Canadian Mathematical Society Winter Meeting
December 10-12, 2005
Victoria Conference Centre, Victoria, BC

History of Mathematics
Org: Len Berggren (SFU)

Saturday December 10

15:30 - 15:55 Glen Van Brummelen, Langford

16:00 - 16:25 Nathan Sidoli, Langford

16:30 - 16:55 Len Berggren, Langford

Sunday December 11

9:00 - 9:25 Alexander Jones, Langford

9:30 - 9:55 Hardy Grant, Langford

10:00 - 10:25 Byron Wall, Langford

History of Mathematics
Histoire des mathématiques
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LEN BERGGREN, Simon Fraser University, Burnaby, BC V5A 1S6
Creating Mathematics Textbooks in the Thirteenth Century: The Case of Nasir al-Din al-Tusi and Aristarchos of Samos

Aristarchos of Samos was a Greek astronomer who worked in the early third century B.C. and wrote a treatise on the sizes of the sun and moon and their distances from the earth. About a century and a half later, beginning with the work of Hipparchos of Rhodes, astronomers began to develop simpler ways of solving the questions that Aristarchos addressed in his treatise. This work continued through Ptolemy some 300 years later, and reached new heights with the trigonometry developed by Islamic astronomers in the 10th century. Yet, in the 13th century, Nasir al-Din al-Tusi, who was well up on the mathematics of his day, produced a new edition of Aristarchos's work that completely ignored all these intervening improvements. Why, and how, Nasir al-Din did this, will be the subject of our talk.

The talk represents joint work with Dr. Nathan Sidoli.

HARDY GRANT, York University, Toronto
The Curious Case of the "Mathematicals" in Greek Antiquity

Plato assigned to mathematics an ontological status intermediate between the realm of Forms and the physical world, and Aristotle based on this tripartition of being an influential classification of knowledge. But Plato placed something else between the intelligible world and physical objects, namely soul; whence, in later centuries, repeated attempts—strange in our eyes—to actually identify soul with the objects of the mathematical sciences. In this endeavour, astronomy—one of the four disciplines considered "mathematical" since the 5th century—played a special role. I shall try to sketch the interplay among these ideas, a story that reaches into late antiquity.

ALEXANDER JONES, University of Toronto
The Euclid Enigma

Euclid is usually said to have lived about 300 B.C. at Alexandria, and he is thought of primarily as a compilator and organizer of older work. I will argue that he was more likely active in the second half of the third century B.C., thus a contemporary of Archimedes and Eratosthenes, and that he was initially best known as an original mathematician working on the problems current in his time. Only in the time of the Roman Empire do we find his name almost exclusively associated with the text for which he is now remembered, the Elements.

NATHAN SIDOLI, Simon Fraser University
Ratio in the Late Ancient Commentators

Ratio was one of the foundations of ancient Greek mathematics. Although a general ratio theory is developed in book five of the *Elements*, Greek mathematical practice was in fact much more diverse than this foundation would suggest. In particular, the theory of compound ratio seems never to have been fully established, despite the fact that the best mathematicians in all fields used compound ratios to produce new results. This lacuna was apparently conspicuous to the late ancient commentators. Both Theon and Eutocius offer meager attempts to give a theoretical foundation to the practices they found in the texts they were studying. Although these discussions are trivial from a mathematical perspective, they introduce interesting and important

shifts in the underlying definitions. These late ancient views were then incorporated into the mainstreams of mathematical practice when they were taken over, and built upon, by the Arabic mathematicians.

GLEN VAN BRUMMELEN, Bennington College
Controversies in the Early History of Trigonometry

Few mathematical disciplines have been claimed to have begun in as many different times and places as trigonometry, covering one and a half millennia and three cultures. When applied to ancient mathematics, the boundaries of the discipline—even the meaning of the word—are obscure and open to different interpretations. The apparently safer ground of Hellenistic Greece is filled with claims and counter-claims of paternity, from Eudoxus to Hipparchus. Later developments are no clearer; spherical trigonometry may go back to Hipparchus, or only to Menelaus over two centuries later. The achievements of Claudius Ptolemy's Almagest are unquestioned, but what Ptolemy contributed (or merely borrowed) is another matter. Finally, the transmission of Greek astronomy to India opens up a series of questions about both cultures. We shall survey the evidence and arguments, with an eye toward establishing a conservative chronology of the subject.

BYRON WALL, York University, 4700 Keele St., Toronto, ON M3J 1P3
John Venn's Opposition to Probability as Degree of Belief

John Venn is known as one of the clearest expounders of the interpretation of probability as the frequency of a particular outcome in a potentially unlimited series of possible events. This view he held to be incompatible with the alternate interpretation of probability as a measure of the degree of belief that would rationally be held about a certain outcome based upon the reliability of testimony and other prior information. This paper explores the reasons why Venn may have been so opposed to the degree-of-belief interpretation, and suggests that it may have been a way for him to resolve a conflict in his own mind between his ideas of proper scientific methods of inference and the religious beliefs that he held as a young man.