S. E. SLOCUM: ' Rational formulas for the strength of concrete-steel beams.'

A. S. CHESSIN: ' On a class of linear differential equations.'

C. M. MASON: ' On certain systems of differential equations: generalization of Green's functions, analytic character of the solutions.'

E. V. HUNTINGTON: ' A set of independent postulates for the algebra of logic.'

Pleasant social features of the meeting were the reception tendered to the society by Professor and Mrs. Pickering, at the Harvard College Observatory, where the rich collection of stellar photographs was visited under Professor Pickering's guidance; several informal and well-attended dinners and evening gatherings; and on Thursday afternoon an excursion to Nantasket in Boston harbor.

The next meeting of the society will be held at Columbia University, on Saturday, October 31. F. N. COLE,
Secretary.

DISCUSSION AND CORRESPONDENCE.

TOXIC EFFECT OF ACIDS ON SEEDLINGS.

IN a recent number of SCIENCE (Vol. XVIII., p. 453, September 4, 1903) there is a communication describing the effect of solutions of certain bases and acids upon seedlings

of Indian corn. This paper is remarkable in that no mention is made of the previous work of Heald* upon this plant, although the work of Kahlenberg and True, suggesting Heald's work, and published at the same time, in the same journal,† is freely quoted. This omission is the more remarkable since the author's results, when working with acids, are widely different from those obtained by Heald. The undersigned, in collaboration with Mr. J. F. Breazeale, had occasion last winter to repeat the work of Heald, working to closer limits than that investigator had found desirable. It may be worth while to state the results of these three investigations as to the limit of dilution for various acids with seedlings of corn.

	Loew.	Heald.	Cameron and Breazeale.
Hydrochloric acid..	n/512	n/3,200	n/3,000.
Sulphuric acid.....	n/512	n/3,200	n/3,000.
Nitric acid........		n/3,200	n/2,250.
Hydrobromic acid..		n/3,200	
Acetic acid........		n/400 ‡	n/850.
Malic acid........			n/1,250.
Oxalic acid........			n/1,750.
Succinic acid......			n/600.

Just what is meant by 'toxic limit' seems to be somewhat indefinite judging from the printed descriptions of the work of this kind, but in the three investigations under consideration the same methods of work and the same, or very similar, criteria have been used, and the comparison seems to be fair. The confirmation of the results of Heald by those obtained in my own laboratory makes those of Loew the more inexplicable.

The author expresses astonishment that the limits for maize should vary so widely from that found for *Lupinus albus* by Kahlenberg and True. The work in my own laboratory, as well as that of Heald, has shown that very much greater differences exist when other plants are involved, and that *a priori* predications upon this point are at present impossible.

* *Bot. Gazette*, 22, 125 (1896).

† *Bot. Gazette*, 22, 81 (1896).

‡ So stated in Heald's tabulation, but from the description of his experiments it seems probable that this is a typographical slip, and should be n/800.

He also seems to have difficulty in understanding the relative action of kations in the presence of more toxic anions. The literature of this subject is now fairly large, as witness the work of Loeb in Chicago, Coupin in France, not to mention a number of other investigators, and this particular point has been specifically discussed in connection with agricultural plants by Kearney and myself,* and more recently by True and Gies,† although no reference is made to any of these investigations in the paper under discussion. It may be well to state here that the work done in my laboratory, which I have already communicated to the American Chemical Society at its meeting in Cleveland, Ohio, June 30, 1903, will be described shortly from a technical point of view in the *Journal of Physical Chemistry,* and its value for and bearing upon certain important agricultural questions will be fully discussed in an early publication from the Department of Agriculture. F. K. Cameron.

U. S. Dept. of Agriculture, Bureau of Soils,
Washington, D. C., September 7, 1903.

SHORTER ARTICLES.

PRIMITIVE FLAGEOLETS.

There is a kind of primitive flageolet made by the western tribes of North American Indians as follows: A section of cane is open at both ends, but has a joint between the ends; the septum of this joint closes the tube. Two holes from three sixteenths to one fourth of an inch in diameter are made from the outside into the cavity, close to and on opposite sides of the septum. A shallow air channel is cut in the outside of the cane from one hole to the other, and three, four or six finger holes are made in the cane in the part below the septum. The Rees and Shoshones make a septum of wax. When so constructed and nothing further added the 'mystery flute,' described by early writers, is completed when the upper of the two holes at the septum and the air channel are covered by a finger. Blowing through the cane from the upper end produces a sound whose pitch is changed by the finger holes.

* Report 71, U. S. Dept. of Agriculture (1902)

† *Torrey Botanical Club*, 30, 390 (1903).