THE APRIL MEETING OF THE IOWA SECTION

The 49th regular meeting of the Iowa Section of the Mathematical Association of America was held at Wartburg College, Waverly, on April 13 and the morning of April 14, 1962. Chairman Hazel M. Rothlisberger presided. Total attendance was 91, including 22 members of the Association. Routine business was considered during the afternoon meeting of April 13.

A treasurer's report was given and a balance of $197.84 was indicated.

The following officers were elected:

Chairman, L. E. Pursell, Grinnell College, Grinnell

Vice-Chairman, C. H. Lindahl, Iowa State University, Ames

Secretary-Treasurer, Earle L. Canfield, Drake University, Des Moines

Nominees for Governor of the Iowa Section, A. T. Craig, State University of Iowa, Iowa City, and J. J. L. Hinrichsen, Iowa State University, Ames

Discussion was held regarding the Iowa high school mathematics contest arrangement. It was agreed the present plan in conjunction with the Actuaries' Club of Des Moines was a satisfactory one.

Brief discussion was held concerning the possibility of establishing an Iowa newsletter. No action was taken.

Conflicting dates between the Iowa Section spring meeting date and the regional meeting of the American Mathematical Society were discussed. The Secretary was directed to explore through the Iowa Academy of Science the possibility of changing the spring date to avoid conflicts.

The following papers completed the program:

Friday morning, April 13, 1962, 8:45-10:45

Newtonian gravitational potential for an oblate spheroid. Kempton L. Huehn, Iowa State University, introduced by the Chairman.

An expression for the Newtonian gravitational potential function for a homo-

geneous oblate spheroid is found by considering a boundary value problem on Laplace's differential equation. Of the four terms retained of the potential function, the first term is due to a sphere and the other three terms have coefficients which are functions of the oblateness.

American vs. Russian mathematics education. Professor G. H. Miller, Fairfield.

Friday afternoon, 2:00-4:15

A connected topology for $[0,1]$. Professor Shelby K. Hildebrand, Iowa State University.

A topology, $\mathcal{T}$ on $I = [0,1]$ is given which has the following properties: $\mathcal{T}$ is a connected topology finer than the usual topology. If $\mathcal{T}_R$ is the topology generated by the open sets of $\mathcal{T}$ and right-closed intervals and $\mathcal{T}_L$ is the topology generated by the open sets of $\mathcal{T}$ and by left-closed intervals, then there exist subsets of I, call them L and R, such that $L \cup R = I$, $0 \in L, \in 1 \in R, \in L$ open in $\mathcal{T}_L$, R open in $\mathcal{T}_R$ and $L \cap R = \emptyset$. {This answers a question posed by J. Stallings in Fundamenta Mathematicae XLVII (1959).}

Opaque subsets of a square. Professor R. E. Douglas Jones, Iowa State University.

An opaque set of degree α is defined for any cardinal number α. It is shown that if $2 \leq \alpha \leq c$, there exists an opaque set of degree α. From the definition it is easily seen that there is no opaque set of degree one or of degree greater than c.

Application of the Mellin transform to boundary value problems. David Lomen, Iowa State University, introduced by the Chairman.

The Mellin transform is investigated with special emphasis on its applications to the solution of boundary value problems. A technique is given for solution of Laplace's equation in plane polar and spherical polar coordinates.

On the construction of the measurable sets. Donovan F. Sanderson, Iowa State

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University, introduced by the Chairman.

Given a measure function a, it is possible to determine a binary relation Q on the set of a-measurable sets according to the definition: If A and B are a-measurable sets, then AQB if and only if $a(A) \leq a(B)$. On the basis of certain axioms for such a Q, we may construct, among other things, the Lebesgue measurable sets without using the completeness property of the real number system.

Saturday morning, 8:00-10:00

Periodic integral surfaces for periodic systems of differential equations. Professor Donald D. James, Iowa State University.

Vector functions with linear norms. Professor George Seifert, Iowa State University.

A subset S of a Banach space of continuous vector functions on the real interval $0,1$ is shown to be conditionally compact, convex, and to consist of functions all of which have the same linear norm bu, u in $0,1$. If the vector space of function values is n-dimensional, real, and Euclidean, then S reduces to a single function $u(\alpha)$, α a vector. Examples are given to show that this is not true in general.

The least-squares approximate solution of a linear ordinary differential equation. Derald Walling, Ames, introduced by the Chairman.

Stability of generalized predictor-corrector methods. Roger L. Crane, Ames, introduced by the Chairman.

Iowa State Univ.