germs in the upper air for his studies on the distribution of disease, was a disaster to science the magnitude of which can only be appreciated by those who have worked with him. He was dean of the Medical School of the George Washington University and was engaged in scientific work of originality and importance. In addition to these engagements he devoted a considerable part of his time and unlimited energy to scientific organization. In recent years he has taken a leading part in the work of the American Association for the Advancement of Science and for it his loss is irreparable. As one of the editors of *The Scientific Monthly* he would surely have had the usefulness and the success that attended all his enterprises. McKinley had genius for scientific research, organization and administration; most of all, for friendship. There is none like him, none, nor will be.

J. McK. C.

SOCIETIES AND MEETINGS

THE SEMICENTENNIAL CELEBRATION OF THE AMERICAN MATHEMATICAL SOCIETY

IN recognition of the fiftieth anniversary of its founding as the New York Mathematical Society, the American Mathematical Society arranged for its summer meeting this year not only a scientific program of unusual interest, but a jubilee celebration of significance. The meetings were held from September 6 to 9, at Columbia University.

Preceded by seven sectional meetings, at which over one hundred research papers were communicated, the scientific part of the anniversary observance consisted of ten invited addresses reviewing aspects of the development of mathematics during the past fifty years and pointing out some of the indications for progress in the future. The speakers and their topics were as follows:

R. C. Archibald, Brown University, "History of the American Mathematical Society, 1888–1938."

G. D. Birkhoff, Harvard University, "Fifty Years of American Mathematics."

E. T. Bell, California Institute of Technology, "Fifty Years of Algebra in America, 1888–1938."

G. C. Evans, University of California, "Dirichlet Problems."

E. J. McShane, University of Virginia, "Recent Developments in the Calculus of Variations."

J. F. Ritt, Columbia University, "Algebraic Aspects of the Theory of Differential Equations."

J. L. Synge, University of Toronto, "Hydrodynamical Stability."

T. Y. Thomas, University of California at Los Angeles, "Recent Trends in Geometry." (Read by Mr. J. F. Daly, of Princeton University.)

Norbert Wiener, Massachusetts Institute of Technology, "The Historical Background of Harmonic Analysis."

R. L. Wilder, University of Michigan, "The Sphere in Topology."

These addresses, except that by Professor Archibald, have been published by the society under the title of "Semicentennial Addresses," as Volume II of its Semicentennial Publications. Volume I is a history of the society written by Professor Archibald and containing in greatly amplified form the material of his lecture. The fact that these volumes were in print and ready for distribution at the time of the meeting added not a little to the import of the addresses as part of an anniversary celebration.

Several scientific exhibits dealing with the history, teaching and applications of mathematics were arranged by Columbia University and members of its faculty; these also added greatly to the celebration.

The features of the meeting more closely related to the jubilee were introduced by a reception tendered by Columbia University to the visiting mathematicians, who were received by President and Mrs. Nicholas Murray Butler. Immediately following the reception, a convocation of the society was held, at which delegates from sister organizations were introduced, and letters of greeting and felicitation presented. This gathering also afforded an occasion for the society to voice its gratitude to Columbia University for its hospitality and patronage during the half-century, for the American Mathematical Society was founded at Columbia, by Columbia men; over half of its regular meetings have been in Columbia halls; and its office and library have been housed in Columbia buildings. Professor Rudolph E. Langer, of the University of Wisconsin, vice-president of the society, delivered a brief address of appreciation on behalf of the society for what it had received from Columbia (in the words of Professor Langer) "the worthiest and sublimest of gifts . . . a portion of herself." Following this, Professor Langer presented to President Butler a copy of the address, beautifully printed on French hand-made paper, and a copy of each of the two volumes of the Semicentennial Publications, specially bound in brown pigskin and bearing a suitable dedicatory inscription. President Butler responded in a noteworthy address.

