

A Century of Mathematical Reform

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The Mathematical Association celebrates its centenary this year with a conference to be held at University College, London, on April 14-16. The programme will include lectures and discussions, and the library of University College will display some of its rare and ancient mathematical books. In this article, a former President of the Association outlines its beginnings and traces its subsequent development.

THE issue of *Nature* for May 26, 1870, contained a short letter suggesting the formation of an anti-Euclid society. The writer was Rawdon Levett, mathematics master at King Edward's School, Birmingham; his iconoclastic proposal represented the opinion of a growing number of teachers, that the current practice of forcing school children to learn Euclid's text by rote, with or without any understanding of its content, was simply barbarous. Levett's idea was taken up by other reformers; among them was J. M. Wilson, later a Canon of Worcester but at this time a mathematics master at Rugby, where the headmaster, F. Temple, afterwards Archbishop of Canterbury, was pressing for a new look in school geometry. Another supporter was Professor T. Archer Hirst, then at University College, London, but shortly to become the first Director of Studies at the newly established Royal Naval College, Greenwich. An Association for the Reform of Geometrical Teaching was founded and held its first formal meeting of some two dozen members on January 17, 1871, at University College, with Hirst in the chair and Levett as secretary. Almost immediately, "improvement" was substituted for "reform" in the title, perhaps lest the members should be classed among the wild radicals of the time. The change did little to propitiate opponents, particularly well entrenched at Oxford and Cambridge; the Oxford don, C. L. Dodgson, better known as Lewis Carroll, in his satirical play, "Euclid and his modern rivals", was wittier but no less reactionary than many other school and university teachers. Not until about 1900 did the two older universities relax their euclidean requirements for entrance, after a struggle in which A. R. Forsyth was a leader of the reformers.

In its early years, the AIGT naturally devoted its principal energies to the task of replacing Euclid by an arrangement and development of geometrical ideas more suitable to the needs of school children. But as its numbers grew, its aims widened to include all mathematics in the middle and upper school range; this expansion was recognized by a change, in 1897, to the present name of the Mathematical Association. Moreover, in response to a suggestion by some members that the Association's aims and activities should be given more publicity, a journal was founded, the *Mathematical Gazette*, the first number appearing in April 1894: number 392, to appear in April 1971, will be a special issue to celebrate the Association's centenary.

The engineer, John Perry, preaching to the British Association in 1901, denounced the divorce of school and university mathematics from the mathematics required by the engineer and technologist. Forsyth headed a committee of investigation, while as President of the Mathematical Association in 1903-4 he encouraged a parallel development urged by some influential schoolmaster members of the Association, to systematize and intensify the Association's efforts to improve and publicize methods of mathematical teaching. A standing Teaching Committee was charged with the duty of constantly reviewing the progress of methods of teaching and of providing reports on their investigations. Some small reports appeared before 1914, but the full force of this policy began to be felt in 1923 with the *Report on the Teaching of Geometry in Schools*. A powerful team, led by T. P. (later Sir Percy) Nunn and E. H. Neville, produced a scholarly but practical document which initiated a revolution in geometrical teaching in this country. Since then, almost every branch of school mathematics has come under the scrutiny of the Teaching Committee and its reports have been accepted here and overseas as constructive and authoritative. A feature of recent work has been an extension to the field of the primary school, culminating in the 1970 report on primary mathematics, so that now the whole range of mathematical teaching in the schools is covered. Recent developments, such as the drastic revision of the school syllabus, and preparations for metrication, have been studied with care. A new journal is about to be published; it will concentrate chiefly on the more elementary stages of mathematical teaching, while the *Gazette* will then deal mostly with the more advanced levels.

The policy of establishing local branches, each with its own programme of meetings and discussions, began before 1914 and developed rapidly between the wars; there are now more than 30 such branches in this country, as well as several in other parts of the Commonwealth. The Association's library, built up almost wholly by gifts and exchanges, contains much material related to mathematical education, and is particularly rich in its collection of periodicals concerned with the history and teaching of mathematics. The library is housed in the University of Leicester and an efficient postal service to members is supplied.

A post-war development of importance has been the establishment of the Association's Diploma in Mathematics, giving a qualification now officially recognized for a "merit" allowance. The standard is approximately that of one year of full-time study beyond A-level; the curriculum contains not only the standard branches of elementary mathematics, as at present interpreted, but also statistics, and the history and development of mathematical ideas. Teachers in service have found that through the Diploma they can add considerably to their teaching range, and thus this activity has done something to mitigate the present shortage of mathematics teachers.

The Association's urgent need at the moment is for a home of its own, without which it can no longer adequately cope with its many and growing activities. Preliminary plans have made good progress, so that all that is now required is a sufficient sum of money; an appeal will be launched as part of the centenary celebrations. If the response is generous, the Association can embark on its second hundred years with confidence and enthusiasm.