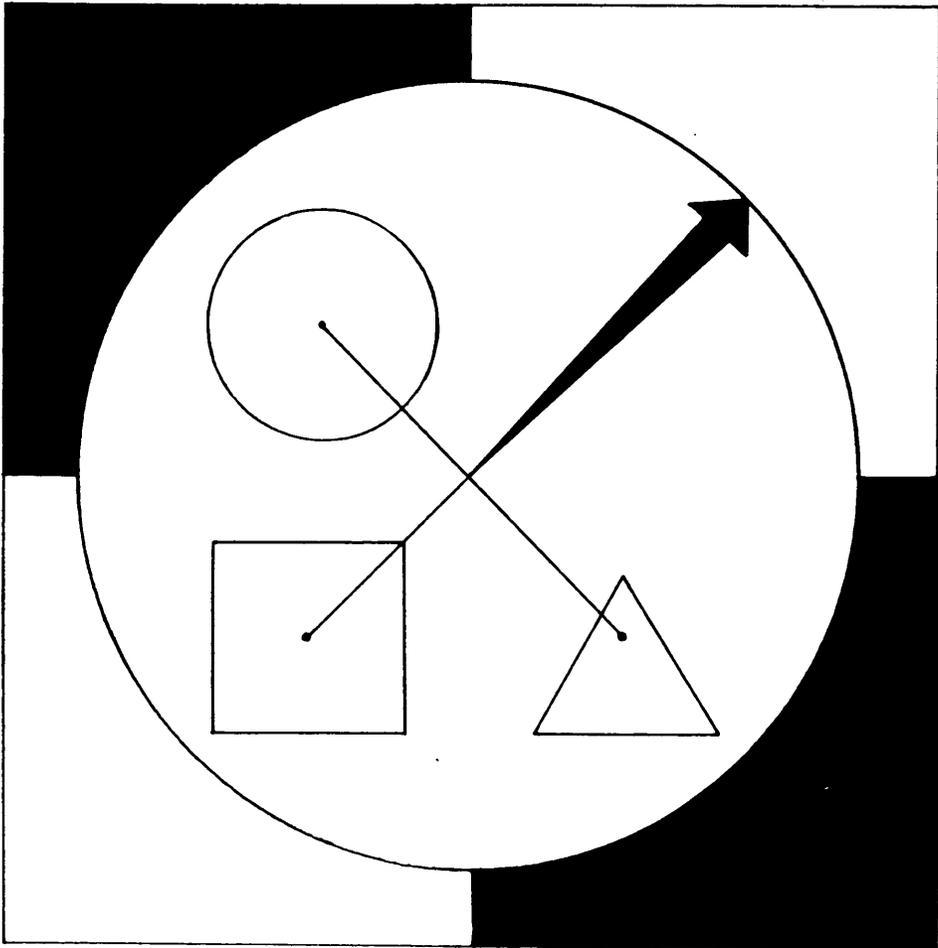


Vector

BRITISH COLUMBIA ASSOCIATION OF MATHEMATICS TEACHERS

NEWSLETTER



VOLUME 12, NUMBER 2

JANUARY 1971

BCAMT EXECUTIVE

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The B.C. Association of Mathematics Teachers publishes *Vector* (newsletter) and *Teaching Mathematics* (journal). Membership in the association is \$4.00 a year. Any person interested in mathematics education in British Columbia is eligible for membership in the BCAMT. Journals may be purchased at a single copy rate of \$1.50. Please direct enquiries to the Publications Chairman.

Elections

Now is the time for you to become actively involved in the BCAMT. You probably know someone who would do an excellent job in an executive position. Help the association become more like what you want it to be.

Positions open are:

President	2 year term
Vice-president	1 year term
Publications Chairman	2 year term
Secretary	2 year term
Treasurer	1 year term

Requirements of the constitution are:

1. Nominations may be submitted by any member.
2. Term of office runs from July 1 to June 30.
3. Nominations shall close at midnight January 31.
4. Members will receive a ballot on/or before February 15.
5. Ballots must be returned to the Director of Professional Development (BCTF) postmarked not later than midnight, March 1.