The most outstanding feature of the celebration, however, was surely the "Birthday Dinner," at which the society delighted to honor its founder, Professor Thomas Scott Fiske, of Columbia University. It must indeed be almost unique in the annals of scientific organizations for a society to be able to honor its

founder in person at its jubilee. To him was presented an illuminated testimonial containing a greeting of appreciation and affection, prepared by order of the society and signed by the president and secretary. There was presented to Miss Natalie P. Fiske, daughter of Professor Fiske, and to the society bronze replicas of a sculptured bas-relief portrait of Professor Fiske, done by the young Philadelphia sculptor, Mr. George John Sklaar, of the faculty of the New Jersey College for Women. A group of mathematicians who had been associated with Professor Fiske in the work of the College Entrance Examination Board presented to the society a portrait of Professor Fiske painted by Mrs. H. E. Ogden Campbell. Professor Fiske spoke in reminiscent vein of interesting events in the early days of the organization.

As a fitting climax to this central event of the celebration, letters addressed to Professor R. G. D. Richardson, secretary of the society, were read from President Franklin D. Roosevelt and Prime Minister W. L. Mackenzie King, of the Dominion of Canada, for the American Mathematical Society extends north of the border. The emphasis reflected in these letters may well be gratifying to all scientists. They are as follows:

From President Franklin D. Roosevelt:

Please extend my greetings to the American Mathematical Society on the occasion of the celebration of its fiftieth anniversary. I trust that genuine satisfaction will come to its members as they contemplate the contribution which the Society has made during the half century of its existence.

It is sometimes difficult to comprehend the values accruing to society from mathematics. It is deeply rooted in social progress as a large part of the technological advance made in recent centuries would have been impossible had it not been for the constant refinement of the essential tool of technology—mathematics. Social sciences also owe a large debt to mathematics. Future advances in the social sciences will be largely dependent upon mathematical treatment of their data.

I congratulate the members of the American Mathematical Society on the important contributions which mathematics has already made. I trust that the years ahead will find mathematicians making significant contributions, as in the past.

From Prime Minister W. L. Mackenzie King:

I shall be pleased if you will extend to the American Mathematical Society, on the celebration of the fiftieth anniversary of its inception, my greetings and warm congratulations upon attaining this significant anniversary.

It is well that we should reflect, on occasions such as this, on the extent to which the learned societies of this continent have contributed to the strength and substance of our national and international life. The work of the American Mathematical Society fills a distinguished place among those academic fellowships which have done so much to keep alive, in our institutions of learning, that integrity of thought which is one of the proudest of our common traditions.

It is my hope that the deliberations of the Society's Jubilee Meeting will be attended by much good fellowship and a lively appreciation of the binding character of the academic fraternity which has so long and so happily prevailed between our two countries.

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SPECIAL ARTICLES

REPULSIVE FORCES BETWEEN CHARGED SURFACES IN WATER, AND THE CAUSE OF THE JONES-RAY EFFECT

CONSIDER a plane surface of potential V which bounds a semi-infinite volume of a dilute salt solution of potential 0. Taking the salt to be of the univalent type, such as KCl and applying the Poisson and Boltzmann equations, the potential distribution must satisfy the equation

$$\frac{d^2V}{dx^2} = 4\pi n_0 (e/D)\,[\exp(Ve/kT) - \exp(-Ve/kT)], \qquad (1)$$

where n_0 is the number of ions (of each sign) per unit volume in the solution in regions where $V = 0$.

Let us put

$$\eta = Ve/kT \qquad (2)$$

and

$$\theta = x/\lambda \qquad (3)$$

where λ, the value of $1/\kappa$ in the Debye-Hückel theory, is given by

$$\lambda^2 = DkT/8\pi e^2 n_0 \qquad (4)$$

Eq. (1) then becomes

$$2d^2\eta/d\theta^2 = \varepsilon^{\eta} - \varepsilon^{-\eta} \qquad (5)$$

In the Debye-Hückel theory it is assumed that η is so small that ε^{η} can be replaced by $1+\eta$. We wish, however, to apply Eq. (5) to two parallel plates which are separated by the distance b but are so close together and are so highly positively charged that $\eta >> 1$, everywhere between the plates. The Debye-Hückel approximation therefore can not be used, but instead, we can neglect $\varepsilon^{-\eta}$ in Eq. (5), since it is small compared to ε^{η}.

Integration gives

$$\theta = 2\exp(-\eta_M/2)\,\tan^{-1}[\exp(\eta - \eta_M) - 1]^{1/2} \qquad (6)$$

where η_M is the minimum value of η which occurs at the plane half way between the plates and θ measures the distance from this median plane. If η_1 and θ_1 are the values of η and θ at the surface of the plates and