

## The Future for UK Mathematics Subject Associations

by Sue Pope

Recently, I was invited to speak at a meeting of teachers involved with subject associations in Estonia. Subject associations are new phenomena in Estonia, where they have been charged to support the implementation of the new curriculum, which has a focus on the development of the whole person, active learning and cross-curricular approaches. It gave me an opportunity to reflect on the current situation, how we got here and what the future might be.

Subject associations have been part of the UK educational establishment since the Association for the Improvement of Geometrical Teaching (AIGT) was established in 1871 (Price, 1993). They followed the establishment of subject learned societies during the 19th century, for example the London Mathematical Society (LMS) in 1865. Although the learned societies were concerned with education (for example LMS continues to have an education committee), they did not concern themselves with the teaching of the subject in school. The original subject associations were made up largely of teachers in boys' public schools, but also included members from university and the military academies. Prior to the establishment of the Institute of Mathematics and its Applications (IMA) in 1964, The Mathematical Association (as AIGT was to become) also included professional mathematicians amongst its members. Preparation for university entrance exams and the nature of those exams was a key concern.

The AIGT's aim was to make geometry practical and understandable and to move away from rote learning of Euclid's *Elements*. Schools developed practical laboratories for teaching geometry and some of the geometry textbooks produced by members at the turn of the 20th century were novel and exciting, yet carefully crafted to secure rigorous understanding (Fujita and Jones, 2003). In 1895 AIGT began publishing the *Mathematical Gazette*, which continues today to have articles on mathematics of interest to sixth form and undergraduate mathematicians and their teachers. The proportion of articles concerned with teaching has diminished over time. In 1897 AIGT became The

Mathematical Association (MA). It concerned itself principally with the teaching of mathematics in public and grammar schools to boys, focusing on improved textbooks, teaching aids such as squared paper and tables of logarithms, and exam reform. Between 1902 and 1908 the MA had a recruitment drive, developing and establishing branches across the country, and by 1925 it had 1000 members.

A girls' school special committee was established in 1912 and by 1914 the MA's membership was 20% women. Women took more of a role in the MA and in 1916 the MA decided that all future reports needed to take account of both girls and boys. Although the school leaving age was raised to 14 in 1918 the MA continued to largely concern itself with the mathematical education of the elite. It was only in the 1940s that a primary committee was established and some time after that a committee for teaching aids in mathematics. Caleb Gattegno was a member of both of these committees.

The MA had produced authoritative reports on teaching mathematics in public and grammar schools covering all aspects of mathematics relevant to selective secondary schooling. These reports were thoroughly researched and set the standards for school mathematics. However, few MA members worked in the schools attended by most young people, so their attempts to prepare reports on primary mathematics and teaching aids in mathematics – largely aimed at post-primary teachers – were less successful, and took several years.

In 1952 Gattegno established the Association for Teaching Aids in Mathematics (ATAM). The express aims were to promote the use of teaching aids in mathematics and to teach mathematics as an area for exploration and discovery. The ATAM promoted teaching aids and active approaches to learning through demonstration lessons and encouraging local groups of teachers to work together. ATAM attracted members from a wide range of schools, particularly secondary modern and primary, and within a year had 1000 members. From 1955 it published *Mathematics Teaching*,

which has continued to be the voice of the association's members and an important means of sharing ideas and understandings. In 1962 the ATAM became the Association of Teachers of Mathematics (ATM) and was at the forefront of developments in teaching and learning mathematics for learners in state-funded schools. Rather than producing authoritative reports on mathematics, ATM nurtured a community focused on improving the learning and teaching of mathematics for all learners through a community of enquiry.

Although the two associations had distinctive memberships and affiliations at the national level, at local level collaboration and cooperation was relatively commonplace. In 1969 of MA's 27 branches, eight were joint with ATM. Today ATM has ten branches, MA eleven and many meet together. The MA undertook a root and branch review in its centenary year. Recognizing the *Mathematical Gazette* as a valuable publication in its own right, but that teaching in schools was no longer its focus, the MA established *Mathematics in School* as a magazine for teachers of mathematics in 1971. It also adapted the format of its conferences to include a greater variety of sessions, more closely resembling the lively format of the ATM's conferences.

Over the last twenty years the ATM and MA have held a number of joint conferences. The first joint conference was held at Nottingham University in 1992. There were some who saw this as the beginning of a much closer collaboration and at the time Alan Bishop (1990) set out four reasons why the MA and ATM should consider merger:

- A united community involving all sectional interests.
- The need for one voice to influence policy makers.
- Optimization of human effort.
- Rationalization of finance and administration.

A few years earlier, a survey of conference delegates by Neil Bibby (1988) found that 40% of MA delegates were in favour of a merger whilst just 25% of ATM delegates were in favour. At AGMs of the two associations in 1994 the MA voted in favour of a survey of members to explore the possibility of a merger, the ATM voted against. The MA survey had 1030 respondents with 954 in favour and just 55 against (MA Newsletter, June 1994). Things have been relatively quiet ever since.

