INTERNATIONAL CONGRESS OF MATHEMATICIANS 1978

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The International Congress of Mathematicians (ICM) 1978 was held in Helsinki, Finland, from August 15 to August 23. More than 3000 mathematicians from 74 countries participated in this Congress – an event considered to be the single most important international meeting. There were two participants from Singapore : Dr. K. M. Koh from Nanyang University and myself.

The ICM's have a long history that dates back to 1897, when the first Congress took place in Zurich, Switzerland. In 1900, the second Congress was held in Paris. Since then the ICM's have been held once every four years except during the two world wars when international mathematical activities all but stopped.

Today preparations for ICM's take at least two years and involve collaborations with a large number of mathematicians from all over the world. Each ICM attempts to present the present state of progress of mathematics through invited lectures given by mathematicians who in many cases have done distinguished work in the mathematical areas surveyed. Indeed it has always been considered a great honour to be invited to an ICM to deliver a lecture.

The Executive Committee of the International Mathematical Union appoints the Consultative Committee which is responsible for the selection of invited speakers. The Consultative Committee first divides mathematics into a number of sections (e.g. mathematical logic, number theory, topology, geometry, probability, etc,) and then elects a chairman and a panel for each section. Nominations of speakers are then requested from eminent mathematicians. This year 137 mathematicians were invited to deliver lectures at the ICM. Of these, 43% were from the United States, 22% were from the Soviet Union, and the rest from other countries (France, Germany, Great Britain, Japan, etc.). Of the invited speakers, a significant number of them are young mathematicians who have recently done truly outstanding work. One of them, Professor Shiing-Tung Yau (of Hong Kong, but now teaching at Stanford University, U.S.A.) is only 29 years old. Yau was extended the honour of delivering a main one-hour lecture on differential geometry.

Often noted as 'the Nobel Prize in Mathematics', the Fields Medal is awarded at the opening session of each ICM (see *'1978 International Congress of Mathematicians'*, this Medley, vol.6, no.1, 1978, pp. 38 - 49, for a brief history of the Fields Medal). In two important respects, however, the Fields Medal differs from the Nobel Prize. Firstly there is the established tradition that awards be given only to young mathematicians below the age of forty, "in recognition of work already done and an encouragement for further achievements." Secondly, the award is given only once every four years. While only two awards were made at the ICM 1974, four young mathematicians received the Fields Medal in Helsinki this year. They were
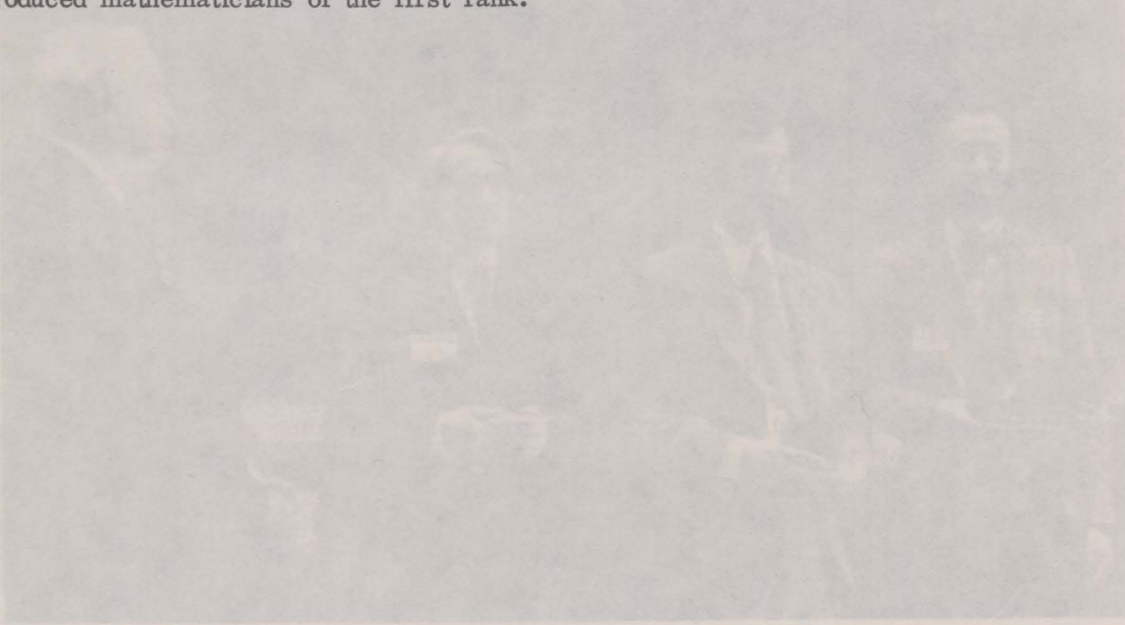
      P. Deligne (Institut des Hautes Etudes Scientifiques, France)
      C. Fefferman (Princeton University, U.S.A.)
      G. A. Margulis (Academy of Sciences, USSR)
      D. Quillen (Massachusetts Institute of Technology, U.S.A.)

The awards were given in recognition of their contributions to the fields of (respectively) algebraic geometry, classical analysis, number theory, and algebraic K-theory.

Presentation of the Fields Medal : (from left to right) P. Deligne, C. Fefferman, D. Quillen and R. Nevanlinna.

It is clear that the trend of mathematics today is one of fusion, along which several fields interact closely with each other, borrowing from and stimulating further progress of various mathematical disciplines. Jean Dieudonné, the famous French mathematician, had once remarked that in mathematics there is no such division as algebra, analysis, topology, etc. "There is only one subject - mathematics, period !" Any division of this kind, in his opinion, is both arbitrary and artificial. Indeed even in the case of mathematical physics one finds the recurring use of techniques in differential geometry and manifold theory. In the case of pure mathematics, one could discern from the lectures delivered at Helsinki, and from the recent article by Dieudonné (*'Present trend in pure mathematics'*, Advances in Mathematics, Vol. 27 (1978), 235 - 255) that there exist a handful (thirteen - according to Dieudonné) of subjects which together form the 'core' of pure mathematics. While some might say that no specific trend appeared visible forty years ago, one has to accept the fact that the picture is completely different today. Thus there are probably more leading mathematicians working in number theory, algebraic and differential geometry, algebraic and differential topology and analysis than in other fields. After nearly thirty years of mathematical development in Singapore, through the research work done by mathematicians in the two universities in various mathematical areas, it seems that we have proved our competence and should perhaps encourage mathematically gifted youngsters to study and perhaps work on areas considered to be 'the core of the core' of mathematics, namely number theory, algebraic and differential geometry, etc. Admittedly the beginning will always be the most difficult, but I believe that this is not an impossible task. The Singapore Mathematical Society's Inter-school Mathematical Competition, held annually, has shown that there is no lack of mathematical talent here. Indeed, one needs only consider the case of Hong Kong, whose population is only twice that of Singapore, but which has produced mathematicians of the first rank.

Presentation of the Fields Medal : (from left to right) P. Deligne, C. Fefferman, D. Quillen and R. Neranlinna.