Canadian Mathematical Society Summer Meeting
June 3-5, 2006
University of Calgary (Westin Hotel), Calgary, Alberta

Recent Work in History of Mathematics
Org: Tom Archibald (SFU)

Saturday June 3

10:30 - 10:55 Branko Grünbaum, Westin, Reid

11:00 - 11:25 Deborah Kent, Westin, Reid

11:30 - 11:55 William W. Hackborn, Westin, Reid

12:00 - 12:25 June Barrow-Green, Westin, Reid

Sunday June 4

10:30 - 10:55 Laura Turner, Westin, Reid

11:00 - 11:25 Tom Archibald, Westin, Reid

11:30 - 11:55 Marcus Barnes, Westin, Reid

12:00 - 12:25 Reinhard Siegmund-Schultze, Westin, Reid

Recent Work in History of Mathematics
Travaux récents en histoire des mathématiques
(Org: **Tom Archibald** (SFU))

TOM ARCHIBALD, Simon Fraser University
Picard and Integral Equations

The theory of integral equations received a major impetus with the publication in 1900 of Ivar Fredholm's paper, showing the analogy with the solution of systems of linear equations and demonstrating the utility of the theory for the proof of existence theorems to boundary-value problems. A very rapid international reaction followed. In this paper, we examine the work of Émile Picard in this area, beginning in 1902, even before the publication of the French version of Fredholm's paper. Picard's work was particularly influential in France and Italy, and was propagated both through his own lectures and via the textbook of Lalescu.

MARCUS BARNES, Simon Fraser University, 8888 University Drive, Burnaby, BC, V5A 1S6
John Charles Fields as student, researcher, and scientific organizer

John Charles Fields (1863–1932) is best remembered today by mathematicians as the man after whom the Fields Medal is named. Few people realize the Canadian origin of what is arguably the most prestigious award in mathematics. In this talk, I will present a preliminary sketch of Fields' life and work. First we will discuss Fields as a student; then Fields as researcher; and finally, in many ways most importantly, Fields as a scientific organizer.

JUNE BARROW-GREEN, Centre for the History of the Mathematical Sciences, The Open University, Walton Hall, Milton Keynes MK7 6AA, UK
Mathematics and pacifism in Cambridge 1915–1916: a student perspective

¿From January 1915 to July 1916 the Cambridge mathematics student F. P. White kept a detailed diary in which he freely recorded all aspects of his life. During this period White came top in the Mathematical Tripos, embarked on postgraduate research in applied mathematics and appeared in front of several Appeal Tribunals as a conscientious objector. White's diary not only includes vivid descriptions of the mathematics he studied and the mathematicians with whom he associated but it also provides an insight into the intellectual environment of the Cambridge pacifist milieu (Bertrand Russell *et al.*) to which he belonged.

BRANKO GRÜNBAUM, University of Washington, Seattle, WA 98195, USA
Polygons: Meister was right and Poinsot was wrong but prevailed

In a 1770 paper, A. L. F. Meister gave a quite general definition of "polygon", and introduced other important concepts (such as the winding number of a curve or polygon about a point). His paper (in the Novi Comm. Goetting.) had no immediate influence, although it is mentioned much later by Moebius and others; most mentions misinterpret the definition. The approach to polygons proposed independently by L. Poinsot in 1809 became widely known and generally adopted, possibly because he used it to find the four regular star polyhedra (usually known as Kepler–Poinsot polyhedra); somewhat later A.-L. Cauchy proved that these are the only possible ones. As it turns out, Poinsot's approach is internally inconsistent, needlessly restrictive, and leads to many exceptions and loss of continuity in the types of polygons and polyhedra. Meister's approach avoids these, and can serve as the starting point of a general theory of polygons and polyhedra, in a way that is very much in tune with modern research of these topics. It is hard to understand why—despite its shortcomings and inconsistencies—Poinsot's definition is still the one relied on almost exclusively. The talk will describe the two definitions, point out the problems with Poinsot's, and illustrate the simplifications obtained by Meister's.

