

CONGRES DES SOCIETES SAVANTES
CONFERENCE OF THE LEARNED SOCIETIES

Société canadienne d'histoire et de philosophie des mathématiques
Canadian Society for History and Philosophy of Mathematics

Le vendredi 4 juin 1976 Friday, June 4

Université Laval, Québec

PROGRAMME

9:30 ADMINISTRATION 341 (ADM 341)

CONFERENCIER INVITE / INVITED ADDRESS

THE SCIENTIFIC FOUNDATIONS OF ANCIENT AND MEDIAEVAL COSMOLOGY

by

Professor Asger Aaboe
Yale University

11:00 ADM 341

ASSEMBLEE ANNUELLE / ANNUAL MEETING

14:00-16:00

COMMUNICATIONS / CONTRIBUTED PAPERS

20:00

RECEPTION

COMMUNICATIONS / CONTRIBUTED PAPERS

Twenty minutes are allocated for the presentation of the paper, five minutes for a question period and five minutes for a change-over.

Les communications dureront vingt minutes, la période de questions cinq minutes et la pause cinq minutes aussi.

SESSION I ADM 341

- 14:00 Kennedy, Hubert C. Providence College, R.I.
Karl Marx and the Foundations of Differential Calculus
- 14:30 Lehmann, Hugh University of Guelph, Ont.
Proof in Mathematics
- 15:00 Moore, Gregory H. University of Toronto, Ont.
Cantor's Continuum Problem: The Thorny Path to its Solution
- 16:00 Abeles, Francine Kean College of New Jersey, N.J.
The Mathematical Thought of Jean Piaget, I Topology

SESSION II (*) ADM 015

- 14:00 Thompson, Ron. B. (**)
Jordanus de Nemore: Biographical Problems of a 13th-Century Mathematician
- 14:30 Higginson, Bill Queen's University, Ont.
Mathematicians in Colonial Canada: Bougainville and Maseres
- 15:00 Stevens, W.M. (**)
Winnipeg
Teaching the Liberal Arts at Fulda - Mathematical Sciences in the 9th Century
- 15:30 Craig, Robert T. Herbert H. Lehman College, N.Y.
History of Modern Group Theory in the U.S. 1888 - 1916

SESSION III (*) ADM 019

- 14:00 Zeman, V. (**)
The Infinitesimal and Reality
(This paper will be followed by a commentator).
Concordia University, Québec
- 14:30+ Castonguay, Charles
Le théorème de Church et les raisonnements synthétiques a priori en mathématiques.
Université d'Ottawa, Ont.
- 15:00+ Gross, Timothy J.
Crucial Experiments in Cosmology: The Russell-Poincaré Controversy
University of Notre Dame, Ind.
- 15:30+ Bunge, Mario
How do Mathematical Objects Exist?
McGill University, Québec

* Session conjointe avec la Société canadienne d'histoire et de philosophie des sciences.

A joint session with the Canadian Society for History and Philosophy of Science (SCHPS/CSHPS).

** SCHPS/CSHPS

COMMUNICATIONS

CONTRIBUTED PAPERS

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1. Abeles, Francine Kean College of New Jersey, Union, N.J.

THE MATHEMATICAL THOUGHT OF JEAN PIAGET, I TOPOLOGY

"All knowledge has to do with structures," Piaget wrote in 1961 in The Mechanisms of Perception. In The Child's Conception of Space, written about twenty-five years earlier, he discusses the "groupings" of additions and subdivisions of proximities and separations; of the formation of ordered series and of enclosure by means of surrounding. These elementary structures are the origin of the group of continuous transformations. By examining some of the major works of Piaget, we trace the evolution of his thinking about topology, especially the influence of the Bourbaki school on that development.

