CANADIAN SOCIETY FOR HISTORY AND PHILOSOPHY OF MATHEMATICS

SOCIETE CANADIENE D'HISTOIRE ET DE PHILOSOPHIE DES MATHEMATIQUES

Fourteenth Annual Meeting *Quatorzième Congrès Annuel*

May 29 *30 mai*
1988

University of Windsor
Windsor, Ontario

PROGRAMME

SCHEDULE

All sessions in Business Building Room 1122

Sunday, May 29 **(PRESIDER: R. H. Eddy)**

MORNING

SPECIAL SESSION ON VICTORIAN SCIENCE

9:15	**WELCOME**	
9:20	F. Abeles, Coordinator Victorian Science Session	Introduction of guest speaker
	H. Pycior (Guest Speaker)	Title to be announced
10:15	**COFFEE**	
10:40 -11:25	I. Anellis	The nineteenth century roots of universal algebra and algebraic logic: A critical-bibliographical guide for the contemporary logician.
11:30 -12:00	F. Abeles	Victorian periodic poly-alphabetic ciphers.
12:00 -2:00	**LUNCH** (Organized lunch: cold buffet with hot entrée in Rose Room, Vanier Hall)	

APRÉS MIDI

2:00 -2:50	L. Berggren	Ptolemy's geometrical methods.
3:00	Annual Meeting/Assemblée Genérale	
4:30 -6:00	**PRESIDENT'S RECEPTION**	

Monday, May 30

MORNING
(PRESIDER: R. Herz-Fischler)

9:15 -10:00	I. Anellis	A history of logic trees.
10:10 -10:30	**COFFEE**	
10:30 -11:15	C. Fraser	Methods of the Calculus in Newton's Principia Book one.
11:20 -12:00	R. Eddy	A glimpse at Cremona transformations through a Euclidean eye.
12:00	**LUNCH**	

APRÉS MIDI
(PRESIDER: Craig Fraser)

2:00 -2:30	A. Schenitzer	The Cinderella career of projective geometry.
2:40 -3:15	R. Herz-Fischler	The history of the Magirus-Kepler Theorem.
	COFFEE	
3:30 -4:00	V. Katz	Why not trigonometry?

ABSTRACTS - RESUMES

1. F. Abeles (Kean College of NJ): *Victorian periodic polyalphabetic ciphers.*

The invention of the telegraph was responsible for fundamental changes in methods of encryption, particularly for the military. Polyalphabetic ciphers, thought to be secure, were "reinvented" for use as field ciphers. In this paper we exammine two of the most popular nineteenth century periodic polyalphabetic ciphers, the Vigenère and Beaufort Tableaus. Then we consider their use and extension by C. L. Dodgson in his ALPHABET and TELEGRAPH ciphers.

2. I. H. Anellis (Philosophia Mathematica): *The nineteenth century roots of universal algebra and algebraic logic.*

The historian of logic tells us that there were two traditions, the algebraic tradition of Boole, Schröder, and Peirce, and the quantification theoretical tradition of Peano, Frege, and Russell, that were united by Whitehead and Russell in their Principia Mathematica to create mathematical logic. Most historians have held that the algebraic tradition had been the inferior of the two, that it reached a dead-end and was absorbed into the quantification-theoretic tradition in the Principia. Nevertheless, algebraic logic and universal algebra remain strong today, and research continues, not only unabated, but making powerful and profound progress.

Most contemporary researchers in algebraic logic and universal algebra have only a very vague conception of their historical roots, and take their primary sources of inspiration from the work of their immediate predecessors of the 1930s to 1950s, principally Birkhoff, Tarski, and their more prominent contemporaries. For those algebraists who would like to study the fundamental historical roots of their discipline and the ideas of its principal founders, we will sketch the historical and contemporary situation in investigations into the history of algebraic logic and universal algebra and provide a select bibliography of readily accessible materials to which the interested reader may turn.

3. I. H. Anellis (Iowa State University): *A History of logic trees.*

The tree method is one of several decision procedures available for propositional logic and first-order predicate logic. Falsifiability trees allow easy testing of the validity of proofs and are canonizations of proof by contradiction for axiomatric systems, while truth trees allow easy derivation of theorems in propositional logic and first-order logic. Tree proofs permit geometric representations of logical relations and appear to be of greater intuitive accessibility than either the axiomatic method or the method of natural deduction. I shall trace the history of the tree method, from its tentative origins in the Gentzen sequent-calculus and the method of natural deduction, through its comprehensive evolution and development as the Smullyan tree (1968) from Beth tableaux (1955) and Hintikka's theory of model sets (1953, 1955). Some attention will also be paid (time permitting) to results of the 1970s on the completeness and soundness of the tree method.

4. L. Berggren (Simon Fraser University): *Ptolemy's geometrical methods.*

Historians of mathematics have often interpreted two smaller treatises by Ptolemy - *The Planispherium* and *The Analemma* - as well as cartographic sections of *The Geography* as Ptolemy's attempts to express in the language of his day the concepts we now call stereographic projection, descriptive geometry and cartographic projections. I shall argue that this point of view has created unneccesary problems of historical interpretation that do not arise under a view that I shall suggest is closer to Ptolemy's own.

5. R. Eddy (Memorial University of Newfoundland): *A glimpse at Cremona transformations through a Euclidean eye.*

Cremona transformations are useful tools for the classical algebraic geometry problem of untying nasty singularities in plane algebraic curves. In this talk, we illustrate how certain special cases of this transformation may be used to *categorize* certain points, lines, and conics important in the geometry of the triangle.

6. C. Fraser (University of Toronto): *Methods of the calculus in Newton's Principia Book One.*

This talk will examine how Newton uses calculus methods and ideas to establish results in particle dynamics, as well as how the same results were approached by such continental researchers as Varignon using Leibnizian techniques.

7. R. Herz-Fischler (Carleton University): *The history of the Magirus-Kepler theorem.*

In a letter written in 1597, Kepler discussed the problem of constructing a "...right triangle all of whose three sides are mutually and continuously proportional so that just as the lesser side is to the greater around the right triangle so is the latter to the one subtended by the right angle [i.e. the hypotenuse]."

It turns out that interest in this problem neither originated nor ended with Kepler. Not only do we still have an interesting contemporary comment on Kepler's solution, but, as it turns out, it has been rediscovered on several occasions. In particular, this result is connected with "Great Pyramiditis" (unfortunately a non-rare and apparently incurable disease of the mind) and with the origins of "golden numberism".

8. V. Katz (University of the District of Columbia): *Why not trigonometry*?

Trigonometry was invented in Greece sometime in the 2nd century B.C. and appears quite fully developed in the work of Ptolemy in the 2nd century A.D. It then spread over the next ten centuries to India, China, the Arab world, and finally western Europe. But virtually nowhere during this period was trigonometry used in any field other than astronomy. We will explore the question "why not?" over this time period.