WILLIAM W. HACKBORN, University of Alberta, Augustana Campus, Camrose, Alberta T4V 2R3
Mathematical Ballistics up to World War I

G. H. Hardy wrote in his *Apology* that ballistics and aerodynamics are "repulsively ugly and intolerably dull" and also expressed ethical concerns about the use of mathematics for military purposes. Nevertheless, Hardy was largely an exception for his time, as many of his contemporaries, including O. Veblen and Hardy's long-time collaborator J. E. Littlewood, contributed to the science of exterior ballistics, the application of mathematics to projectile motion. This paper will look at significant work in mathematical ballistics during the late 19th and early 20th centuries, focusing especially on the influential theory of Turin professor F. Siacci and the ideas Littlewood developed as a second lieutenant in the Royal Garrison Artillery during World War I.

DEBORAH KENT, Simon Fraser University, Department of Mathematics, 8888 University Drive, Burnaby, BC V5A 1S6
Fractions, Plants, and Planets: Extending the 19th-Century Law of Phylotaxis

In the mid-nineteenth century, American mathematician Benjamin Peirce related contemporary plant morphology to developing planetary theory by extending the so-called "law of phylotaxis" that expressed the arrangement of leaves on plants as a series of fractions. Peirce discovered an identity between this arrangement and planetary revolutions. His result, and its place in subsequent arguments, illustrate one use of mathematics in a nineteenth-century scientific environment based on the conviction of certainty in the universe.

REINHARD SIEGMUND-SCHULTZE, Agder University College, Kristiansand, Norway
German refugee-mathematicians in Canada

The talk will look at the role of Canada in accommodating refugees from the Nazi purge. This concerns on the one hand the mechanisms of emigration where Canada had a particular function, for example in securing re-entry visa to the United States. On the other hand, and to a much smaller extent than the U.S., mathematics in Canada itself profited from immigration, with the group theoretic school of Richard Brauer in Toronto being the biggest success, although Brauer left for the U.S. in 1948. Brauer's case will be examined in some detail while others (Peter Scherk, Alexander Weinstein, Hans Schwerdtfeger, Hans Heilbronn, and George Lorentz) will be mentioned passingly. The cases of Schwerdtfeger and Heilbronn, who came respectively in 1957 and 1964 from Australia and England, shows the more indirect consequences of the emigrations from Europe. To complete the picture one would have to include second generation emigrants (children of emigrants having their mathematical education in the New World) and those coming after the war directly from Germany (G. Lorentz and others) due to economic hardships and scientific isolation there. The talk is part of a book on German refugee-mathematicians which came out in 1998 in German and will be published in an extended English version with Princeton University Press.

LAURA TURNER, Simon Fraser University
The Origins of the Mittag-Leffler Theorem

The Swedish mathematician Gösta Mittag-Leffler (1846–1927) studied as a "post-doctoral" student in Paris with C. Hermite and in Berlin with K. Weierstrass between the years of 1873 and 1876, when Weierstrass published his influential *Zur Theorie der eindeutigen analytischen Funktionen*. During this period of time, Mittag-Leffler elaborated upon this work of Weierstrass' and proved the now-familiar theorem (in present-day notation) associated with his name:

Suppose Ω is an open set in the plane, $A \subset \Omega$, A has no limit point in Ω, and to each $\alpha \in A$ there are associated a positive integer $m(\alpha)$ and a rational function

$$P_\alpha(z) = \sum_{j=1}^{m(\alpha)} c_{j,\alpha}(z-\alpha)^{-j}.$$

Then there exists a meromorphic function $f \in \Omega$, whose principal part at each $\alpha \in A$ is P_α and which has no other poles in Ω.

In this paper I will briefly present a background to the *Mittag-Leffler Theorem*, including the work of Weierstrass regarding entire functions. I will then discuss Mittag-Leffler's extension of these results to the existence of a meromorphic function with arbitrarily assigned principal parts. Finally, I will investigate Hermite's reception of Mittag-Leffler's theorem through their correspondence (of which Hermite's letters have survived) and his addition of the Mittag-Leffler theorem to his lecture material.