THE ALBERTA TEACHERS' ASSOCIATION

MATHEMATICS COUNCIL

NEWSLETTER

Volume X, Number I, December, 1970

The Current Status of High School Calculus

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An article by Daly[1] outlines the development of mathematics curricula in Alberta. He reports that in 1934, calculus was included as a part of the Grade XII course in analytical geometry. In 1951, he continues, "Calculus and analytic geometry were discontinued, but trigonometry was included as a separate three-credit course."[2]

During the 17-year period following 1951, therefore, it was not possible for Alberta students to take a course in calculus at the Grade XII level. Two choices were available to them. They could take Mathematics 30 only, which was essentially an academic five-credit course in algebra, plane geometry and combinatorics, or they could take Mathematics 30 and Mathematics 31. The latter course was a course in trigonometry, carrying three credits. Most students who wanted to be admitted to a sciences program at a university in Alberta would elect both Mathematics 30 and Mathematics 31, as the former was a compulsory requirement, and the latter was "strongly recommended" by the universities.[3]

Although changes in textbook authorizations between 1951 and 1968 wrought a modernization of the approach to teaching Mathematics 30 and 31, the essential content of the courses remained substantially unchanged.

in this issue

During 1967 and 1968, reports circulated which indicated that the present high school mathematics courses had been examined, evaluated and were to be revised. By February, 1968, the Senior High School Curriculum Committee of the Alberta Department of Education had accepted *in principle* the recommendation that separate sequences of high school mathematics courses be adopted for students who were university-bound, non-university-bound, and business-oriented.[4] For the approximately 35 percent of Alberta high school students who intended to go to university, the sequence consisted of Mathematics 10 (Grade X), Mathematics 20 (Grade XI), and Mathematics 30 and 31 (Grade XII).

The Curriculum Guide for Mathematics 31, which became prescriptive in September, 1968, outlined the revised Mathematics 31 course:

> Mathematics 31 is made up of two parts: (i) Trigonometry, and (ii) Calculus OR Vector AND Matrices *(sic)*[5]

Each of the two parts was to consist of 80 periods (the periods 40 minutes in length). The choice as to which alternative to offer during the second half was left to the teacher or to the school, although some guidelines were given to assist in making the choice.[6] For the calculus alternative, the text *Calculus* by H. A. Elliott and others[7] was prescribed.

So far as the writer has been able to ascertain, only one Math 31 class in Calgary public schools was taking the non-calculus alternative during the 1968-69 school year.

One assumes that the recent inclusion of calculus as a Grade XII level course in Alberta has been precipitated by similar action in the United States. The increase in offerings of high school calculus in that country dates back to 1959 when the recommendations of the Commission on Mathematics of the College Entrance Examination Board were published. The Commission held that calculus is a college-level subject, and high schools should prepare students to begin calculus when they enter college; nevertheless, it recommended that well-staffed high schools offer their ablest students a year of college-level calculus and analytic geometry.[8] Short courses in calculus at the end of Grade XII were not recommended.[9] Woodby[10] concurred with this recommendation in 1965.

During the next few years, calculus was offered in more and more American high schools. Many of the students who completed it successfully were able to receive college credit through the Advanced Placement Program.

The Cambridge Conference on School Mathematics published its report in 1963.[11] Two topical outlines were suggested for Grades VII-XII Mathematics. One included a logically complete course in calculus in Grades XI and XII, after the limit concept is understood. The second introduced calculus briefly in Grade IX and then returned to a complete and rigorous study in Grades XI and XII. Justification for both approaches was given.[12]

There has been general agreement that calculus *can* be learned by Grade XII students.[13] Many authorities quote Bruner:[14]

> ... any subject can be taught to anybody at any age in some form that is honest.

Moise[15] puts it this way:

> ... a student who can ever learn calculus can learn it in the 12th grade.

But the controversy over whether or not calculus *should* be taught to Grade XII students has continued.

Ferguson[16] believes that many more schools should offer calculus than do now, but that certain prior conditions must first of all be met. The school must have a curriculum in which elementary and intermediate algebra, plan and solid geometry, trigonometry, and coordinate geometry are completed by the end of Grade XII. A college-level teacher must be available, students must be willing to spend eight to 10 hours per week on calculus homework, and must be adequately motivated. Ferguson cites figures from his own school to show that its program has been most successful.

