Some of us (Derek Ball counted 40) spent a weekend over the early May bank holiday this year working on visualisation in mathematics. We met in the Lake District, on the shores of Derwentwater, at a wonderful, but basic, residential centre, Hawse End. The staff looked after us splendidly and tolerated the behaviour of an ATM group at play. We were at play, but we were also at work.

So what was the work? To find this out you will need to dip into the writing in this issue and MT206 (January 2008). We worked with old animated film, some from the deep past of ATAM (Association of Teaching Aids in Mathematics), new DVDs and, most importantly, we made pictures and operated with them in our heads.

There were two separate notions that went into the planning pot for the weekend.

Firstly, a remembered remark by Dick Tahta. He said something along the lines: “A point moving round a circle is a canonical image that everyone has a right to have worked on”. He went on, on that occasion, to ask: “are there other canonical images?”

Secondly, a letter from Archimedes to Eratosthenes about ways of working at geometry. Part of his letter is reproduced above. He raised things that seem to us to be important if we are to rescue geometry teaching from its current state. Is he actually saying that what is known in mathematics is first discovered in the mind?

Dave Hewitt rises to Dick’s challenge about canonical images (p6). John Hancock then places one of these in the context of his classroom (p39). There is, of course, still more work to do on canonical images, as is indicated by Derek and Barbara Ball (p4) and Dave Hewitt.

The Archimedes quote was used as an introduction to a pamphlet written by J. L. Nicolet, an astonishing maths teacher, living and teaching in Switzerland over the 1939-45 war years. Page 42 of this issue reproduces some writing by Caleb Gattegno about Nicolet’s work (see box on page 3). This is included by way of historical background and as a reminder of the long history of ATAM involvement in moving images, film and filmmaking. On page 44, at the start of his article, John Mason pays tribute to Dick Tahta for the work he did in working with animation and developing techniques for doing this effectively with learners. Dick was also the driving force behind the ATM book Geometric Images, now, sadly out of print.

Trevor Fletcher, whom many of us remember as the Staff Inspector for Mathematics at the time of the Cockcroft Committee, made animated mathe-
Mathematics has always been a difficult subject, both for the teacher and the taught. Methods based upon the concrete representation of numbers often, it is true, make it less forbidding; nevertheless mathematical understanding does not come naturally to most minds.

A Lausanne teacher, M. J.-L. Nicolet, believing that the study of mathematics should be an opportunity for the pupil to experience certainty, and therefore a deep satisfaction of the intelligence, that it should also be an education of the æsthetical sense and, above all, a powerful means of cultivating the mind, has invented an ingenious system which appears to him to ensure these results and at the same time to apply the most recent findings of child psychology: he uses the cartoon film, thus enlisting for the teaching of mathematics one of the most modern of techniques, the cinematograph.

The cartoon offers far more possibilities than the diagrams which have hitherto been used for the demonstration of geometrical theorems. According to M. Nicolet, a cartoon film must not be a paraphrase of a mathematical demonstration. It must awaken, subconsciously, the æsthetical sense and guide it towards the acquisition of a certainty leading to the desire for demonstration.

Thanks to the films created by M. Nicolet, the pupil goes through the three stages of mathematical understanding in their natural order: the initiative stage during which he anticipates a truth and adopts it because of its suitability; the inductive stage which enables him to verify several times the truth he had adopted and to become convinced of its certainty, at the same time awakening his desire for demonstration; the deductive stage, that is to say the actual reasoning, then comes at the right moment, like a fruit slowly formed and ripened.


1 See M. Nicolet’s pamphlet entitled, ‘Intuition mathematique et dessins animes’, published by Payot, Lausanne.
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