Get involved. Send your nomination to the Publications Chairman (see inside cover) now.

Late Membership Editorial

Each year we have a problem with BCAMT memberships. The BCTF has as specific policy that the deadline for memberships in PSAs is November 15. Any applications received after that date are returned; they are not processed. The major reasons for this policy seem to be:

1. The BCTF needs a specific date at which to determine the membership for grant purposes.
2. To facilitate preparation of membership lists and mailing plates.

The executive of BCAMT must abide by BCTF policy and certainly needs your membership before November 15 so that it gets the BCTF grant. However, if you know of any person

who wanted membership and was refused it or any person desiring membership now, please have that person get in touch with the Publications Chairman, BCAMT, c/o BCTF, #105 - 2235 Burrard Street, Vancouver 9.
Better late than never.

J. W. Turnbull

BCAMT Publications

The BCAMT has completed arrangements with the BCTF Lesson Aids service to publish what it hopes will be the first in a series of student-oriented monographs. Neither the date of publication nor the final price has been confirmed, but the first publication should be available before the end of this school year, at a cost of less than \$1.00 a copy.

The first monograph, entitled Binomial Expansions, written by Geoff Horner of Abbotsford, can be used at any level from Grade 9 up. It will be of particular use to teachers of Math 12, either to introduce the topic or for remedial work. While a class set may not be necessary, certainly about 10 copies a class would be of real help. And the price would not be prohibitive, seeing that the monograph may be re-used if it is treated carefully.

Contents: After the topic has been introduced, a discovery approach is used to compare the coefficients of terms in a binomial expansion with Pascal's Triangle. The same method is then employed to 'discover' other patterns in the expansion. Later, both a recursive formula, and a general formula for any term, are presented and their uses illustrated. Practice exercises and solutions are included in the text.

The programmed instruction type of format suits the topic, and makes it easy for students to follow the step-by-step development.

For future publications, the BCAMT invites submissions from its members. To provide an incentive, the association is offering a modest honorarium to teachers who send in materials suitable for publication, either for enrichment or for remedial work. We desperately need materials that are appropriate to the B. C. curriculum. While the committee cannot undertake extensive editing, it will attempt to make

suggestions if improvements are needed. So by all means send in your material in the form in which you use it in class -- don't wait to polish it. Address your manuscript to:

BCAMT Supplementary Publications,
c/o 33675 Marshall Road,
Abbotsford, B. C.

1971 Annual General Meeting BCAMT

This year the annual general meeting of the BCAMT will be held on Tuesday, April 13. Neither the location nor the times are as yet confirmed, but the program will deal with supplementary materials. We plan to expose you to:

1. BCAMT supplementary booklets. (Lesson Aids -- under \$1)
2. BCAMT cassette topic tapes
3. NCTM films
4. several book publishers

All this and more. Plan to attend, during Easter week, on Tuesday, April 13.

In-service

The following was sent to the In-service Chairman in each school district. If your in-service chairman has not approached you, perhaps you should approach him.

November 10, 1970

MEMO: To In-service Chairmen of Local Associations of the
BCTF

The British Columbia Association of Mathematics Teachers is requesting your assistance in two areas. First, we would like to know if there is a formally organized group of mathematics teachers in your district. If so, we would invite such a group to affiliate with the BCAMT. Article 11 of the BCAMT constitution deals with the formation of local chapters and reads as follows:

(a) The teachers within any Local Association (as defined by the BCTF Constitution) or any group of local associations may apply to the executive for recognition as a Local Chapter.

(b) The Chairman of any Local Chapter (or his nominee) may sit on the Executive. Where such representation, in the opinion of the Executive, is a financial burden on the Association, the Chapter representative shall be deemed a corresponding member of the Executive.

