ABACUS

A PUBLICATION OF THE
ONTARIO ASSOCIATION for MATHEMATICS EDUCATION

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OAME WELCOMES YOU TO NCTM

—TORONTO NOV. 2-4

EXCELLENT PROGRAMS FOR ALL MATHEMATICS TEACHERS (Primary to Sr. Secondary)

AT THE ROYAL YORK HOTEL

SEE LAST PAGE FOR OAME MEMBERSHIP PRIZE DRAW.

YOUR MEMBERSHIP IN OAME INCLUDES
THE ABACUS YOU CAN COUNT ON IT!
WRITE TO THE SECRETARY TREASURER

OAME: Kingston in 1974, London in 1975.

1973 - 74 EXECUTIVE

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MESSAGE FROM THE PRESIDENT OF ONTARIO ASSOCIATION FOR MATHEMATICS EDUCATION

DAVID W. ALEXANDER

When this message reaches you the O.A.M.E. will be almost 6 months old. There have been some problems associated with the beginnings, but, already the new organization is showing how strengths of the O.M.C. and O.A.T.M. can be combined to create a more vital association.

Projects and people, projects with people, and projects for people are being launched. The chapters are organizing. The executive is instituting action which will result in the voice of O.A.M.E. being heard when decisions affecting Mathematics education are made.

This Newsletter represents one attempt to provide better communications between members. With this frequent informal publication and Gazette no member need feel that his ideas cannot be published. Submit an article now!

One of the first major projects of O.A.M.E. is hosting of the N.C.T.M. Toronto Meeting. The Program provides something for everyone. Come and join us on November 1-4.

And while you're marking that calendar set aside May 10-12 to come to the Annual meeting at Kingston.

ARE YOU A MEMBER?

ARE YOUR COLLEAGUES MEMBERS?

WHAT PROJECT DO YOU WANT UNDERTAKEN?

REMEMBER - THERE'S NO PLACE LIKE O.A.M.E.

FROM THE EDITOR

As Dave Alexander points out, we of the ABACUS are anxious to publish your ideas, particularly if they are directly applicable to the primary, junior or intermediate classroom.

Just as we were going to press we heard the good news that some unexpected funds will allow the Gazette to continue. This will allow us, even more than we had hoped, to concentrate on producing practical classroom ideas for you, in future issues.

SEND YOUR MATH GAMES, puzzles class activities, book reviews, ideas to:

THE ABACUS EDITOR
c/o C.C. CARROTHERS SCHOOL
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A Brief History of The Ontario Mathematics Commission

In the late 1950's great concern was felt for the school mathematics curriculum in Ontario. This concern was openly expressed in meetings of mathematics teachers held at Federation House, offices of the Ontario Teachers Federation, and at Lakefield, Ontario where a conference on the theme was convened in the summer of 1959.

The mathematics committee of O.T.F. professional development division together with the Ontario Curriculum Institute created the Ontario Mathematics Commission in 1960. It gained financial support from the Federation and from the Samuel Beatty Fund.

The Commission was composed of approximately fifty persons appointed from across the full spectrum of mathematics education in Ontario.

It was decided that experimental curriculum material for Grade 9 would be written and tested in about 35 classrooms of the province. The Department of Education approved of this action, appointed representatives, and granted additional financial support. The subsequent revisions in elementary and secondary mathematics curriculum throughout the 1960's were based upon this experimental work.

After ten years of work it seemed to the Department of Education that the initial purposes of the Commission had been fulfilled and so withdrew financial support. At the same time the Commission's executive began to review the role of the Commission. There had been a swing in the direction of professional development, and since this was the central purpose of O.A.T.M. it made sense to discuss with them the feasibility of a single organization having the combined objects of O.M.C. and O.A.T.M.

These discussions culminated in the formation of the Ontario Association for Mathematics Education in May, 1973.

At the North Bay Conference in May, the Ontario Association of Teachers of Mathematics disbanded to form, together with the Ontario Mathematics Commission, a new organization called the Ontario Association for Mathematics Education. The work of OATM and OMC will be carried on by this new organization.



A Eulogy on OATM
Given by Arn Harris
At the North Bay Meeting

"I feel tremendously honoured to have been asked to say a few words of tribute to the Ontario Association of teachers of Mathematics. We have belonged to an organization which is old, and I hope full of wisdom. It is great to be young and full of vigour - one evil of adolescence however is to be ashamed of ones parents. Children ought to be proud of their origins even if they are humble. OAME will be very much a child of the difficult pioneer beginnings of this province.