Others would agree with Ferguson's assessment. Moise[17] writes as follows:

> Many schools teach calculus in the 12th grade; and the experience of the last few years shows that this is quite workable if qualified teachers are available. But the *if* is important.

Blank[18] advocates a full year of essentially intuitive calculus in Grade XII, giving the student insight into certain proofs without detailing them. Some of his reasons for favoring calculus are worth restating here:

1. Calculus is close to the spirit of secondary school mathematics in its manipulative and problem-solving aspects.
2. The concepts, methods and skills developed earlier in the high school mathematics program have applications to calculus.
3. Calculus provides the broadest possible base for students' later development.
4. Calculus plays a profound role in the intellectual and practical affairs of men.
5. Teachers feel more qualified in calculus than elsewhere, as present teacher education makes their having taken calculus more likely than any of the alternatives.

While the above endorsements of a Grade XII calculus course are not made without some reservations, the reader should be aware that there is another side to the coin.

Beninati[19] favors a Grade XII course in probability and statistical inference or analytical geometry over calculus. He contends that a calculus program offered by inadequately prepared teachers may lead to subsequent failure in college calculus courses, due to the student's inadequate preparation and his meaningless manipulation of symbols.

Allendoerfer[20] maintains that both the secondary schools and the colleges are heading for serious trouble in their teaching of calculus. While calculus is an essential part of a mathematical education, its importance in and relation to algebra, geometry and other subjects has been over-emphasized. Calculus is being taught too early to students who should be studying other mathematical topics such as theory of polynomials, rational functions, algebraic functions, trigonometric functions, inverse trigonometric functions, exponential functions, logarithmic functions, and a full treatment of analytic geometry.

The only conditions under which Allendoerfer would endorse a Grade XII calculus course are stringent:

1. The topics (listed above) must have been covered *prior* to Grade XII.
2. The teacher must be superior.
3. The course must emphasize an intuitive treatment of the limit concept and infinite series prior to calculus as such.
4. Integration, approached through sums of infinite series, must be taught before differentiation.

Brown[21] reported the results of a survey of 49 mathematics department heads at colleges and universities in Ohio. Thirty-two questionnaires were returned. To the question "For students who have already taken two years algebra, one year plane and solid geometry and a semester of trigonometry, what should be the emphasis for the remaining semester?", only one respondent (three percent) favored calculus. The topics favored over calculus were Analytic Geometry (53 percent), Probability and Statistics (16 percent), Function Concepts, Mathematical Structure and Analytic Geometry (nine percent), and Analytical Trigonometry and College Algebra (six percent).

When asked whether calculus should be included in the college-preparatory program, 69 percent responded "no", 25 percent answered "yes" (but in most cases there were conditions attached), and six percent were uncertain. Similar percentages were reported for answers to the question: "Should a short introduction to calculus be given during the senior year of high school?".

Buchanan[22] reported a wider survey. Two hundred thirty-three questionnaires were distributed to college and university mathematics department heads throughout the United States. They were asked to rank seven topics for Grade XII in order of their preference, responding to the questions in accordance with the consensus of opinion of their staff members. Seventy-three percent of the questionnaires were returned. Calculus ranked sixth in order of preference, with only 18 percent choosing it first or second. A unit on limits was ranked above calculus on every questionnaire for which calculus was not ranked first.

A number of researchers have studied the effects of various high school courses on performance in college calculus courses.

Chaney[23] found that University of Kansas students who had studied limits of sequences, limits of functions and continuity in Grade XII performed significantly better in first-year university calculus than students who had only studied analytical geometry.

Tillotson[24] studied 192 students in first-year calculus and analytic geometry at the University of Kansas. He found no significant difference in achievement between students who had taken an introductory course in calculus in Grade XII and those who had not.

McKillip[25] used the multiple regression technique to predict students' scores in the first year of college calculus at the University of Virginia. Scores predicted were derived on the presupposition that students had had no calculus in high school. Actual scores were subsequently compared with the predicted scores. Scores of students who had one to two semesters of calculus were not significantly different from predicted scores, whereas students who had taken two or more semesters of calculus in Grade XII attained scores that were significantly better than those predicted. McKillip's conclusion is that a Grade XII calculus course of less than two semesters must be justified on other grounds.