It was another seven years before the second joint conference in Liverpool. Joint conferences are significantly larger than either of the individual subject association conferences and the administration and finances rarely straightforward. The British Congress of Mathematics Education (BCME) was established in 1991 as a conference to bring the UK mathematics education community together in the four-year interval between Internal Congresses on Mathematical Education (ICME). BCME is organized by the Joint

Mathematical Council (JMC). The first BCME took place in Loughborough during the summer and was reasonably successful. The subsequent BCMEs struggled to recruit, so JMC decided to ask the subject associations if they would be prepared to work together to make BCME a truly joint conference of all the mathematics subject associations. This was agreed and in 2005 a successful BCME was held in Warwick during the Easter break, followed by BCME 6 in 2010 in Manchester. These conferences have had healthy recruitment. The table below shows the mathematics education national conferences 1991–2012. (See table on next page.)

In 1985 Mike Price wrote about the dilemma faced by tutors of initial teacher education students: membership of a subject association is desirable for the aspirant professional – but why should student teachers have to choose ATM or MA? Fifteen years earlier Arthur Dodd had raised a similar concern and suggested the possibility of joint membership. Even today ITE tutors face the same dilemma, although many encourage students to pair up and join one each. Teachers and students faced with a choice often decide to 'not bother'.

Over the last forty years the MA and ATM have become much more similar and have worked together in some instances. The MA and ATM now draw members from all sectors of school mathematics teaching and they have many shared goals such as all learners of mathematics understanding and enjoying their experiences at school. They also face similar challenges:

- How to recruit and retain younger members.
- How to attract primary members.
- How to remain financially viable.
- How to sustain local branch activity.
- How to influence national policy in a principled way.

Unlike the ATM, the MA doesn't have a fixed term of office for its trustees provided they take on different responsibilities. ATM has a further challenge of ensuring a supply of volunteers prepared to put time and energy into running the association. The MA invested in a permanent physical base for the association in 1975 and although this property needs maintenance, it provides a regular income from a flat, which is let. ATM doesn't have a physical base and its lease on its Derby premises expires in a few years time. ATM will need to consider what sort of premises it needs for the future: should it purchase a property for long-term security – like the MA and several other organizations – approach a university to act as host – like the Association for Language Learning – or obtain another long-term lease?

Currently there is a joint ATM/MA primary committee, which responds jointly to recent reviews of primary mathematics teaching and the primary curriculum. MA and NANAMIC have a joint post-16 committee, organizing joint events and producing a newsletter.

Year	ATM	MA	BCME	Joint
1991	Cheltenham	Newcastle upon Tyne	Loughborough	
1992				Nottingham
1993	Lancaster	Plymouth	Leeds	
1994	Ripon	London		
1995	Cheltenham	Sussex	Manchester	
1996	Lancaster	Leeds		
1997	Oxford	Strathclyde		
1998	Ripon	Warwick		
1999			Northampton	Liverpool
2000	Oxford	Exeter		
2001	Chester	Lancaster	Keele	
2002	Ormskirk	Reading		
2003	Bath	Norwich		
2004	Loughborough	York		
2005			Warwick	
2006	Ormskirk	Loughborough		
2007	Loughborough	Keele		
2008				Keele
2009	Swansea	Cambridge		
2010			Manchester	
2011	Telford	Loughborough		
2012	Swansea	Keele		

Soon after the NCETM was established a Meeting of Mathematics Subject Associations (MMSA) was convened to bring together MA, ATM, NANAMIC (Note 1) and AMET (Note 2) as their members were primarily concerned with mathematics education in schools across all phases. Some work was undertaken on closer collaboration and a document prepared for consideration by members of MA, ATM, NANAMIC and AMET in 2009; again this didn't go anywhere. MMSA continues to meet.

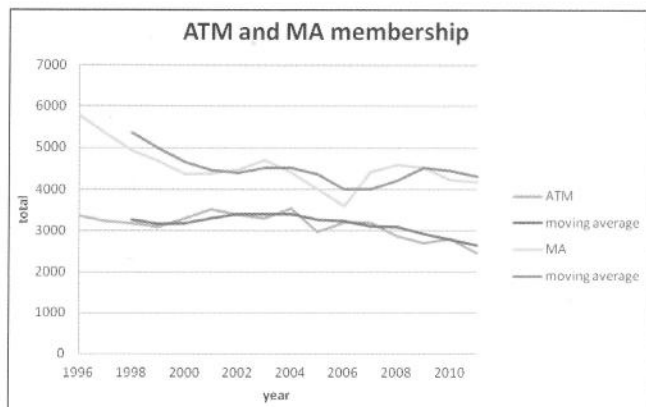
This is not the first time the mathematics subject associations have had a regular meeting. The Joint Mathematical Council was established in 1963 to provide a single voice for mathematics, but ATM, MA, the National Association for Mathematics Advisers (NAMA, established in 1974) and the precursors to AMET established the *Standing Conference of Associations concerned with Mathematics Education in Schools*

(SCAMES) in the 1970s. This was because of concerns that JMC was overly focused on university mathematics and the mathematicians of the future. It is not clear what SCAMES achieved as MA and ATM each made separate contributions to the Cockcroft committee and to the development of the national curriculum, which were significant developments during its existence.