The first organization was the Ontario Educational Association which was founded in 1860, meeting every year during the Easter vacation. As early as 1873, there is evidence from the minutes that mathematics teachers attended OEA and sometimes had their say. However, there was a need for specialization. On January 18 in 1891 a group of Toronto mathematicians, 3 professors and 7 high school teachers met to consider the possibility of forming an association. In April of 1892, there was held the founding meeting of the Mathematical and Physical Association of Ontario. The first president was Mr. MacMurchy, the first secretary Mr. Fred F. Manley. There were 37 members.

From that small beginning grew the present. In 1951, the name was changed to Ontario Association of Teachers of Mathematics and Physics and the early 1960's we became OATM as the Physics teachers joined their Science colleagues.

Continued on Page 8

DIVISIBILITY RULE FOR SEVEN

None of the usual simple rules for divisibility apply to the prime number seven. Below is a little known rule, which is fairly practical, and its explanation gives one more good excuse to use the Distributive Property, the second most important concept of elementary mathematics, next after place value.

Let us use our method to check a couple of numbers first:

(a) Is 488 divisible by 7?

$$\begin{array}{r} 48\,|\,8 \\ -\ 16\,| \\ \hline 32 \end{array}$$

Since 32 is not divisible by 7, 488 is also not divisible.

(b) Is 266 divisible by 7?

$$\begin{array}{r} 26\,|\,6 \\ -\ 12\,| \\ \hline 14 \end{array}$$

Since 14 is divisible by 7, 266 is also divisible by 7.

What did we do? The ones place is isolated from the number, and multiplied by two, then this number is subtracted from the remainder of the number, beginning with the tens place. If the resulting number is divisible by 7, the original number is divisible by 7, and conversely. We note the process can be repeated, as shown in example c.

(c) Is 1667 divisible by 7?

$$\begin{array}{r} 166\,|\,7 \\ -\ \ 14\,| \\ \hline 15\,|\,2 \\ \ \ \ 4\,| \\ \hline 11 \end{array}$$

Since 11 is not divisible by 7, 1667 is not divisible by 7.

Why does the method work? We note that moving the product of the ones place digit and two, to the tens column is really equivalent to multiplying the ones place digit by twenty, and then subtracting it. Also, since we drop the ones place digit, this is equivalent to multiplying it by one, and then subtracting. Let us how this relative to example b above. The 14, or really 140 can be written as:

$$\begin{aligned} 140 &= 266 - 126 \\ &= 266 - (120 + 6) \\ &= 266 - [(20 \times 6) + (1 \times 6)] \\ &= 266 - (20 + 1) \times 6 \\ &= 266 - (21 \times 6) \end{aligned}$$

We note that 21 x 3 x 7, and hence we have reduced the original number, 266, by a multiple of 7. If a number is divisible by 7, then it is a multiple of 7. So by a finite number of reductions in the original number, of 21 times the ones place digit, we can reduce the size of the number to less than 100, which is recognizable as being a multiple of 7, or of not being such a multiple.

The above presentation could well be introduced in the material on primes and factors usually taught in grades 5 and 6.

Algebridge*

Here is a good game for a grade nine class which provides lots of practice in substitution but makes it seem like fun. All you need is four felt pens of different colours and 69 cards about 4 x 2 1/2 inches. Fifty-two of these are the playing cards, the other seventeen are replacement cards. On each of the playing cards, print one of the following algebraic expressions:

$(x^2 + 3x)$ $(x^3 - 2x)$ (x^2) (x^3)

$(2x^2 - 2x + 2)$ $(x^4 - x^2 + 1)$ $(x^3 + 2)$

$(7x - x^2)$ $(x^3 + x^2 + 1)$ $(4x - x^2)$

$(x^4 - 1)$ $(\frac{1}{2} x^3)$ $(x^3 + 7)$

Each of these expressions (or any other preferred ones) should appear on four cards in four colours representing the four suits. The replacement deck consists of four cards labelled with '4', four with '3', four with '2', four with '1' and one with '5'.