Maclay[26] concluded that non-accelerated students should not be placed in a high school calculus course, even when their pre-training has been in a new mathematics program. Specifically, the SMSG High School Mathematics Program did not provide adequate background for Advanced Placement in calculus.

Wick[27] found no significant differences in preparation for first-year college calculus as between SMSG and traditional high school programs. He noted a low but positive correlation between Grade XII mathematics average and success in first-year calculus. The conclusions were based on a study of 1962 students in six colleges and universities in Minnesota and Wisconsin.

Coon[28] found that 60 SMSG students were superior to 122 conventional students in university calculus. The difference was significant at the .05 level for success and at the .01 level for achievement in a first-year course. However, he urges caution in interpreting the results of his study attributing the differences to "continued mathematical maturity based on different high-school preparation, not (necessarily) to learning in calculus."

Anderson and Whittemore[29] found that students whose high school mathematics courses were 'modern' scored significantly better than students with a 'traditional' background, on a pre-university mathematics test (American College Testing Program: Mathematics [ACT]). The correlation between high school grade in modern mathematics and grade point averages in university algebra and trigonometry and university calculus was found to be significant, while that between traditional high school mathematics score and the above GPA's was not found to be significant.

Prouse and Turner[30] used the technique of multiple regression analysis to determine what combinations of 15 independent high school and university variables contributed to success in second-year university calculus. The high school variables which contributed most highly to success in Calculus 2 were Plane Geometry, Trigonometry, Algebra 2, rank in graduating class, Algebra 1 and ACT Mathematics standard score.

Woodby's conclusions and recommendations[31] provide the best possible summary of the opinions and findings reviewed above.

CONCLUSIONS

1. The individual teacher is the most important factor in the development of a strong mathematics program.

2. There is a lack of agreement on the mathematics that should be taught in Grade XII courses for college-bound students.

3. Acceleration and enrichment have generally accompanied the development of a strong mathematics program.

4. Concern for calculus prevails.

5. There is little acceptance of a course in probability and statistics as the fourth- or fifth-year mathematics offering in the college preparatory program. There is even less acceptance of courses in linear algebra, matrices and computer mathematics.

6. Analytic Geometry as a separate course has achieved only slight popularity.

7. It has been demonstrated that college-level calculus courses can be successfully taught at the high school level provided the following conditions are met: (a) that there are enough capable students; (b) that the teacher is adequately prepared.

RECOMMENDATIONS

1. Experimentation with various Grade XII courses in mathematics should continue.

2. Colleges and universities should provide guidance in the development of Grade XII programs.

3. Courses in calculus and analytic geometry of the warm-up variety are not recommended.

4. Grade XII courses in probability and statistics, linear algebra, or analytic geometry should be considered in preference to calculus for many high school students.

FOOTNOTES

[1] Daly, Richard R., "Alberta School Mathematics, 1867-1967", *Annual*. The Mathematics Council of The Alberta Teachers' Association, 1967, pp.4-14.

[2] *Ibid*, p.13.

[3] See, for example, The University of Calgary Calendar 1969-70, p.51.

[4] *MCATA Newsletter*, 7:2 (February 1968), p.9.

[5] Province of Alberta, Department of Education, *Curriculum Guide for Mathematics 31*. Edmonton: Department of Education, Province of Alberta, September 1968, p.2.

[6] *Ibid*, p.3.

[7] Elliott, H. A., Kenneth D. Fryer, James C. Gardner, and Norman J. Hill, *Calculus*. Toronto: Holt, Rinehart and Winston of Canada Ltd., 1966.

[8] Commission on Mathematics, *Program for College Preparatory Mathematics*. New York: College Entrance Examination Board, 1959, p.14.

[9]*Ibid*, p.15.

[10]Woodby, Lauren G., *Emerging Twelfth-Grade Mathematics Programs*. U.S. Department of Health, Education and Welfare, Office of Education, Washington, D.C., 1965, p.36.

[11]Cambridge Conference on School Mathematics, *Goals for School Mathematics*. Boston: Houghton Mifflin Co., 1963.

[12]*Ibid*, p.49.

[13]For example, see Woodby, *op. cit.*, p.35.

[14]Bruner, Jerome S., "On Learning Mathematics", *The Mathematics Teacher*, 53:8 (December 1960), p.610.

[15]Moise, Edwin, "The New Mathematics Programs", *The School Review*, 70 (Spring 1962), p.88.