(c) The Executive shall have the authority to refuse recognition of Local Chapters and to establish regulations governing the organization and operation of Local Chapters.

If there is no local group in your district, perhaps you could pass this information on to some person who might be interested in forming a group.

Our second concern is with respect to the mathematics textbooks and curriculum for the province of British Columbia. At a recent meeting held in conjunction with the Northwest Mathematics Conference in Victoria, it was suggested that mathematics teachers throughout the province have had no opportunity to make their views concerning these matters known. Since revision procedures have been started, it becomes of paramount importance for them to be given this opportunity. We therefore invite teachers from your district to list their specific dissatisfactions with mathematics textbooks and/or B. C. mathematics curriculum. We would also like any positive suggestions for revision to be included. Suggestions from either groups or individuals will be welcomed.

We hope that you will be able to give us some assistance in our endeavors by (a) contacting subject chairmen or mathematics department heads and requesting them to consider these items with teachers and (b) giving these matters publicity through your regular avenues of communication with the teachers of your district.

Your co-operation is much appreciated.

President:

Leonard J. Gamble,
R. R. #2,
Clearwater, B. C.

Corresponding Secretary:

Miss Isabel C. Leask,
#306 - 157 East 21st Street,
North Vancouver, B. C.

Workshops

The following is a description of the plan for an extensive mathematics workshop program being conducted in Courtenay School District this year. (The plan has changed according to needs of teachers since October.) Perhaps the description will provide a stimulus for individuals in other school districts. Perhaps even within our own association.

Further details can be obtained from Mr. Zola or from Mr. Roy Ronaghan at the BCTF office.

In-service Newsletter #3
In-service Co-ordinator
Mr. Meguido Zola
Courtenay School District

ELEMENTARY SCHOOL MATHEMATICS PROJECT: BASED EXCLUSIVELY
IN TWO SCHOOLS, COURTENAY ELEMENTARY AND VILLAGE PARK
ELEMENTARY: TO BE HELD BETWEEN OCTOBER 1970 AND JUNE 1971

- A. Thursday, 8 October Orientation to the project and to B.

- B. Friday, 16 October Northwest Mathematics Conference.
Saturday, 17 October Attendance by a total of 10 teachers from the two schools. This would serve as a stimulus to the on-going project.

- C. October/November *Evaluation Workshop*
A workshop to follow-up the Northwest Mathematics Conference. Reports, discussion, implications.

- D. October/November *Orientation Workshop*
A workshop designed to provide opportunity for teachers to examine new materials in mathematics and to identify specific problems in this field, e.g.,

* Nuffield Res. Found. Films: 'Maths Alive'; 'I Do and I Understand.' Nuffield Books and Games.

* 'Cole' Boxes (Trivett's Cole Project at SFU)

* Strands Analysis (A developmental program broken into seven major strands).

E. November/June

'How To' Workshops

A series of workshops designed to involve teachers in skill-building experiences. How to teach mathematics.

F. November/June

Consultative Services

The provision of a professional consultant for classroom visiting on a regular basis.

G. November/June

Miscellaneous

Other relevant activities through the year, e.g., attendance at the Mathematics Week Teach-In in Vancouver, December 1970.

COST

A C D G and materials approximately \$500 total including substitutes and after BCTF part-subsidy of visiting consultants, etc.

B Approximately \$400.

E Workshops November, December or January, February, March, April, May, June -- total of seven @ \$300.00 each including (1) cost of subs. (2) cost of resource person, which will be half subsidized by BCTF grant. *Total: \$2100.*

F Three days a month during eight months -- 24 days @ approximately \$50 a day after part-subsidy from BCTF. *Total: \$1200.*

Total Cost of Project \$4000 as a Maximum

This project will be continuously recorded and evaluated. At the conclusion of the project, extrapolation will be made for a series of small workshops to be held for elementary mathematics teachers on a district-wide basis during 1971-72.

