Oxford Mathematics

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Institute of mathematics & its applications

THE QUEEN'S COLLEGE
UNIVERSITY OF OXFORD

Meeting in Memory of Peter M. Neumann

Saturday 9 April 2022
Shulman Auditorium, The Queen's College, Oxford
and online via MS Teams

All times are BST; talks marked with an asterisk will be delivered remotely.

Programme

09:45	Welcome and housekeeping	
09:50	RAYMOND FLOOD Kellogg College, Oxford	*A Tribute to Peter M. Neumann*
10:00	CHERYL E. PRAEGER AC University of Western Australia	*Peter Neumann's Contributions to and Influence on Group Theory**
10:30	TONY MANN University of Greenwich	*Working with Peter on Burnside Matters*
11:00	CHRISTOPHER HOLLINGS University of Oxford	*How Do We Know What We Know About Ancient Egyptian Mathematics?*
11:30	Refreshment break	
12:00	PHILIP BEELEY University of Oxford	*Revisiting Fermat: John Wallis and the English Reception of Number Theory in the Second Half of the Seventeenth Century*
12:30	BENJAMIN WARDHAUGH University of Oxford	*Hutton's Books: The Best Mathematical Library in England and its 1816 Dispersal*
13:00	Lunch	
14:00	BRIGITTE STENHOUSE University of Oxford/ The Open University	*Quaternions at Twilight: Mary Somerville's Studies of Non-commutative Algebra**
14:30	ADRIAN RICE Randolph-Macon College	*Peter, Parallels and Paradoxes**
15:00	KAREN PARSHALL University of Virginia	*The Lay of the American Algebraic Landscape in the 1920s**
15:30	Refreshment break	
16:00	CIARA KENNEFICK Christ Church, Oxford	*Mathematics and Fairness in French Contract Law, c.1700 to c.1900*
16:30	PETER J. CAMERON University of St Andrews/ Queen Mary, University of London	*A Bridge Between Group Theory and Combinatorics*
17:15	MARTIN R. BRIDSON University of Oxford	Closing remarks
17:30	Drinks reception	

Abstracts

Philip Beeley (University of Oxford)

Revisiting Fermat: John Wallis and the English Reception of Number Theory in the Second Half of the Seventeenth Century

When John Wallis was presented with the challenge of solving certain problems in number theory by Pierre Fermat in 1658, he at first completely misjudged their mathematical significance. Within a decade, however, we find the Savilian professor of geometry at Oxford seriously engaging with such problems as Fermat's 'negative theorem' in manuscript and published works. The talk will seek to assess Wallis's investigations and to situate them within the context of a burgeoning interest in Diophantine analysis prompted in part by Samuel Fermat's long awaited re-impression of Bachet's edition of the *Arithmetica* with his father's notes in 1670.

Peter J. Cameron (University of St Andrews/Queen Mary, University of London)

A Bridge Between Group Theory and Combinatorics

When I arrived in Oxford as a DPhil student in 1968, Peter gave me his manuscript on primitive permutation groups of degree $3p$ to study. This was a fortunate chance for me, since the manuscript developed links between ideas from algebra (Schur rings) and combinatorics and statistics (association schemes). Although the paper was never published, it contains material which is of interest beyond the classification of permutation groups.

Christopher Hollings (University of Oxford)

How Do We Know What We Know About Ancient Egyptian Mathematics?

I will speak about a project that was strongly encouraged by Peter, and which began with a chance find in a library in Oxford. After briefly establishing some background details, I will give a whistle-stop answer to the question posed in the title, beginning in the ancient world and ending in the early twentieth century. A central theme of the later parts of the story will be the comparison of how Egyptologists and mathematicians have approached the subject of ancient mathematics, and what they have sought from it.

Ciara Kennefick (Christ Church, Oxford)

Mathematics and Fairness in French Contract Law, c.1700 to c.1900

For centuries, certain contracts have been undone in France if the price was unjust: the paradigm case (derived from Roman law) is the sale of land at less than half of its value. Although the theory was invented after the rule, the latter is a practical manifestation of the fundamental principle that a contract facilitated the exchange of things of equal value. Instead of a fixed capital sum, the price was, frequently, an annuity for the life of the vendor. Equally, the land which was sold was, often, an interest in land for a life. In the two centuries from c.1700 to c.1900, probability was developed by leading mathematicians and applied to various legal issues, particularly contracts depending on the length of lives. The French side of this story reveals much about the history of mathematics and the history of law. This paper adds to the existing literature in three significant ways: first, it shows that French mathematicians were (surprisingly) well-versed in law and understood the significance of the rule on just prices in contract; secondly, it shows that — and explains why — the mathematical ideas were not embraced by lawyers (in court or in scholarship); thirdly, it highlights the influence of English mathematics on French thinking in this area.

