BAMC minisymposium: Conflicting Attitudes in the History of Mathematical Science
26-29 March 2018, St Andrews

Abstracts

Alex D.D. Craik (St Andrews): ***The Hydrostatics of George Sinclair and Robert Boyle***

The hydrostatical writings of the little-known George Sinclair and the famous Robert Boyle reveal an equivocal attitude to the employment of mathematical theorems in physical science. Both rightly rejected the philosophical speculations of various contemporaries that were not founded on experimental observation (notably those of Thomas Hobbes and Franciscus Linus). Their own approach was that of "experimental philosophy": Sinclair's "Theoremes" are based on physical observations rather than on mathematics.
Later anonymous and harsh criticisms of Sinclair by the mathematicians James Gregory and William Sanders favoured the earlier mathematical approach of Archimedes and Stevin.

Ref: A.D.D. Craik, 'The hydrostatical work of George Sinclair…', forthcoming, *Notes & Records of Roy. Soc. Lond.*

Isobel Falconer (St Andrews): ***Maxwell, Kelvin, and the inverse square law of electrostatics***

In 1877 James Clerk Maxwell and his student Donald McAlister refined Henry Cavendish's 1773 null experiment demonstrating the absence of electric charge inside a charged conductor. The inverse square law of electrostatics predicted this absence, and both Cavendish and Maxwell took the experiment as verifying the law.

However, Maxwell, and his friend William Thomson (later Lord Kelvin), had previously expressed absolute conviction in the law, based on results of Faraday's. So why did Maxwell bother to repeat Cavendish's experiment?

To answer this question, I will focus on the mathematical tradition within which Maxwell and Kelvin were working, and the logic of the experimental evidence for the law. I set these in the context of contemporary British attitudes to the inverse square law, and conclude that the status of the law was less secure than Maxwell and Kelvin would have us believe. The presentation of the experiments was a rhetorical move in an attempt to generate an apparently rigorous mathematical foundation for electrical science, as well as a British genealogy for such an approach.

Ben Marsden (Aberdeen): ***William John Macquorn Rankine (1820-1872) and the making of engineering science in nineteenth-century Glasgow***

This talk explores the interface between mathematical and practical engineering in the third quarter of the nineteenth century, through the example of W. J. Macquorn Rankine, professor of civil engineering and mechanics at the University of Glasgow from 1855 to 1872 and author of an influential series of 'manuals' of engineering science. The paper sets Rankine's early life as a practical engineer, his forays into the new science of thermodynamics in the early 1850s, and his extensive publications in and beyond 'applied mechanics' against contemporary attempts to bring the training of British engineers into universities and colleges from the late 1830s onwards. Though Rankine insisted his mission was to build a bridge between 'theory' and 'practice', by developing the art of applying scientific principles to practice, working engineers often found him incomprehensible and,

indeed, readily dispensable. Even committed advocates of mathematical engineering science found it necessary to digest Rankine's copious but dense writings for the common intellect.

Mark McCartney (Ulster): *'Graecum est legi non potest': James Thomson Snr and the teaching of arithmetic, trigonometry and calculus in early 19th century Belfast*.

James Thomson Sr, father of Lord Kelvin, was both school teacher and college professor of Mathematics in Belfast from 1814/5-1832. During his time in the town he wrote a number of textbooks, and these, combined with correspondence and examination questions allow us to use them as a case study in the teaching of mathematics in the early 19th century.