tions for the attainment of characters predetermined by heredity." Bugnion,[3] studying *Eutermes lacustris* and *Termes Redemanni* Wasm. and *Horni* Wasm. states that the differentiation takes place during the embryo stage for the three castes, rather than undifferentiated larvæ being developed to the castes by the character of the food they receive.

Observations by the writer of molting soldier larvæ of *Leucotermes* spp. and *Termopsis angusticollis* Walk. show that the differentiation takes place during a "quiescent"[4] stage rather late in the life cycle. At this point a brief outline of the life cycle is necessary.

In the metamorphosis of the above species the eggs hatch into active, undifferentiated larvæ which develop to the various mature forms or castes by a gradual growth through a series of molts and quiescent stages. During the quiescent stage both the larvæ and nymphs pass through an inactive period, of comparatively short duration, isolated, lying on the side, head bent down to lie on the ventral side of the body along which the antennæ and legs also lie extended in a backward direction. The writer first observed molting larvæ in a quiescent stage on August 11, 1911, in a colony near Jerseyville, Illinois. During April, 1912, the development of nymphs of the first and second forms of *Leucotermes flavipes* Kol. and *virginicus* Banks was observed at Falls Church, Virginia, and it was noted that both these nymphs passed through a quiescent stage in the final molt to the reproductive forms; nymphs of *Termopsis angusticollis* Walk. also pass through this quiescent stage. From the first to the middle of August, 1913, freshly molted, pigmentless soldiers of *flavipes* in the stage preceding maturity were noticeable in colonies in Virginia. On August 17, 1913, molting soldier larvæ were found in the quiescent stage in a colony of *virginicus* at Chain Bridge, Virginia. During the quiescent stage differentiation took place. Larvæ to all external appearances undifferentiated or of the worker type (as shown by the head, the mandibles—with marginal teeth—and the labrum of the still adhering larval skin), the individuals (*virginicus*) being over 3 mm. in length in the quiescent condition, antennæ with 14 segments, develop at this molt to pigmentless nymphs of soldiers with more elongate, soldier-like head and saber-like mandibles, without marginal teeth. In this stage the head, mandibles, labrum and "menton" (Bugnion) have not attained the shape or length of those of the mature soldier, there being at least one later molt to maturity.

Therefore, it may be stated that in case of *Leucotermes* spp. and *Termopsis angusticollis* Walk., the differentiation of the soldier caste occurs during a molt and quiescent stage rather late in the life cycle of the insect, the larvæ being previously, to all external appearances, undifferentiated.

Thomas E. Snyder
Bureau of Entomology,
Branch of Forest Insects,
September 11, 1913

[3] Bugnion, Pr. E., "La différenciation des castes chez les Termites," *Bull. de la Société entomologique de France*, No. 8, April, 1913, pp. 213–18.

[4] Strickland, E. H., "A Quiescent Stage in the Development of *Termes flavipes* Kol.," *Journ. N. Y. Ent. Soc.*, Vol. XIX., No. 4, December, 1911, pp. 256–59.

## *THE AMERICAN MATHEMATICAL SOCIETY*

The twentieth summer meeting and seventh colloquium of the American Mathematical Society were held at the University of Wisconsin during the week September 8–13, 1913. The attendance, which exceeded that of any previous summer meeting of the society, included fifty-seven members. The four sessions of the summer meeting proper, for the presentation of papers, occupied the first two days of the week. The first session opened with an address of welcome by Professor C. S. Slichter in behalf of the University of Wisconsin and the local members of the society. The president of the society, Professor E. B. Van Vleck, occupied the chair at this and at the final session. Professor Oskar Bolza presided at the second, and Professor W. F. Osgood at the third session. The council announced the election of the following persons to membership in the society: Mr. W. E. Anderson,

Princeton University; Professor W. O. Beal, Illinois College; Dr. C. A. Fischer, Columbia University; Professor A. E. Landry, Catholic University of America; Lieutenant Salih Mourad, Ottoman navy; Miss E. A. Weeks, Mount Holyoke College. Thirteen new applications for membership were received.

It was decided to hold the summer meeting of 1915 at San Francisco in connection with the Panama Exposition. The secretary reported that a separate office for the society had been provided by Columbia University and that the services of a clerk had been engaged for carrying on the considerable routine work of the secretary, treasurer, librarian, committee of publication and shipping office. It was decided to issue the Register of the society hereafter at intervals of two or three years; in the intervening years only a mere list of officers and members will be published. Professor L. E. Dickson was appointed editor-in-chief of the *Transactions,* the other members of the editorial committee being at present Professors H. S. White and D. R. Curtiss. The society has recently published the Princeton Colloquium Lectures delivered at the sixth colloquium in 1909 by Professor G. A. Bliss on "Fundamental existence theorems" and Professor Edward Kasner on "Differential-geometric aspects of dynamics."

The arrangements made by the local committee for the comfort and entertainment of the members throughout the week were perfect. No place in the middle west could be more ideal for such a series of meetings than Madison. The spacious lecture halls of the university, the beautiful campus occupying an elevated position overlooking the capitol building and the adjacent lakes, Mendota and Monona, the commodious University Club used as headquarters, and the hospitality of President Van Vleck and other members of the faculty who opened their homes for the entertainment of the members—these and many other items contributed to the success of the farthest west summer meeting and only western colloquium.