The game is played similarly to bridge. There are four players. The replacement set is shuffled and placed face down in the centre of the table. The playing cards are shuffled and dealt successively to each player until each has received thirteen cards. The player designated as North (by his seat) turns over the top replacement card; this is the value by which to replace the variable for that trick. (Note: a "trick" consists of one card played by each of the four players.) North now leads a card from any suit. All players must follow suit if they can; if they cannot, they may discard any card from their hand. However, if the card is not from the correct suit, it cannot win the trick. The winner of the trick is the player whose card has the highest value when x has been replaced by the value shown on the replacement card. It is now his turn to turn over the next value replacement card and lead a card. Play continues in this manner until all thirteen tricks are decided. The winning team is the one which wins most tricks.

* This was originally published in 'A Handbook of Aids for Teaching Junior-Senior High School Mathematics' by Stephen Krulik. It was published in 1971 by W.B. Saunders Company, 833 Oxford Street, Toronto M8Z 5T9.

WHAT DOES MATHEMATICS MEAN TO YOU?"

Your answers to this question are of value to the committee studying Mathematical Science in Canada.

On the 21st of August 1973 Mr. Alexander, the President of A.O.M.E., received a letter from the Science Council of Canada informing us that they are beginning a one-year study of the Mathematical Sciences in Canada, to explore the role of mathematics in Canadian science, education, industry and government.

The initiative for this study comes from the Canadian Mathematical Congress, and the study itself will be supervised by a Joint Committee whose members have been appointed by:

The Canadian Mathematics Congress
The Canadian Information Processing Society
The Canadian Operational Research Society
The Canadian Institute of Actuaries
The Statistical Science Association of Canada
The American Statistical Association (District II)

Surprisingly little though has been given to the Mathematical Sciences in Canada, although the need for long range policy planning in this area seems obvious. This study will attempt to provide an overall view of the role of Mathematics in Canadian science, education, government and industry.

Many people see a need for greater diversification of mathematical activities, with more emphasis on the interfaces between mathematics and other fields of human endeavour. This would involve new attitudes and approaches in teaching mathematics and consideration of interdisciplinary studies.

The study director, Professor John Coleman of Queen's University and his assistant Dr. Gordon Edwards are urging practitioners and users of mathematics to participate actively in the study - not only formulating their views in briefs and letters, but by engaging in a genuine dialogue with their colleagues. Study groups are being set up for this purpose within Universities, Colleges, professional Mathematical Societies and teachers associations.

Drs. Coleman and Edwards feel that the kind of interaction that may take place in these local study groups will do more to help shape policy decision in the Mathematical Sciences than any written report could possibly do.

The problems they have in mind are those of an immediate practical, down to earth nature. Their suggested list of problems for teachers of mathematics to consider is as follows:

1. Are students learning how to use mathematics effectively in their everyday lives?
2. Are students acquiring an understanding of the role that mathematics plays in contemporary society?
3. To what extent is mathematics presented as an enriching aspect of human culture?

4. Are students becoming "Mathematically Literate" in the sense that they recognize the utility of abstraction and are not afraid of symbols?
5. What have been the effects of the "New Math"?
6. Is teacher training adequate to the needs of mathematics teachers?
7. Is there sufficient communication and co-operation between primary school, secondary school and university teachers?
8. What are the chief obstacles to improving the quality of mathematics education at the pre-university level?
9. Should mathematics always be taught as a skill to be mastered, or should certain topics be presented in a more descriptive way in order to acquaint students with important mathematical aspects of modern thought and modern society?

O.A.M.E. urges its members to take an active part in this study, by forming study groups, writing letters and submitting briefs to:

Dr. Donald C. Attridge
1 Southdale Drive
Markham, Ontario
L3P 1J6

If you do not make your views known, you cannot expect them to be considered in the formulation of future policy. The deadline for input is 15th January 1974, so please do not delay.

Watch for your opportunity to participate in a session at NCTM, Toronto and/or send in your answers to the title question.

A Metric Crossbubble

The words in this crossbubble may be read up or down, forward, backwards or diagonally. The words are all related to metrication or with standardised measurements.

Put a 'bubble' around all the words you recognise; the words may overlap in any direction. When you finish you should have seven letters unaccounted for; these letters form the name of a scientist associated with a famous metric scale.

M E T R I C T N E C

I C H E C T A R E A

L D O L L A R N E N

L M E G A S T E N D

I I N L L I T R E E

M C N S M C I U S L

E R O E I E P I C A

T O T M L D E C I S

R R K I L O G R A M

E H T D E R D N U H

Continued from Page 3

The history of OATM and its predecessors has been very much symbolized by the names of the great teachers who have been presidents. Regretably, to my knowledge, there has only been one woman president, but a great one, Mrs. Jean Leppard. I hope that OAME can be better in that regard. I should like to mention just two or three who touched my own life in special ways. John Lougheed, 1917, who later was the Mathematics professor at the Ontario College of Education, and who was a great inspiration to me as a student teacher.

