THE FIFTIETH REGULAR MEETING OF THE SAN FRANCISCO SECTION

The fiftieth regular meeting of the San Francisco Section of the Society was held at the University of California on Saturday, October 30, 1926. Professor Cajori acted as temporary chairman till the arrival of the chairman, Professor Blichfeldt. The total attendance was forty, including the following twenty-two members of the Society:

Alderton, Allardice, A. B. D. Andrews, Bernstein, Blichfeldt, Buck, Cajori, Corbin, R. L. Green, M. W. Haskell, E. R. Hedrick, Hotelling, Frank Irwin, D. H. Lehmer, D. N. Lehmer, Sophia Levy, W. A. Manning, J. H. McDonald, F. R. Morris, Pauline Sperry, A. R. Williams, Wong.

The following officers were elected for the year: Chairman, Professor R. E. Allardice; Secretary, Professor B. A. Bernstein; Program Committee, Professors E. T. Bell, Daniel Buchanan, Frank Irwin, B. A. Bernstein (ex officio).

The Section accepted the invitation of President Klinck of the University of British Columbia that the 1927 Summer meeting be held in June at the University of British Columbia. It was decided to hold the next fall meeting on October 29, 1927, at the University of California.

Titles and abstracts of papers read at the meeting follow. Professor McDonald's paper was delivered at the request of the Program Committee. The papers of Professors Bell and Wear were read by title.

1. Professor J. H. McDonald: *The relations between the algebraic and transcendental solution of certain problems.*

The problems referred to belong to the integral calculus. The determination of integrals requires us to decide whether two elliptic integrals are transformable into each other, whether a given radical admits an Abel-pseudo-elliptic integral, whether a given algebraic relation has an associated elliptic integral. These problems admit enunciations which are arithmetic, algebraic, or function-theoretic. It is the object of the colloquium to consider the different aspects of these problems and to present contributions to their solution.

2. Professor E. T. Bell: *Reduction formulas for the number of representations of integers in certain quadratic forms.*

The algebraic method of the paper enables us to pass from formulas for numbers of representations in a quadratic form in $r \geqq 2$ indeterminates to the like for rs indeterminates, $s > 1$. It is applied to obtain complete proofs of the results stated by Liouville (Journal de Mathématiques, vol. 10, pp. 43–49; vol. 11, p. 211).

3. Professor E. T. Bell: *A diophantine automorphism.*

This paper appears in full in the present issue of this Bulletin.

4. Professor B. A. Bernstein: *Note on the dual of a boolean expression.*

The author obtains a new rule for writing down the dual of an expression in boolean algebras, and he makes some application of this rule.

5. Professor Florian Cajori: *Frederick the Great on mathematics and mathematicians.*

The author describes Frederick the Great's relations to Euler, Maupertuis, Lagrange, D'Alembert and Lambert, and points out that, despite his total lack of appreciation of mathematics, Frederick gave a great stimulus to the progress of this science through the patronage extended to mathematicians at the Berlin academy.

6. Professor Florian Cajori: *Madame du Châtelet on fluxions.*

The author gives Madame du Châtelet's interpretation of Newton's lemmas in the *Principia* relating to the concept of a limit.

7. Professor Florian Cajori: *Circuelo on the names "arithmetical" and "geometrical" proportion and progression.*

The author describes and comments on Circuelo's explanation of the choice of the adjectives "arithmetical" and "geometrical" in naming proportions and progressions.

8. Professor E. R. Hedrick: *A necessary and sufficient condition for the Borel theorem in a general type of space.*

In this paper it is shown that a necessary and sufficient condition for the validity of the Borel theorem in very general types of spaces is that if any family F of closed sets has no point in common, then a finite number of sets of F exist which have no point in common. Another form of this statement is useful. If in any family F of closed sets, every finite subfamily has a point in common, the entire family has a point in common. The relation of the Borel theorem to other fundamental ideas, such as the Dedekind cut, which is well known, is thrown into clearer light through the present formulation, which is simpler and more symmetric, in some respects, than the usual statements of the Borel theorem.

9. Dr. Harold Hotelling: *An application of analysis situs to statistics.*

The frequency distribution of a correlation coefficient between two sets of numbers derived by manipulation from a common body of data is important in some kinds of statistical work. These frequency distributions have however been studied only experimentally, if at all, and little is known about them. The author shows that their exact determination would be equivalent to solving certain metrical problems concerning special transformations of a hypersphere into itself. J. W. Alexander's theorems on invariant points reveal properties of the distributions.

10. Professor D. N. Lehmer: *Note on a theorem on factorization of numbers.*

This paper appears in full in the present issue of this Bulletin.

11. Professor L. E. Wear: *A variation in the idea of a line integral.*

Under suitable conditions the line integral $\int_L f(x, y)dx$ is $\lim_{n\to\infty} \sum_{i=1}^{n} f(\xi_i, \eta_i)\Delta x_i$, where n is the number of intervals into which the arc of the path has been divided and ξ_i, η_i is a point on the path within the ith interval. The perpendiculars to Ox from the ends of the intervals intercept the lengths Δx_i on the axis of x; they intercept arcs Δs_i on some suitable curve, C. The integral $\int_L f(x, y)ds$ will be defined as $\lim_{n\to\infty} \sum_{i=1}^{n} f(\xi_i, \eta_i)\Delta s_i$, where the values $f(\xi_i, \eta_i)$ are to be taken on the path L, and Δs_i are arcs of the curve C. By using the equations of L and C the integral is reduced to an ordinary definite integral. The ideas can be extended to the general case of $\int_L Mdx+Ndy$ and the analog of Green's Theorem can be written down. Similarly for higher spaces.

12. Professor W. A. Manning: *On simply transitive primitive groups.*

Three of the theorems in Rietz's memoir on *Primitive groups of odd order* (American Journal, vol. 26 (1904), p. 1) have to do with simply transitive primitive groups in which all the transitive constituents of a subgroup leaving one letter fixed are primitive. The present author shows that they are all special cases of the following theorem: *If all the transitive constituents of G_1 (the subgroup that leaves fixed one letter of a simply transitive primitive permutation-group) are primitive, G_1 is a simple isomorphism between its transitive constituents.* The author also proves the following theorem: *If one and only one of the transitive constituents of G_1 (defined above) is an imprimitive group, the order of G_1 is the same as that of its imprimitive constituent.*

B. A. BERNSTEIN,
Secretary of the Section.