[16]Ferguson, W. Eugene, "Calculus in the High School", *The Mathematics Teacher*, 53:6 (October 1960), pp.451-3.

[17]Moise, *op. cit.*, p.86.

[18]Blank, A.A. "Remarks on the Teaching of Calculus in the Secondary School", *The Mathematics Teacher*, 53:7 (November 1960), pp.537ff.

[19]Beninati, Albert, "It's Time to Take a Closer Look at High School Calculus", *The Mathematics Teacher*, 59:1 (January 1966), pp.29-30.

[20]Allendoerfer, Carl B., "The Case Against Calculus", *The Mathematics Teacher*, 56:7 (November 1963), pp.482ff.

[21]Brown, Robert S., "Survey of Ohio College Opinions with Reference to High School Mathematics Programs", *The Mathematics Teacher*, 56:4 (April 1963), pp.245ff.

[22]Buchanan, O. Lexton, Jr., "Opinions of College Teachers of Mathematics Regarding Content of the Twelfth Year Course in Mathematics", *The Mathematics Teacher*, 58:3 (March 1965), pp.223ff.

[23]Chaney, G.L., "The Effect of Formal Study of the Mathematical Concept of Limit in High School on Achievement in a First Course in University Calculus", *Dissertation Abstracts*, Vol. 28, p.2884A.

[24]Tillotson, Donald Bearse, "The Relationship of an Introductory Study in High School to Achievement in a University Calculus Course", *Dissertation Abstracts*, Vol. 24, p.577.

[25]McKillip, William D., "The Effects of High School Calculus on Students' First-Semester Grades at the University of Virginia", *The Mathematics Teacher*, 59:5 (May 1966), pp.470ff.

[26]Maclay, Charles W., Jr., "The Influence of Two Prerequisite Programs on Achievement in the High School Advanced Placement Calculus Course", *Dissertation Abstracts*, Vol. 29, pp.3917-8A.

[27]Wick, Marshall E., "A Study of the Factors Associated with Success in First-Year College Mathematics", *The Mathematics Teacher*, 58:7 (November 1965), pp.642ff.

[28]Coon, Lewis Hulbert, "S.M.S.G. Mathematics as a Factor Influencing Success in Freshman Calculus", *Dissertation Abstracts*, Vol. 25, pp.4475.

[29]Anderson, James, and Whittemore, Robert G., "Predictive Utility of Certain Criteria for Advanced Freshman Mathematics Courses", *The Mathematics Teacher*, 60:6 (October 1967), pp.619ff.

[30]Prouse, Howard, and Turner, V. Dean, "Factors Contributing to Success in Calculus 2", *Journal of Educational Research*, 62:10 (July-August 1969), pp.439ff.

[31]Woodby, *op. cit.*, pp.34-36.

A Testing Program in Math 20

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"Why can't you all do well on mathematics tests?" With this idea I presented a new testing scheme to my students in Math 20 last year. Each chapter test was written in triplicate and was of 40 minutes duration. Each of the questions, which were not multiple choice, was on a different part of the work covered in the chapter. This method made for a more interesting test than one in which the same question is asked more than once - for example, finding the length of a line segment given the end points. Also, when discussing the retests individually with students, all their work is there and their difficulties can be readily found. The three tests were more or less identical in format. On a test on logarithms, for example, the question appearing three times could be as follows:

Find by logs $(\sqrt[5]{369})^2$, $(\sqrt{4.69})^3$, and $(\sqrt[3]{2300})^2$.

Students were permitted to write one or two tests on previous chapters until mid-term. Then we started again. Considerable weight was given to these tests as they constituted 60 percent of their final mark. When a student wrote a retest, he received this mark if (and only if) it was higher than a previous mark. Only the best mark was kept on record, all others being obliterated. With this plan the class average for chapter tests for the semester was 70 percent. The average for the final exam was 68 percent. There was, of course, no retesting for the mid-term or the final. All 24 students received 50 percent or more at the end of the semester.

The retesting program was well received by the students. I never suggested that they rewrite - it was entirely up to them. This is an extremely important feature of the program. Some students wrote to attempt to get 50 percent while others wrote to raise a 70 percent mark to over 80 percent. This continuous testing plan made for incidental reviewing, as some of the students would be rewriting a Chapter One test while we were doing Chapter Three, and so on. Another asset was that, if a student missed a test, he could hear the discussion of it the next day and then use one of the rewrites to get his mark.

