Mathematical Preparation of Alberta Math Teachers

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It may seem obvious that a teacher must know the subject matter which he or she is teaching, particularly in a subject such as "modern" mathematics. The Mathematical Association of America considered the problem of the background in college mathematics which would be needed by teachers of mathematics. To do this, the Committee on the Undergraduate Program in Mathematics (CUPM) was formed; it recommended the following courses in university mathematics:

    4 semester courses for elementary school teachers
    7 semester courses for teachers of beginning Algebra (Grades VII and VIII)
    11 semester courses for teachers in Grades IX through XII mathematics.

They stated that these recommendations were minimal, and a comparison with re-commendations of other committees and groups would show much higher standards being proposed.

Since the CUPM organization is a well-recognized mathematical body, it seemed interesting to compare Alberta's teachers of mathematics to this standard. The study became part of an M.Ed. thesis at the University of Calgary. In May of 1968, questionnaires were mailed to a random selection of 209 schools in Alberta. Teachers of any mathematics were asked to complete the questionnaire which dealt with their mathematical training and other selected topics. Results were tabulated from the 910 questionnaires returned.

Only 10 percent of Alberta elementary school mathematics teachers and 20 percent of Alberta junior and senior high mathematics teachers had sufficient mathematics background to satisfy the CUPM recommendations. Sixty-seven percent of Alberta elementary mathematics teachers reported *no* training in university mathematics. The CUPM felt that the elementary teacher in the self-contained classroom who must teach every subject should have taken four semester courses in mathematics plus whatever was required in the other subject areas. They ex-pressed doubt as to whether or not this could be accomplished in only four years of a teacher preparation program. However, about 60 percent of Alberta teachers have less than four years of training.[1]

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[1]J.E. Wicks and T.F. Rieger, *The Alberta Teaching Force, September, 1966.* Research Monograph No. 12 (Edmonton, Alberta: The Alberta Teachers' Association, 1967) p.13.

At the junior high school level, 23 percent of the responding mathematics teachers reported no university mathematics courses. Fourteen percent of the senior high school mathematics teachers responded in a similar way. Only 62 percent of the junior high mathematics teachers and 51 percent of the senior high mathematics teachers stated that mathematics was their main field of interest. Since subject matter specialization is practised in these grades in many schools, it is assumed that anyone teaching mathematics would prefer the subject and would have some background beyond his own high school training. Has this large proportion of Alberta mathematics teachers been "mis"-assigned in their teaching positions? Is it not considered important that the teacher instructs in the subject for which he has been prepared? Or is it simply that there are not enough qualified mathematics teachers?

Ten percent of elementary teachers and 33 percent of secondary mathematics teachers expressed a desire to take further mathematics courses. It was found that the intention to take further mathematics courses was greater for the teachers who had previously taken one or more university mathematics courses than for those who had not. This may be an obvious observation, as most of those who have taken mathematics courses have taken them because they were interested in the subject and consequently would be interested in taking more courses. At the secondary school level, teachers' desire to take further mathematics courses was greater for younger teachers than for older teachers. This may be because the older teachers have completed their training to their satisfaction and, therefore, are not interested in taking further courses in any area.

If it is important that the modern teacher have a broad background in the subject he teaches, something must be done to persuade every mathematics teacher to further his own training to the point where he at least reaches a standard as set by the CUPM, which regards its own standards as minimal.

Inservice projects in mathematics may be an answer to the problem of insufficient background in mathematics, but it was found that approximately one-third of the respondents had not participated in such projects. Many inservice projects are of such short duration that they are relatively ineffective, but 26 percent and 37 percent of the elementary, junior high, and senior high mathematics teachers, respectively, reported over 15 hours of inservice activities in modern mathematics. However, the problem of reaching the teacher of mathematics who is not primarily interested in mathematics exists, as approximately 65 percent of the respondents who had no university background in mathematics had taken part in less than 15 hours of inservice modern mathematics activities, and thus the effect of these activities would be minimal.

Formal courses or inservice activities may not be the only answer. The teacher's initiative in self-study may give a good knowledge of the subject not measurable in the number of formal courses taken. The studying of topics in mathematics which appear in grades higher than the one taught by the teacher is a good project. Films on modern mathematics topics are available from our Mathematics Council, and could be valuable.

The training in mathematics of Alberta mathematics teachers may be lower than what is considered advisable in terms of formal courses; however, rather than bemoan the situation, we must be constructive. Have we as members of the

Mathematics Council prepared ourselves at least to the level advocated by the CUPM? What can we do in promoting more interest and enthusiasm in activities which foster further mathematical knowledge in our own school and area? How can we draw people who are not primarily interested in mathematics into these activities? The answers to these questions are not clear, but they must come from our clear thinking on the issue. Each and every one of us will have to work on finding a solution to existing problems in this important matter.

ONTARIO MATHEMATICS CONTEST
(formerly Ontario Junior Mathematics Contest)
April 8, 1970

A.S.B. Holland

Once again the Ontario Mathematics Contest, a national contest designed by the Mathematics Department of the University of Waterloo, is made available to junior and senior high schools with students principally in Grades IX, X and XI. The main aim of the contest is to stimulate students who are interested in mathematics and to provide an opportunity for schools and students to test their mathematical prowess against others.

This year's contest will be the third in which Alberta schools compete. The contest is sponsored by the Department of Mathematics at The University of Calgary. Registration forms have been sent out to nearly all schools in Alberta that teach students in Grades IX, X and XI. Included with the registration forms were order forms which should be returned to the University of Waterloo for those schools wishing to order copies of previous contests. The basic fee for the contest is $5; this amount entitles any school to enroll students in the age bracket up to and including 20. For every student in excess of age 20 a further charge of 25¢ is made. A maximum number of 99 students from any one school is permitted.

The contest will be held from 9 to 10 a.m. on Wednesday, April 8, 1970 (not Wednesday, April 1, 1970, as we previously advertised). It will consist of 32 questions in three categories. Category A is fairly simple and valued at three points each. Questions in Category B are more challenging and valued at four points each. Those in Category C are quite stimulating and valued at five points each. The contest is multi-choice with five answers supplied for each question. The contestant is required to indicate which one, in his opinion, is correct. Points are deducted for incorrect or multiple answers. The contest is on an individual and school basis. The school team score consists of the sum of the three highest scores obtained by individual contestants. Each school receives a listing of the scores of all students in their own school, one of the top students in their district, one of the top students in their province and one of the top students in Canada; as well as listing of all schools in their