In 1982 Cockcroft reported that "a disappointingly small proportion of those who teach mathematics in school belongs to" ATM or MA (Para. 730). Of 30 000 secondary teachers and many more primary teachers, there were 12 000 members of the MA and ATM together, of which 3000 belonged to both. There are probably even more teachers of mathematics today, yet the current memberships are less than 3000 for ATM and just over 4000 for MA. Linda Haggarty took an opportunistic sample of 51 secondary mathematics teachers in 1992, finding approximately 20% were members of either MA



or ATM and concluded that “a significant number of mathematics teachers are not members of the associations”. Over the last 15 years both associations have seen membership fall by 27% (see the graph below).



I am grateful to MA and ATM for providing the data for this graph.

Clearly the proliferation of associations concerned with mathematics education in schools and the establishment of the National Centre for Excellence in Teaching Mathematics (NCETM), following Smith's recommendations in 2004, have not helped with recruitment. I believe NCETM could have helped a great deal more had it acted as a conduit to subject associations rather than establishing itself as a one-stop shop for teachers. Whilst there are many valuable resources and facilities on the NCETM portal, publishing regular magazines for primary and secondary mathematics undermines the subject associations' publications. Many teachers do not appreciate that NCETM is a government-funded initiative, whilst subject associations are independent organizations.

Mathematics is not typical of other subject associations. In 1963 teachers of science formed the Association of Science Education (ASE), the largest subject association with approximately 16000 members currently. Teachers of foreign languages joined forces in 1990 to form the Association for Language Learning (ALL), which currently has about 5000 members. These subject associations have within their organizational structure specialist areas such as ITE tutors, and subject advisors and consultants and are able to speak with authority on all aspects of education in their subject.

The National Association for Teachers of English (NATE, formed 1963) is a strong organization that recognizes “the child's needs should be at the centre of the debates about what the subject should be” (Gibbons, 2011, p.10) and that “the strength of NATE rests in the work of the countless committed individuals who contribute to its activities” (ibid, p.11). Simon Gibbons (chair of NATE) asserts that NATE will survive the political fashions because of its commitment to exploring the nature of the subject and how it is learned,

themes that resonate strongly with ATM's aims. In the same issue of the NATE magazine, the director, Ian McNeilly, argues that ‘our time has come again’ and that all teachers should be encouraged to consider membership of a subject association for a number of reasons including:

- Removal of local authority support and the end of the National Strategies and the General Teaching Council (GTC(E)).
- The coalition government's schools white paper and national curriculum review which includes a renewed subject focus.

NATE is also experiencing declining membership, 25% in just one year (McNeilly, 2011). The access to free resources on the Internet is cited as one possible reason for declining membership, despite the variable quality of such materials.

In the information age where teachers can access a wide range of free resources and network with teachers virtually, for example those they met in initial teacher education, are subject associations relevant to the modern teacher? Subject associations are a Victorian institution – how do they reconstruct themselves for the 21st century? What is the unique selling point (USP) for subject associations?

I suggest some possible reasons for the continuation of subject associations are:

- Providing a professional home which transcends teachers' immediate work context and enables them to explore with others the nature of the subjects they teach and how best to enable learning.
- Facilitating local, regional and national events that enable shared learning.
- Informing members and the wider community of developments in the subject.
- Collating the views of practitioners and experts to influence policymakers.

Given the declining and ageing membership, the ever present challenge to maintain financial viability, the increasing availability of free resources, electronic forums and social networking sites it is time to reopen a debate about the future of mathematics subject associations in the UK: it would be irresponsible not to. We need to consider our purpose – what are we trying to achieve? And then to work together to realize that vision.

In the UK, ASE and ALL provide models for how a larger organization can embrace diversity and be stronger by working together. They are better able to influence policy decisions that affect their subjects, and provide a one-stop shop for professionals. These organizations have within them structures that facilitate specialist subgroups or committees, such as advisers, ITE tutors and primary practitioners. Since 1920 The

National Council of Teachers of Mathematics (NCTM) has provided a strong and united voice for mathematics education in USA. In Australia, Poland, Denmark, New Zealand a single subject association for mathematics influences the development of mathematics education in their countries in an enviable way.

I end by quoting Mike Price some 16 years ago:

“The need for a united voice in English mathematics education, like the NCTM’s or ASE’s, is still pressing but seems a long way off. ... From the MA’s perspective, I ask for recognition of the ATM’s culture, which has been shaped by its history over the past forty years. From the ATM’s perspective, I would like to see a greater awareness of the extent to which the MA has changed over the past twenty-five years through pursuing its mission to become a ‘comprehensive association for mathematics education in England’.”

(Price, 1995, p.11)

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## Notes

1. National Association for Numeracy and Mathematics in Colleges, established in 1993.
2. Association of Mathematics Education Teachers, formed in 1990 as a merger between two separate associations concerned with initial teacher education (ITE) in mathematics.

**Keywords:** Mathematical Association; ATM;  
Subject associations.

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Sue Pope is a member of the General Council of ATM, and writes here in a personal capacity. The article is also being published in ATM’s journal *Mathematics Teaching*, **226**, January 2012.

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