Students were encouraged to write the extra tests during their study periods at school. Some did not wish to use this time that way, and some others had no spare time. In those cases I trusted them to write their tests at home. The test was put into an envelope, sealed, and my initials written across the flap. The test was returned to me in a second envelope which the parent had signed.

This semester I am carrying out this plan with my current Math 20 class. It takes time but is well worth the effort. Try it!

ANNUAL CONFERENCE SPEAKERS

The Annual Mathematics Conference and Business Meeting of the Mathematics Council was held in Calgary on September 25 and 26. Speakers included *Father John Egsgard*, *Dr. Louis Cohen*, and *Howard Larson*.

The reports which follow are brief summaries of Dr. Cohen's and Mr. Larson's talks. The summaries were prepared by W. J. P. Turley of Western Canada High School, Calgary. Tapes of Father Egsgard's and Dr. Cohen's talks are available on request from the editor of the *Newsletter*; or, if reader response is sufficient, the complete talks can be printed in a future issue.

THE FIVE I's OF INDIVIDUALIZATION - *Dr. Louis S. Cohen*

The current reformation in education insists that the learner should explore ideas on his own. He should discover how to do this in a lab lesson or by individual instruction which could ultimately lead to a lab session.

Above all, individual instruction is the teacher's role, and this is probably the best way to bring about student participation. Task-oriented small group work may also be effective, or teachers must develop some specific pattern for a one-to-one relationship between pupil and teacher so that the learner could have frequent advice from someone who cares about him - to wit, the counseling technique.

It used to be education for all, but now this must be changed to education for each. Mass education must not be depersonalized, and so it should address itself to four sets of problem areas: (1) organizing curriculum, (2) organizing the school, (3) organizing the classroom, and (4) organizing personnel, time, and space.

The five i's are

1. *interrogation* (pre-test)
2. *interpretation* (diagnosis)
3. *instruction* (teaching)
4. *independent work* (practice)
5. *interrogation* (post-test)

MATHEMATICS AND MODERN LEARNING THEORY - *H. L. Larson*

Teachers of mathematics should evaluate their individual teaching method in the light of past and present developments in learning theory.

A brief review of four major learning theories indicates that all have one common structure. The teacher and the textbook reign supreme, and the student is given little incentive for individualization. However, modern research on learning theory has opened up a whole new era. The teacher and the textbook must be regarded less as authorities based upon *Absolutes*, but more as guidance persons.

The oldest of all learning theories is Mental Discipline, which suggests that the student's mind is like a muscle and merely needs exercising. Thus, rapid calculation and long addition columns are used. However, there was a backlash known as the period of the Romanticists. This philosophy, originated by Rousseau, claimed that man was born innocent and good. The job of the school and home was to see that his environment was kept pure so that the child could develop by doing what comes naturally. But this theory didn't work either as various kinds of anarchy set in. Technology required more of the hardware scientists with mathematics than the schools were producing.

Then came the theories arising out of Herbart's philosophy. The mind of man was like a receptacle, and the teachers manned the filling stations. Lecturing, work assignments and more lectures became the prime teaching method. The student presented himself before the teacher with the attitude: "Here I am, now teach me how to beat the system." Obviously the accent of mathematics teachers, like their peers, was on content - the student as a person was of lesser consideration. This theory, too, has been found to be wanting.

The Stimulus-Response theorists believed the human mind consisted mainly of neurons, ganglia and other physiological components that required certain kinds and frequent stimuli from external sources in order to obtain certain responses. Skinner's teaching machine has made considerable impression on teaching. But it also has had limited appeal.

However, modern learning theory would have us believe that a man is the product of both his genes and his interaction with environment. This places more emphasis upon the individual to build his own life style and have less faith in the absolutes handed down to him - because everything real is relative anyway. And changing, too!

Mathematics teachers might utilize this theory in a way similar to that which is described in the following example (this lesson was observed by the speaker in a public school system):

The teacher began with his Grade V class by insisting that students put away their rulers. Then he urged them to watch while he took a book and "measured" the length of a table. At first the response from his class was slow. He kept repeating, "How long is the table?", using also his hand, and a window stick. Finally the class began to catch on with real interest.

