

Susan M. C. Mac Donald: Euclid Transmogrified: A National Scandal,
Logic Press, 2024.
ISBN: 978-1-4461-5218-8, EUR 34.07/24.64 Hardcover/Paperback,
529+xvi pp.

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As the title suggests this book details a national scandal centred on Euclidean geometry in schools. Specifically, the book is concerned with changes to the geometry syllabus for the Inter. Cert. and later the Junior Cert. from the 1940s to the late 1980s and how these changes were influenced by the opinion of the Department of Education inspectorate rather than professional mathematicians and teachers. What is particularly surprising is the length of time these problems were allowed to persist across two syllabuses from the mid 1960s to the late 1980s with ramifications that extend to the present day.

Mac Donald has split the book into four sections: Setting, Phase One, Phase Two, and Aftermath. The first of these, Setting, places a recently independent Ireland in a changing world mathematically when it comes to geometry education. At the time Ireland was primarily promoting the education of the Irish language and had separate Intermediate Certificate mathematics for boys and girls, with the girls' syllabus called 'Elementary Mathematics (for girls only)' and of a lower standard than the 'Mathematics' syllabus for boys. I found this to be a very interesting and accessible introduction to the state of education in Ireland post-independence. Some aspects of this will be familiar to many readers but that does not detract from the book and undoubtedly there will still be something new for everyone.

At the time, an international debate was taking place about how to reform the mathematics syllabus in secondary schools. Some mathematicians endorsed models that sought to 'fix' Euclid such as Hilbert's axioms, whereas others sought to replace the geometry of Euclid with a linear algebra based approach. Georges Papy was a prominent figure in the latter movement.

The Phase One section of the book outlines how the Department of Education inspectorate reacted to these international developments and the policy of the government of the day. The resulting syllabus, which Mac Donald calls Syllabus II, had some positive aspects: it removed 'Elementary Mathematics (for girls only)', it ran at a lower and higher level ensuring girls had access to the more advanced material, while less able boys could take the lower level. This also happened at a time when secondary education became free to Leaving Certificate level, and a common Intermediate Certificate was introduced for secondary and vocational schools. However, for the geometry content of Syllabus II, the inspectorate developed a hybrid system where existing aspects of Euclid ran alongside parts of Papy's mathematics.

Syllabus II was met with a large number of teachers who were unfamiliar and unprepared to teach this new mathematics, while no textbook in English was available to teachers of Syllabus II until two years after its introduction. This resulted in a lot of confusion for teachers and for students.

Received on 05-06-2025; revised 09-06-2025.
DOI: 10.33232/BIMS.0095.68.69.

In Phase Two, Mac Donald outlines the development of Syllabus III. After seven years of Syllabus II, the Department of Education inspectorate decided to double-down on the use of Papy's mathematics in places, while also not following it entirely. Papy's mathematics seems to require being followed precisely or not at all. This led to a logically unsound mathematics syllabus with undefined terms and theorems that could not be proved from the course material. This happened against the protests of many university lecturers, most notably Prof. Anthony O'Farrell and Prof. Patrick Barry, who were quick to point out the flaws within Syllabus III. Yet despite all this, Syllabus III ran for fourteen years. This seems to be due to a concentration of power in the inspectorate when writing these syllabuses. The inspectors seemed to be confident in their ability to design a mathematical system by borrowing parts from several others. They did not recognise the flaws in their system, and were unwilling to listen to any dissenting voices from professional mathematicians when they pointed out these flaws. The inspectorate did not feel they needed to listen to these mathematicians because students sitting the Inter. Cert. were not going directly to university and these were therefore none of their concern.

The fact that this could happen in the first place and then persist for so long is, as Mac Donald states, a national scandal. The ramifications of these syllabuses are still being felt today with elements of them remaining in subsequent syllabuses and many of the teachers working today having themselves been taught with this flawed geometry.

The book is extremely well-researched. To support her work Mac Donald uses summaries of committee meetings, articles, conference reports, records from the Dáil, and interviews. These sources add a lot of colour to the argument. However, at times, particularly in the Phase One and Phase Two sections of the book, it can be difficult to keep track of the various timelines and organisations. For a book that provides a detailed history on a topic spanning about fifty years, this is probably inevitable. It is worth persevering through these periods as Mac Donald does tie things together in the end and she helpfully provides a list of all the abbreviations at the beginning of the book. The book is also nicely supplemented with appendices of the geometry syllabuses discussed and extracts from the various geometric models that were under consideration.

I think anyone with an interest in the history of secondary school education in Ireland would find this to be a good and insightful read.

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