Introduction
Dr Peter Neumann, son of the late Professor Hanna Neumann, will be the keynote speaker at AAMT’s biennial conference ‘Capital Maths’, which will be held in Canberra from 11–13 July 2017. Prof. Hanna Neumann gave the Presidential Address at AAMT’s inaugural conference in 1966. The conference was held at Monash University and had the theme of ‘mathematical unity’. Below is a transcript of Professor Hanna Neumann’s address.

Prof. Hanna Neumann’s address

When I asked our president what he wanted me to speak about on this occasion he told me firmly that this was now up to me. I therefore feel free to depart from the admirable example set by our voices of authority—quite at my own risk of course—and I choose as my topic something about which I know nothing professionally. I only know it as an observer, and a consumer, as a parent, but I shall now speak about the teaching of mathematics in schools.

I shall describe some features of the teaching of mathematics in a country in which—to be quite fair—I shall not call Utopia. While, to be honest, I know of no country in the world where the features I describe are all present, I do not describe anything that is not in operation in some country, on some continent, and that I have observed myself from close quarters. I was not going to call this country Utopia. I need a short and convenient name for it, I shall call it Semut.

To prepare the ground I shall start with a few remarks on the organization of schools and teaching in Semut. I am thinking mainly in public schools, not in the sense in which the English use this word, but schools under the control of the education authority, whatever that may be, rather than private schools.

The teachers of primary schools are trained, in this country, in teachers’ training colleges, teachers of secondary schools are university graduates and they teach the subject or subjects in which they have graduated. They are recruited to the schools by advertisements to the schools, not to the education authority, although the later pays the bills. So teachers, when looking for a post, will apply to one or more schools that have advertised a vacancy in their subject, and, depending on their qualifications, they may well have a choice of jobs to which to go, from which to choose one. But also, on the other side of the picture, the head of the school himself, as chairman of a small selection committee, selects the appointee, that is, the head of the school chooses his staff.

The subject masters, subject to the approval of the head, are responsible for the curriculum, they are responsible for what they teach and how they teach it. There are informal tests, on and off, as, and then, teachers think it necessary and healthy; they vary in nature—may be oral, written or practical. Apart from these, which take little time, the school year is devoted to work and other fruitful activities.
The country of which I speak has several examining bodies, and the school is free to choose for which of these examinations to enter its pupils. I know very well a school that, for some good reasons, mainly availability of subject, chose one examination board for the examinations at what I will roughly call equivalent to intermediate level, but another examination board for the leaving level. The requirements, but other reasons play a part, and the standards required by these boards are, in fact, fairly uniform as far as basic common core of a subject is concerned.

Of course, in this country, as elsewhere, the reorganization and revolution in the teaching of mathematics is increasing. The way it works is as follows: some experienced teachers in a school or a group of schools in various parts of the country try out new teaching methods, with one or two age groups at a time. With the cooperation of university mathematics they write their own teaching materials, they correct, they rewrite in the light of classroom experience while widening the scope of the pilot scheme, until out of this rigorous testing by teaching there emerge materials fit to be printed. It is then that more and more schools will join the scheme, whose growth is then controlled mainly by the availability of teachers able and willing and confident enough to use the new methods with the help of the new material.

Finally, an examination board will be approached to provide alternative papers better suited to the new methods and terminology and spirit.

Except for the final step, the procedure at primary level is similar, although one difficulty seems to be more prominent than at secondary level, a feature that I am sure must be familiar to many of you—parent resistance. This can prejudice the children’s attitude to mathematics profoundly, and impede their progress. And something has to be done to teach the parents. Some quite admirable books on mathematics for parents are available, but not many parents seem to make use of them. So they are invited to come to the school and join the children’s lessons, freely, without previous notice. The obvious sincerity of the invitation in the first place serves to create confidence. It is also quite safe—not too many parents come. Some do, and it turns out contrary to my expectations, that a few parents in the back of a classroom so not upset a class. I have watched myself. For those parents not able to come in school hours, classes are provided in the evenings, one hour twice a week. They are given by the same teachers that teach their children. These classes are surprisingly well attended, for as much as several months, and they achieve their object remarkably well. Parents at the very least will try to cooperate, at best they become enthusiastic, but in any case they feel no longer that they look foolish when their children come with questions on homework. I must add here that the teachers did this simply as part of their endeavour to teach the children, and perhaps at this point I should remind you, as again later, I promise and keep to my promise to describe only features and ways of doing things that I have actually observed.

As already mentioned, this introduction of the new methods is limited by the lack of trained or retrained teachers, as everywhere. Apart from the usual advisory service provided by mathematical educators in universities, provision has been made for more training, and training courses are, for convenience, based on universities. It is there that you will find the staff mainly that will help with the training, you find the books and you find the accommodation. Teachers enroll for an intensive residential course in their long vacation. If they have families they may take them along. Accommodation is provided, fares and expenses are paid. Again I remind you of my earlier promise.

There also are those who are released from teaching for a whole year to take courses especially devised for the purpose at the university, and again, expenses are paid.

Again, as everywhere else, you find in every school, on and off, to our good fortune, those very bright pupils who are a delight to every teacher and at the same time perhaps who stretch the resources of some schools to more than their limit. There will always be some
schools simply not fitted to provide for the high fliers the stimulus they need both from their teachers and from their parents. For these children scholarships are provided to enable them to attend special schools, located near a university, and in these schools the children are taught the same subjects, the same variety of subjects as everywhere else, the go-ahead are allowed to go ahead, and are encouraged to go ahead at their own natural pace. Once or twice a week their mathematics lessons are taken by senior university staff. This is the reason for locating such schools near universities. And naturally when these children enter the university and still want to do mathematics—not all of them do, no pressure is applied in that direction—they will naturally enter the university at the second year level at least. For bright youngsters not able or not willing to go to such mathematical schools because of their special locations—there are other provisions that many of you will be familiar with—mathematics camps. Vacation camps are under the guidance of enthusiastic teachers, they live and work and play together, and again senior mathematicians from universities and industries will visit such camps and contribute to the excitement of the mathematical experience and atmosphere. Besides, there are, of course, enrichment classes, competitions, run by university staff, to give lively senior pupils a taste of mathematics off the beaten track and outside the scope of school mathematics.

You will notice that I have not really gone into details of mathematics teaching. I know nothing about it. I feel not competent to do more than report on the framework, as it were, in which mathematics teaching may be set. So these features that I described are of course varied. Some require, for their realization, nothing more than enthusiasm and goodwill. Others require at least a great deal of steady, patient lobbying and planning, and a great deal of patient hard work. Naturally the impressions that have stayed with me, that is those that I have described, will reflect my personal bias, and opinions on detail will clearly differ. Even so, I believe that the Australian Association of Mathematics Teachers could do worse than measure its success by the impact it makes on the task of establishing something like this country that I have described, in Australia.

Thank you very much.