The teacher was attempting to isolate the major concepts of measurement: (a) arriving at a suitable first unit, (b) deciding on what to do about the piece at the end (precision). This was the first leg of the abstracting process called Analysis. In order to focus the students' attention on the roots of the concept, standard units were never mentioned. This is the second leg of abstracting called Differentiation - getting rid of distractions not necessary to understand the concept. Finally, the students were led into generalizing by leaving the linear aspect and getting into other dimensions. From there, students had the roots of the concept as tools for pursuing, on their own, other forms of measurement.

Little purpose is achieved by turning the students loose for self-study without first giving them some inspiration through basic concepts. This is about all teachers have time for anyway. In keeping with modern learning theory, students are given much more time to individualize if teachers concern themselves with isolating and teaching merely the roots of concepts.

Constitution of the Mathematics Council

as amended to September 26, 1970

The Constitution of MCATA was amended at the 1970 Annual Meeting. The amended Constitution is printed here for the information of members.

NAME - The name of this organization shall be THE MATHEMATICS COUNCIL OF THE ALBERTA TEACHERS' ASSOCIATION (MCATA).

OBJECT - The object of this organization shall be to promote and advance the teaching of mathematics throughout the province, especially in elementary and secondary schools.

MEMBERSHIP - (a) Any member of The Alberta Teachers' Association, or non-member covered by the Teachers' Retirement Fund.
(b) Any certificated teacher in private schools.
(c) Any member of the University of Alberta or Department of Education.

FEES - Membership fees may be established by resolution at the annual general meeting of this council.

FINANCES - The Executive Committee shall have power to collect fees and to make expenditures. A financial statement shall be submitted to the annual general meeting.

OFFICERS - The officers of this council shall consist of a president, a vice-president, a past president, a secretary and a treasurer, to be elected for a term of one year, by distributed ballot, and a member appointed by the Executive Council of The Alberta Teachers' Association.

EXECUTIVE COMMITTEE - The Executive Committee shall consist of the officers, one member from the faculty of education from a university in Alberta, one member from the Department of Mathematics of a university in Alberta, one member from the Department of Education and six directors to be appointed by the officers from the following: editor of the annual, editor of the newsletter, film coordinator, the chairmen of committees, the presidents of regional councils, members at large, provided that each university representative be appointed for a two-year term and also that the two university representatives not be from the same university and provided that the directors be appointed to ensure that the executive committee includes at least two representatives of each of elementary, junior high and senior high school teachers.

COMMITTEES - The Executive may appoint from time to time such committees as are necessary to carry on the work of the council.

LIAISON - Any communication regarding policy which this council wishes to make with any organization, government department, or other agency, within or without the province, shall be conducted through the Executive of The Alberta Teachers' Association or other regular channels of the Association.

REGIONAL COUNCILS - The Executive Committee of this council shall encourage the establishment of regional councils and shall have authority to determine regional boundaries and to establish regulations governing the organization of regional councils, consistent with this constitution.

REPORTS - The Executive Committee shall submit annually a written report of its activities to The Alberta Teachers' Association, prior to December 31.

AMENDMENTS - After three months' notice of motion to amend the constitution has been given to each member, this constitution may be amended by two-thirds majority vote of the members present at any annual general meeting of this council, subject to ratification by the Executive Council of The Alberta Teachers' Association.

GENERAL MEETINGS - The Mathematics Council shall hold an annual general meeting each year. At least 30 days' notice shall be given for all general meetings.

Report of the President

This report was presented to the Annual Meeting of MCATA, September 26, 1970. At the same meeting, Mr. Kean was re-elected to serve a second term. Mr. Kean is the head of the Mathematics Department at Lord Beaverbrook High School, Calgary.

James A. Kean

This is a report about the kind of year the executive of the Mathematics Council had. It began on September 27, 1969, and ended September 26, 1970.

The latest list of membership shows 333 members, three students, 14 subscriptions and 15 complimentary memberships. This is a figure close to the number of members in the Council a year ago.

The first executive meeting took place on Saturday, October 25, 1969, in the Calgary ATA office. At this meeting the five table officers and T. F. Rieger went over the different positions and duties of the executive council. The discussions that followed led to a change in the constitution.

Four other executive meetings were held in Edmonton (December), Red Deer (February), Calgary (May), and again Red Deer (September). Attendance ranged from 6 to 12.