On Monday evening President Van Vleck entertained at dinner the members of the council and the colloquium lecturers. On Wednesday afternoon the committee provided a two-hours' special excursion on Lake Mendota, ending at the Golf Club House in time for the dinner, at which fifty-five persons sat down. President Van Vleck acted as toastmaster and informal speeches were made by Professors Osgood, Bolza, Moore, Blichfeldt, Dickson and Dr. Jackson. A telegram was sent to the secretary, expressing appreciation of his services to the society and great regret at his enforced absence. At the close of the dinner Professor Ziwet voiced the unanimous sentiment in expressing thanks to the university and the committee on arrangements for their generous hospitality. The dinner was followed by a moonlight ride on the lake back to the University Club. On Thursday the members were conducted by Professor Skinner about the campus and buildings of the university; and on Friday an automobile ride was provided by the mathematical faculty and their friends, giving the members a fine opportunity to see the immediate surroundings of Madison. This ended in a most enjoyable buffet dinner at the home of President Van Vleck.

The following papers were read at the four sessions of the summer meeting:

E. B. Lytle: "Note on iterable fields of integration."

W. H. Bussey: "The tactical problem of Steiner."

Josephine E. Burns: "The abstract definitions of the groups of degree eight."

William Marshall: "The functions of the parabolic cylinder."

L. C. Karpinski: "The algorism of John Killingworth."

R. D. Carmichael: "On series of iterated linear fractional functions."

R. D. Carmichael: "Some theorems on the convergence of series."

T. E. Mason: "The character of the solutions of certain functional equations."

E. B. Van Vleck and F. T. H'Doubler: "On certain functional equations."

Oskar Bolza: "On the so-called 'abnormal' case of Lagrange's problem in the calculus of variations."

E. R. Hedrick and W. D. A. Westfall: "An existence theorem for implicit functions."

R. G. D. Richardson: "A solution of the Rayleigh minimum problem in the theory of sound."

G. C. Evans: "The Cauchy problem for integro-differential equations."

Dunham Jackson: "A formula for trigonometric interpolation."

J. W. Alexander, II.: "Proof of the invariance of certain constants in analysis situs."

J. E. Rowe: "On Fermat's theorem and related theorems (first paper)."

J. E. Rowe: "On Fermat's theorem and related theorems (second paper)."

Maxime Bôcher: "The infinite regions of various geometries."

W. F. Osgood: "On functions of several variables which are meromorphic or analytic at infinity."

W. F. Osgood: "Note on line integrals on an algebraic surface $f(x, y, z) = 0$."

E. H. Moore: "On a class of continuous functional operations associated with the class of continuous functions on a finite linear interval (preliminary communication)."

A. R. Schweitzer: "On a general category of definitions of betweenness."

A. R. Schweitzer: "The theory of linear vectors in Grassmann's extensive algebra."

A. R. Schweitzer: "Remarks on functional equations."

A. R. Schweitzer: "The general logical significance of uniformity of convergence of series."

Edward Kasner: "On the ratio of the arc to the chord for analytic curves."

E. L. Dodd: "The arithmetic mean as approximately the most probable value *a posteriori* under the Gaussian law."

E. J. Wilczynski: "On the surfaces whose directrix curves are indeterminate."

J. B. Shaw: "On the transverse of a linear vector operator of $n$ dimensions."

Florian Cajori: "Zeno's arguments on motion."

O. E. Glenn: "Note on a translation principle connecting the invariant theory of line congruences with that of plane $n$-lines."

F. R. Sharpe: "Conics through inflections of self-projective quartics."

F. R. Sharpe and C. F. Craig: "Plane curves with consecutive double points."

Mildred L. Sanderson: "A method of constructing binary modular covariants."

H. M. Sheffer: "Superpostulates: introduction to the science of deductive systems."

H. M. Sheffer: "A set of six independent postulates for Boolean algebras."

R. M. Winger: "Self-projective rational sextics."

R. M. Winger: "Self-projective rational septimics" (preliminary report).

M. Fréchet: "Sur la notion de differentielle d'une fonction de ligne."

Kurt Laves: "A new theorem concerning the motion of two satellites of finite masses circulating in nearly commensurable motions of type $\frac{1}{2}$ about a central and homogeneous body of ellipsoidal shape."

H. F. Blichfeldt: "On the order of linear homogeneous groups (fifth paper)."

T. R. Running: "Graphical solutions of differential equations between two variables."

R. P. Baker: "The genus of a group."

R. P. Baker: "The topological configurations occurring in finite geometries."

R. D. Carmichael: "On Fermat's theorem and related theorems."

H. W. March: "Integral and series representations of an arbitrary function in terms of spherical harmonics."

The colloquium opened on Wednesday morning and occupied the rest of the week. Two courses of five lectures each were given by Professor L. E. Dickson on "Certain aspects of a general theory of invariants, with special consideration of modular invariants and modular geometry," and Professor W. F. Osgood on "Topics in the theory of functions of several complex variables." Printed syllabi of the lectures had been distributed in advance of the meeting. Fifty-one persons attended the lectures, a larger number than at any previous colloquium. An abstract of the lectures will be published in the *Bulletin* of the society.

The next meeting of the society will be held at Columbia University on Saturday, October 25. The San Francisco Section wili meet on the same day at Stanford University. The annual meeting of the Southwestern Section will be held at the University of Missouri on Saturday, November 29.

H. E. Slaught,
*Acting Secretary*