Tony Mann (University of Greenwich)

Working with Peter on Burnside Matters

I had the privilege of working with Peter Neumann on three projects connected with our mutual mathematical hero William Burnside.

We jointly organised a BSHM meeting celebrating the centenary in 1997 of Burnside's *Theory of Groups of Finite Order*. This meeting was held at what was then the Royal Naval College in Greenwich (where Burnside spent most of his working life). Following that meeting Peter, Julia Tompson and I edited *The Collected Papers of William Burnside*, a project which Peter instigated and led with his customary charm and competence. Finally Peter wrote a chapter on Burnside for the book which Raymond Flood, Mary Croarken and I edited, *Mathematics at the Meridian: a history of mathematics at Greenwich*.

This talk will, I hope, convey the pleasure of working on these projects with Peter.

Karen Parshall (University of Virginia)

The Lay of the American Algebraic Landscape in the 1920s

As Oswald Veblen noted in 1926, 'finite group theory and its applications to algebraic equations' had come to the United States in an 'intense wave' that had originated in Europe and had come ashore in the United States in the 1880s. By the 1920s, finite group theory had been joined by the theory of linear associative algebras to define the research agenda of American algebraists. In homage both to Peter Neumann's work in group theory and to his encouragement that I pursue a book-length study of the American mathematical research community from 1920 to 1950, this talk will give an overview of American contributions to algebraic research in the 1920s.

Cheryl E. Praeger AC (University of Western Australia)

Peter Neumann's Contributions to and Influence on Group Theory

Peter Neumann made fundamental contributions to diverse branches of Group Theory: permutation groups, varieties of groups, statistical, combinatorial, and computational aspects. He called himself a mathematician historian, estimating his focus as 80% mathematician and 20% historian. Peter had a keen interest in the context and history of results in group theory, evident already in his DPhil thesis. I will speak about some of the mathematics which benefited tremendously from Peter's historical work.

Adrian Rice (Randolph-Macon College)

Peter, Parallels and Paradoxes

Peter Neumann was a master of mathematical exposition. For example, in 1987 he received a major award for expository excellence from the Mathematical Association of America—for a book review. As with everything else he published, Peter's book reviews were models of scholarly exposition, thoughtfully constructed and beautifully worded, in which his encyclopedic knowledge was matched by his charm and wit. By looking at Peter's work through the lens of his insightful reviews, this talk draws analogies between his activities in this area and a treasured book in his possession of which he was quite fond.

Brigitte Stenhouse (University of Oxford/The Open University)

Quaternions at Twilight: Mary Somerville's Studies of Non-commutative Algebra

In 1871, when Mary Somerville was 90 years old, she received a copy of Peter Guthrie Tait's *Elementary Treatise on Quaternions*. The book was sent to her by then-president of the London Mathematical Society, William Spottiswoode, to whom Somerville had written when looking for book recommendations on the 'higher algebra'. During her reading of Guthrie Tait, she took extensive notes, jotted down onto loose sheets of paper, sheets which are now held in the Somerville Collection at the Bodleian Library, Oxford. Using these archival sources I will detail Somerville's first documented engagement with the study of non-commutative algebra, and relate this to her earlier work in mathematics.

Benjamin Wardhaugh (University of Oxford)

Hutton's Books: The Best Mathematical Library in England and its 1816 Dispersal

Charles Hutton (1737–1823) collected books from his childhood onwards, and by the time of his retirement owned what he and his friends believed was the best mathematical library in England. Following a misunderstanding with the British Museum, the collection was dispersed at auction in 1816, and few of the books can now be located. I will discuss my recently completed online catalogue of the library based on the printed sale catalogue as well as its manuscript predecessors, and say something about what it does and does not reveal about the British mathematical culture in which Hutton lived.

Acknowledgements

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