2. Castonguay, Charles University of Ottawa, Ottawa, Ont.

KANT, HINTIKKA, AND THE ANALYTIC/SYNTHETIC DISTINCTION IN MATHEMATICS

Kant judged that mathematics is associated with a special type of reasoning which he called synthetic a priori. Jaakko Hintikka has recently presented some results in mathematical logic as justifying Kant's notion. It is argued that Hintikka's interpretation of Kant is forced and unnecessarily complicated, and that Kant's evaluation of the nature of mathematical reasoning can be more easily and naturally justified using Church's Theorem. By adjusting Kant's epistemology of mathematics to take into account the present state of mathematical knowledge, while remaining faithful to the spirit of Kant's work, one obtains a more satisfying justification of his vision of mathematics than that proposed by Hintikka.

3. Craig, Robert T. Herbert H. Lehman College, Bronx, N.Y.

HISTORY OF MODERN GROUP THEORY IN THE U.S. 1888-1916

Research into the history of finite group theory in the United States during the formative years. Finite group theory was the first major contribution of American research mathematicians.

4. Gross, Timothy J. University of Notre Dame, Notre Dame, Ind.

CRUCIAL EXPERIMENTS IN COSMOLOGY: THE RUSSELL-POINCARÉ
CONTROVERSY

In his Cambridge dissertation (*The Foundations of Geometry*), Bertrand Russell hastily summarizes the views of Henri Poincaré, but misconstrues them in the process. In the ensuing exchange (in the *Revue de Métaphysique et de Morale*), Poincaré clarified the main tenets of conventionalism, while Russell attempted to defend the view that the geometrical structure of space is open to experimental investigation. This paper summarizes the arguments presented by each of these men, and adjudicates in favor of Poincaré.

5. Higginson, Bill Queen's University, Kingston, Ont.

MATHEMATICIANS IN COLONIAL CANADA: BOUGAINVILLE AND
MASERES

Among the members of the colonial service in pre-Confederation Canada were some very able mathematicians. Two of these were Comte Louis Antoine Bougainville, aide-de-camp to General Montcalm and Francis Maseres, Solicitor-General in Quebec between 1766 and 1769. This paper outlines the mathematical careers and contributions of these two men.

6. Kennedy, Hubert C. Providence College, Providence, R.I.

KARL MARX AND THE FOUNDATIONS OF DIFFERENTIAL CALCULUS

The publication of the complete mathematical writings of Karl Marx was announced at the International Congress of Mathematicians in Zurich in 1932. This did not take place, however, until 1968, but in the meantime some fragments were published and there were several studies of them, especially by Soviet mathematicians. Since 1968 interest in Marx' mathematical writings has increased and there is now wide-spread recognition of the value and originality of Marx' ideas, particularly those regarding the foundations of differential calculus. This paper gives a description of Marx' writings in this field and tries to show how they fit into the historical development of mathematics and how they illustrate the philosophy of dialectical materialism of Marx and Engels.

7. Lehman, Hugh University of Guelph, Guelph, Ont.

PROOF IN MATHEMATICS

This paper discusses several different definitions of mathematical proof --- an argument which shows that its conclusion is true; a valid argument with true premisses; an argument in accord with a conventional form. The paper argues in favor of the following definition - a proof is an argument in mathematics which can enable someone who understands the premisses to come to know the conclusion,

8. Moore, Gregory H. University of Toronto, Toronto, Ont.
CANTOR'S CONTINUUM PROBLEM: THE THORNY PATH TO ITS SOLUTION

This paper presents the history of the Continuum Problem from 1878 to the present day.

- *9. Stevens, W. M.
TEACHING THE LIBERAL ARTS AT FULDA - MATHEMATICAL SCIENCES IN THE NINTH CENTURY

An illustrated lecture.

- *10. Zeman, V. Concordia University, Montreal, P.Q.
THE INFINITESIMAL AND REALITY

A historical and systematic discussion of the relation between the mathematical concept of an infinitely small number, a physical concept of continuity and the philosophical concept of reality. Some possible advantages of H. Cohen's project for a justification of the unity of all forms of knowledge will be listed, then the misconceptions in the very basis of the theory will be revealed. The paper will try to show why not only the Kantian but also the Cohenian pure metaphysics of nature had to fail in spite of their switch from a purely metaphysical towards a transcendental form of justification.

*9 and *10 are sessions of the Canadian Society for History and Philosophy of Science.