MCATA executive must report that Dr. Mary Beaton, the editor of the *Newsletter* for the past three terms, has resigned her post. The council certainly owes a lot to the hard work and dedication of Miss Beaton. During the past year she edited five newsletters which were well received. A quote from the Department of Education of the State of Arkansas, who had used a newsletter item in their bulletin, said: "We think you have some excellent articles, and we hope that you would not mind our using one of them."

We know that Murray Falk, the new editor, has a big task on his hands, but we have come to expect an efficient and well-done job from him. The current *Yearbook*, whose theme is "Active Learning in Mathematics", should go to print before Christmas.

The films owned by MCATA continue to provide a service to school districts around the province. It is the desire of the executive council to expand our film program.

We sponsored the Ontario Junior Mathematics Contest in Alberta, providing a prize of $25 and a certificate to the top student in Alberta, as well as certificates for the second and third place candidates and a plaque for the top school.

We were the sole providers of a scholarship for the Canadian Math Congress exams in Alberta. The Council contributed $200 towards prizes in the provincial exams.

The Math Council will continue to offer support to meetings of other mathematics teachers' groups in Alberta by paying out-of-pocket expenses and helping with honoraria. Each request for such help in the future should be channeled through the president, and the executive reserves the right to grant or refuse, on the merits of each request.

MCATA is the parent body to two official regionals, and it looks as if soon there will be a third in the St. Paul area.

The executive find it very discouraging, to say the least, in facing the lack of real enthusiasm on the part of math teachers in general to become active in their own Math Council. However, we will continue to work towards this end as regional councils offer the one place for active participation.

Two members of the executive council attended the National Council of Teachers of Mathematics (NCTM) annual meeting in Washington D.C. in April. One member was sent to Toronto to participate in the ETV program sponsored by the Canadian Association of Mathematics Teachers at the expense of that organization.

Ed Olsen attended the summer conference of the ATA in Banff and reports that it was worthwhile. The editor of the *Newsletter* and the editor of the *Annual* attended the Editors' Conference at Barnett House in Edmonton in September.

The main task of this body continues to be the planning and preparing of the annual meeting. We trust that the time, effort and funds that are needed to put on this event are worthwhile.

The biggest disappointment during the year was the lack of response by the membership with respect to nominations for executive council. If it was not for a few die-hards taking control of the situation, the 300-plus members would be without anyone to carry on the workings of the organization.

Finally, I would like to thank all members of the executive for the job they have done this past year.

> Do you know the best way to get right answers on those Multiple-Choice tests?
>
> Use the "process of illumination"!

- Oregon Council of Teachers of Mathematics Newsletter December 1969

MISCELLANEA

CHANGE OF NAME OF THIS PUBLICATION

Let's face it, this publication is no longer a newsletter. Therefore, we feel that the name is no longer appropriate. On November 14, the Executive Committee granted permission for us to change the name. If you have a suggestion, send it to the Editor,

Murray R. Falk
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A small honorarium will be paid to the person whose title is used. Deadline is January 22, 1971 for receipt of suggestions.

CHARTER FLIGHT

If a sufficient number of members express their interest, the Mathematics Council is willing to arrange a charter flight to the 49th Annual Meeting of NCTM, April 14-17, 1971 in Anaheim, California. If you are interested, send your name to the President before January 31, 1971.

JUNIOR HIGH MATHEMATICS OPTION - References

A number of teachers are interested in a list of references and/or published materials for the junior high mathematics option. If you have a suggestion that you would like to share with your colleagues, send it to the Editor.

LETTERS TO THE EDITOR

Letters to the Editor of this *Newsletter* are welcome anytime. If you have a beef or a bouquet, we would like to hear from you.

APOLOGY

The Editor regrets that this issue does not contain any articles of special interest to elementary mathematics teachers. The reason is simple - no such article was received or otherwise brought to our attention. We can print only what we can get; you can help by submitting *your* article or directing our attention to an article which we could reprint. Deadline for the next issue is January 22, 1971.

Executive 1970-71, Mathematics Council

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Mathematics Council Newsletter is published several times a year. Editor: Murray R. Falk, 2112 Palisdale Road S. W., Calgary 14. Publisher: The Alberta Teachers' Association, 11010 - 142 Street, Edmonton. Editorial and production service - Hilda Lindae. All news items, articles, and correspondence about this newsletter should be addressed to the editor.

PRINTED AT BARNETT HOUSE