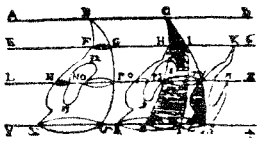

Canadian Society for History and Philosophy of Mathematics

Société canadienne d'histoire et de philosophie des mathématiques

SEVENTH ANNUAL CONFERENCE/SEPTIEME CONGRES ANNUEL

MONTREAL-QUEBEC

3-4 June/juin 1980

Pavillon Hubert-Aquin

Université du Québec à Montréal.

- Tuesday, June 3/Mardi, 3 juin.

10h10-12h30 History of Mathematics in Canada
Histoire des mathématiques au Canada.
A-2835 (with the Canadian Mathematical Society/avec la Société Mathématique du Canada).

Chairperson/président: Chandler Davis, University of Toronto

G. de B. Robinson (Toronto): "Mathematics in Toronto".

Michael P. Closs (Ottawa): "The ritual use of number in the Ojibway medecine scrolls".

J. Peter Denny (Western Ontario): "Eskimo and algonginan mathematical concepts".

Louis Charbonneau (U.Q.A.M): "L'enseignement des mathématiques dans les collèges classiques du Québec au 19ième siècle".

14:00-15:00 Contributice Papers/Communications
A-2890

Chairperson/président: Charles V. Jones, University of Toronto

Giovanna Cifoletti (U. de Montréal): "Maximum et minimum chez Fermat".

M.A. Malik (Concordia) "A note on Cavalieri integration".

15:15-16:30 Contributed Papers/Communications

A-2890

Chairperson/président: Philip Enros, University of Toronto

Roger Fischler (Carleton): "Division in extreme and mean ratio in greek mathematics".

Charles V. Jones (Toronto): "The influence of Zeno's paradoxes on the development of mathematics".

R.C. Gupta (B.I.T., India): "The process of averaging in the history of Mathematics".

15:15-18:00 Toposes/Topos. (With the Canadian Mathematical Society avec la Société Mathématique du Canada)
A- 1788

Chairperson/président: Joachim Lambek, McGill.

William Lawvere (SUNY, Buffalo): "Categorical dynamics".

Philip Scott (McGill): "Intuitionise type theory and the full topos".

André Joyal (UQAM); "What is the significance of topos theory for mathematical logic?"

Michael Makkai (McGill): "The prime completion of coherent topos".

- Wednesday, juin 4,/mercredi le 4 juin.

9:30-11:00 Recent mathematics/mathématiques récentes

A-2890

Chairperson/président: B. Arthur Miller, Mount Allison.

Roy Ryden (Humboldt St. U., California): "Mardell and the Manchester School of numbertheory".

Francine Abeles, (Kean College, N.J.): "Apportionment and proportional representation, carrollian view".

Thomas M. Thompson, (Walla walla Coll., Washington): "Error-correcting codes: The beginnings".

11:30-14:00 Business Meeting/assemblée générale

A-2890

A light meal will be served/un repas léger sera servie.
Invited speaker/conférencier invité: R.C. Gupta (B.I.T., India): "A survey of the study and activities in history of mathematics in India".

14:15-15:15 Contributed papers/Communications

A-2890

Chairperson/président: Jacques Lefebvre, U.Q.A.M. .

Victor J. Katz (U. of District of Columbia); "The change of variable formula - Euler to Ostrogradsky".

B. Arthur Miller (Mount Allison): "Fact or fiction? The infinite and the infinitesimal in 18th century mathematics".

15:30-16:30 Invited speaker/conférencier invité.

A-2890

Maurice L'Abbé (Conseil des Sciences du Canada): "Montréal et le développement des mathématiques au Canada et au Québec".

Nota Bene

- Please note that the Publishers' display of their books is located in the "Galerie UQAM", Room J-R240, pavillon Judith-Jasmin (9 am to 6 pm)/Les éditeurs exposent leurs livres à la Galerie UQAM, local J-R240 du pavillon Judith Jasmin, de 9:00 h à 18:00 h.

- How to get published? An informal, question and answer session on: How to choose a publisher? How best to submit a manuscript? How to get a grant? Thursday, June 5, Room J-1975, from 4:30 pm/ Comment se faire publier? Une simple séance d'information et de discussion sur: Comment choisir une maison d'édition? Quelle est la meilleure manière de soumettre un manuscrit? Comment obtenir une subvention? Jeudi, le 5 juin à 16:30, local J-1975.

- Of interest to our membership will be the sessions of CSHPS to be held on June 5,6,7. Louis Charbonneau has some copies of the program for those who may be interested/La Société canadienne d'histoire et philosophie des sciences se réunie les 5,6,7 juin. Le programme est disponible. Il suffit de le demander à Louis Charbonneau.

- Louis Charbonneau has also one copy of the Canadian Association of Philosophy/Louis Charbonneau a une copie du programme de l'Association canadienne de philosophie.

