

JOINT SESSIONS OF THE MAA AND NCTM, by J.M. Cherniwchan

Editors' Note: John Cherniwchan, a teacher at Salisbury High School and a former president of the MCATA, attended a joint meeting of the Mathematical Association of America and the National Council of Teachers of Mathematics in January, 1965 as a representative of the MCATA.

The day was devoted mainly to the presentation and examination of views as to what should make up the mathematics curriculum at the twelfth grade level. Individuals presenting these views were in the main university personnel; I surmise that the stand taken by these people was determined to a large extent by what they, as college teachers, would like to see included in the twelfth grade curriculum. I missed hearing any discussion of program or programs in mathematics for a student not college bound.

The first session concerned itself with the twelfth grade program from the college viewpoint with emphasis on competence, content and continuity. Today there is a considerable divergence in preparation for college, as well as a considerable range in the ability of students that enter college. Frequently there is somewhat of a gap between high school mathematics and college freshman mathematics. (In view of the current changes occurring in the high school mathematics program in Alberta, what follows will be of some interest. Some of the colleges in the United States are now receiving students who have gone through the new mathematics curriculum. Several comments pointed out that these students showed generally a lack of competence in algebraic manipulation.)

There appeared to be two schools of thought with respect to the inclusion of calculus in the Grade XII program.

Professor A. Black of New York University reported that some 10,000 high school students were presently receiving instruction in calculus. He felt calculus was a natural outgrowth of algebra and should be taught relatively soon after algebra. Teachers are probably better prepared to teach calculus than linear algebra or probability. Teacher readiness is a matter of mental attitude and

intellectual honesty. Some texts in calculus for high schools are such that a teacher willing to work, will be able to teach the subject. An example of this is the SMSG text. Professor A.P. Mattuck from MIT felt that the emphasis on rigour is being carried too far. If calculus is to be applied, it is the techniques that are important. He pointed out that despite the "pure" approach prevalent today, the examinations the students write tend almost invariably to be applications of standard calculus formulas.

Several people took up the argument for the other side. There seemed to be general agreement that a better foundation for calculus could be laid at Grade XII level. Courses in Elementary Functions, Analytic Geometry and Inequalities are desirable. The Limit Concept, the Delta-Epsilon theorems are somewhat too sophisticated for the level of maturity that high school students have. Professor D. Richmond from Williams College delivered a very interesting paper on pre-calculus mathematics. He demonstrated in his paper how by using two Inequalities it is possible to solve a good number of calculus problems. His contention was that this sort of thing could be done at high school level, and calculus taught in a traditional way in college. However, there were people that took objection to his approach. His retort was: "with too much purity, there cannot be much fertility".

Another session was devoted to the question of Probability and Statistics for the twelfth year student. It is desirable to continue the inclusion of units on data processing in secondary school mathematics courses. The notion of sets is here to stay; however, Probability should not be taught through set theory, and should be taught before statistics. A course in Probability and Statistics should be an elective for superior students.

A representative from Rand Corporation talked about the role of computers in secondary schools. A good number of reasons were quoted for the inclusion of computer courses, but many of these, as he himself admitted, were pretty weak. Judging from the reaction of my immediate neighbors in the auditorium, not too many took him seriously.

What were my general impressions? The controversy between those that argue that Calculus be included in, and those that want it excluded from the secondary school curriculum will not die soon. It should be remembered that individual school systems in the United States have a great deal of autonomy in curriculum design. I suspect there will be schools teaching Calculus for some time. However, the general trend, I believe, will be to give a better base for calculus. Elementary Functions, Analytic Geometry and Probability and Statistics will be included in the twelfth year program as electives, and probably as semester courses.

I arrived for the joint sessions the evening before in time to preview some films that are being readied for distribution. One of them I would like to recommend very highly: "What is Teaching? A Demonstration by George Polya". There is much in this film for every mathematics teacher.

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The theme of the 1965 MCATA Annual is to be ELEMENTARY MATHEMATICS. Members are invited to submit articles dealing with the general topic or any specific sub-topic. In this way, understandings and teaching techniques can be shared. As many articles as possible will be printed in the Annual or in the subsequent Newsletter.

Submissions must be mailed to Professor Wm. F. Coulson, Faculty of Education, University of Alberta, Edmonton, by June 30, 1965.