Everitt Hall 1935, who was my department head at London Central Collegiate Institute for 9 happy years in the post-war years. He was a great man who combined teaching and scholarship with great human concern for his fellow man in his work with the CCF party.

Eugene Durrant who was co-author of a very popular mathematics text book was a provincial inspiration for a few years. I remember his quiet advice and encouragement while adjusting to the return to teaching after World War 2.

Finally I'd like to pay tribute to Dr. Gordon Rubard Magee a former honorary president, who has always been a strong university supporter of our organization. I remember him for many things but especially as a masterful teacher of Mathematics in my days as an undergraduate.

Ladies and gentlemen, these are the men I chose, think about, and honour for their contributions to our Associations of Mathematics teachers.

Friends, particularly my young friends who must take over the new organization, remember that it has a proud if only small beginnings. OAME will be formed by the marriage of complementary bodies OATM & OMC both of which in their different ways contributed to the spread of good mathematics teaching across Ontario.

Now it is off with the old and on with the new. Before we go will you join me by standing and helping me to give a standing ovation to all of its presidents and executives over that last 82 years."

If $3(\overline{OWN}) = \overline{SOWS}$ (S, N, O, W represent distinct whole numbers.)

What is the number given by $(\overline{SOWS} + 1)$?

PRIZE DRAW

At the N.C.T.M. meeting, a draw for prizes will be made from the names of those taking out an O.A.M.E. membership before 3 November 1973. RENEW your membership today or see Joan Routledge, Membership and Publicity Committee.

CHAPTER NEWS - REGION REPORTS

(Brief Announcements or Reports from Chapters will be published here - Chapter Secretaries please note)

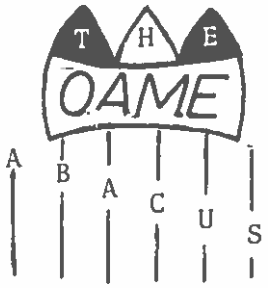
- N.O.M.A. CONFERENCE
  On October 13 the Northern Ontario Mathematics Association held an interesting conference on Maths and the Machine at Cambrian College.
- O.A.M.E. WESTERN ONTARIO MEMBERS - The regular fall conference has been withdrawn this November in order to make it possible for as many teachers as possible to attend N.C.T.M. - Toronto. A regional winter conference may be held.

ARTICLE CREDITS

Divisibility Rule - Frank Rogers in Mathematics in Michigan
Algabridge - O.M.C. Secondary Committee
Metric Crossbubble- Nova News
Other items from - Fanshawe Recreation Math and London Math Memo

THINK CORNER

1. If you went to bed at 8 o'clock and set the alarm to get you up at 9 o'clock how many hours sleep would you get?
2. Do they have a first of July in England?
3. How many birthdays does the average man have?
4. Why can't a man living in Toronto be buried west of the Rocky Mountains?
5. If you had only one match and entered a room in which there was a kerosene lamp, an oil heater, and a wood-burning stove, which would you light first?
6. Some months have 30 days and some have 31. How many have 28?
7. If a doctor gave you three pills and told you to take on every half hour, how long would they last?
8. A man builds a house with four sides to it, rectangular in shape. Each side has a southern exposure. A big bear wanders by. What is the colour of the bear?
9. How far can a dog run into the woods?
10. What 4 words appear on every U.S. coin?
11. I have in my hand 2 Canadian coins which total 55 cents in value. One is not a 5 cent piece; please bear this in mind. What are the two coins?
12. A farmer has 17 sheep. All but 9 die. How many does he have left?
13. Divide 30 by 1/2 and add 10. What is the answer?
14. Take two apples from three apples and what do you have?
15. An archaeologist claims that he found some gold coins marked 46 B.C. Do you think he did?
16. How many animals of each species did Moses take on the ark?
17. Is it legal in Canada for a man to marry his widow's sister?
18. A woman gives a beggar 50 cents. The woman is the beggar's sister. The beggar is not the woman's brother. Who is this?
19. What word is mispelled in this test?



"MATHEMATICS EDUCATORS
SHARE THEIR IDEAS"