FRANCINE ABELES

Apportionment and Proportional Representation, A Carrollian View

In November, 1884 Charles L. Dodgson (Lewis Carroll) published The Principles of Parliamentary Representation. In it is his theory of apportionment based on his theory of proportional representation. Dodgson's approach to PR is an optimization scheme for minority representation and his approach to apportionment involves two exact quotas, one for determining the number of representatives according to the number of votes; the other for apportioning districts according to the number of votes.

All acceptable apportionment methods must approximate proportionality by population. The method advocated by PR advocates in England in Dodgson's time is known as the Hare System with the Droop quota. Dodgson's method is not only an improvement over the Hare System, but is an independent formulation of what is known in modern apportionment literature as the Jefferson or D'Hondt or Greatest Divisors method. Politically the advantages of the Greatest Divisors Method are that it avoids a pitfall of PR of affording representation to "splinter" groups and it is not susceptible to the "Alabama Paradox," where a district loses a member when the size of the legislative body increases. Mathematically, the GD method is the unique, monotone, stable and balanced method that encourages coalitions. Curiously, these strengths of the GD method did not begin to be known until 1921, 37 years after Dodgson published his Principles.

ROGER FISCHLER

Division in Extreme and Mean Ratio in Greek Mathematics

Division in extreme and mean ratio is defined in Euclid VI, definition 3 and two approaches to the construction appear in II, 11 and VI, 30. There are several questions of interest including: the origin of the concept, the chronology of II, 11, IV, 11 and XIII, 8, the relationship with the concept of "applications of areas" and the relationship to the discovery of incommensurability. Another aspect which is of interest is the numerical computation of the value of the ratio. This paper will discuss the litterature dealing with these matters and present some of the author's views.

R.C. GUPTA

The Process of Averaging in the History of Mathematics

In the history of mathematics, the use of average (A.M.) of two or more values has frequently yielded helpful results. This was especially so in those cases in which the exact results were not known or were cumbersome to derive. However, averaging was considered so simple, practical, and effective that it was often adopted even at the cost of accuracy when exact results were not out of easy reach, e.g., in the case of the formula $h(a+b+c)/3$ for the area of a drum shaped (double-trapezium) figure. The paper deals with several cases of computation of areas, volumes, square-roots, etc., where the average played a role. In some cases the interpretations are quite interesting.

VICTOR J. KATZ.

The Change of Variable Formula - Euler to Ostrogradsky

It is well-known that Euler was the first to use the change of variable formula for multiple integrals. His method of proof and his motivation, however, do not seem to be mentioned in the literature. Given that x and y are functions of t and v, Euler tried the obvious formalism of calculating dx and dy in terms of dt and dv and multiplying the terms together. When he realized that this method could not work, he developed another formal method which gave him the correct answer. Lagrange and Laplace, among others, soon made the obvious generalization to three variables and Ostrogradsky, somewhat later, to any number of variables. Meanwhile Gauss had already begun the process of showing how Euler's original formal multiplication could be made to work, a process completed by Cartan in his work on differential forms around 1900.

M.A. MALIK

A Note on Cavalieri Integration

In 1635 Bonaventura Cavalieri established $(k+1)\Sigma x^k = c^{k+1}$; a result equivalent to $\int_0^c x^k dx = c^{k+1}/k+1$. The result for k = 2 is the crucial one in the discussion but 'the argument presented by Cavalieri is stated in a confusingly verbose geometrical terminology'. In this note, we present a proof of this assertion following the method as of Cavalieri.

R. RYDEN

L.J. Mordell and The Manchester School of Number Theory

During the thirties Mordell built up a strong school of number theory at the University of Manchester. Amongst those active there were Davenport, Mahler, and Heilbronn. A brief investigation of this productive school will be made.

G. de B. ROBINSON

Mathematics in Toronto

A history of one of the most important departments at Canada's largest university.

1. Background and Early Years
2. 1843-76 R. Potter, R. Murray, J.B. Cherriman
3. 1876-87 James Loudon
4. 1887-1919 Alfred Baker
5. 1919-34 Alfred T. deLury
6. The Operation of the Department and its Graduate Studies
7. 1934-45 Samuel Beatty and John L. Synge
8. 1945-52 Samuel Beatty
9. 1952-58 Irving Pounder-Changing Times
10. 1958-68 Daniel B. DeLury
11. 1968-75 George F.D. Duff
12. 1975- Frederick V. Atkinson

T.M. THOMPSON

Error-correcting codes: The beginnings

The purpose of this paper is first to describe, after a brief introduction to coding, the early, unpublished work of R.W. Hamming. This, in turn, is followed by the introduction of M. J.E. Golay, whose work was inspired by that of Hamming through the example of the Hamming (7,4) perfect code cited by C. E. Shannon in his classic treatise on information theory. The priority controversy between Hamming and Golay which ensued because of Hamming's delay in publishing due to patent considerations is discussed in the last section.