Using Cassette Tapes

For two years I have been developing a library of Cassette tapes for use in Chemistry 11; and because they have proven successful, I am now beginning to do the same for Math 12.

Cassette tapes are both convenient and inexpensive. Portable cassette recorders for use in the classroom are well within the school's budget, and large numbers of the students have access to their own. In chemistry, students use the tapes in two ways -- they listen in class (they're working on a continuous progress basis) or they take them home overnight. (If you're thinking of trying it, make a copy of your tape, using two tape recorders and a patch cord, and put the duplicate into service.)

Cassette tapes would be useful in mathematics for enrichment and for remedial work. A library of tapes would be a great help both for a student who is absent from a class and for a student who didn't comprehend the lesson fully. With tapes, a student can go at his own speed, turning off the tape-recorder to think the topic over, or rewinding to listen again to a portion.

When I suggested a cassette tape library to the executive of the BCAMT, it deemed the idea to have merit. As a result, we approached Mrs. Isobel Cull, who has responsibility for the Lesson Aids Service. She is going to investigate the matter further, particularly with regard to the duplicating of tapes on a commercial basis.

May I encourage teachers to try this medium. If we find that it is practical to distribute this type of lesson aid, we could then offer a modest honorarium to each person who contributes a suitable tape, and thereby quickly build an extensive library of tapes, which could be purchased by teachers, students or school boards.

If you have any comments, suggestions, ideas -- please send them in. If you know of anyone who is already doing this kind of work, I'd like to hear about it. Here is the answer to our two most crying needs -- enrichment for the few, and review for the many who need it.

Geoff Horner
Abbotsford Senior Secondary School

Multiplication

(Saskatchewan MTS Journal
Vol. 9, No. 1, January 1970)

Powers of 2. This will stimulate considerable interest to students who like to explore. *Any number can be expressed as a sum of powers of 2.*

Powers of 2 are: $2^0=1$, $2^1=2$, $2^2=4$, $2^3=8$, $2^4=16$, $2^5=32$, etc.

$$\begin{aligned}
 37 \times 86 &= (32 + 4 + 1) 86 && 86 \\
 &= (32 \times 86) + (4 \times 86) + (1 \times 86) && (2 \times 86) \quad 172 \\
 &\text{(Here we make a table of doubles for 86)} && (4 \times 86) \quad 344 \\
 &&& (8 \times 86) \quad 688 \\
 &&& (16 \times 86) \quad 1376 \\
 &\text{From the table at the right, draw lines} && (32 \times 86) \quad 2752 \\
 &\text{through the unrequired products.} &&
 \end{aligned}$$

$$\begin{aligned}
 37 \times 86 &= \text{the sum of the remaining multiples of 86} && 86 \\
 &&& \underline{172} \\
 &&& 344 \\
 &&& \underline{688} \\
 &&& \underline{1376} \\
 &&& \underline{2752} \\
 &&& \underline{3182}
 \end{aligned}$$

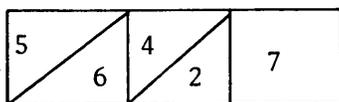
Peasant multiplication: Halves and doubles technique.

(a) Note the table; disregard the remainders of halving.	37	86
	18	172
	9	344
	4	688
	2	1376
	1	2752
(b) Draw a line through every row which has an even number in the left (halves) column.	37	86
	18	172
	9	344
	4	688
	2	1376
	1	2752
(c) Now add the numbers on the right.		<u>3182</u>

Napier's Bones: A rather mechanical method. From tongue depressors or sticks, models are easy to construct. Ten sticks are needed -- one stick is used for each number 1 to 9 as shown here and the additional stick has just the numbers 1 to 9 as shown on the extreme right.

To multiply 37×86 select the 8-stick and the 6-stick and place them in that order beside each other with the digits stick on their right.

Now read the numbers to the left of the 7



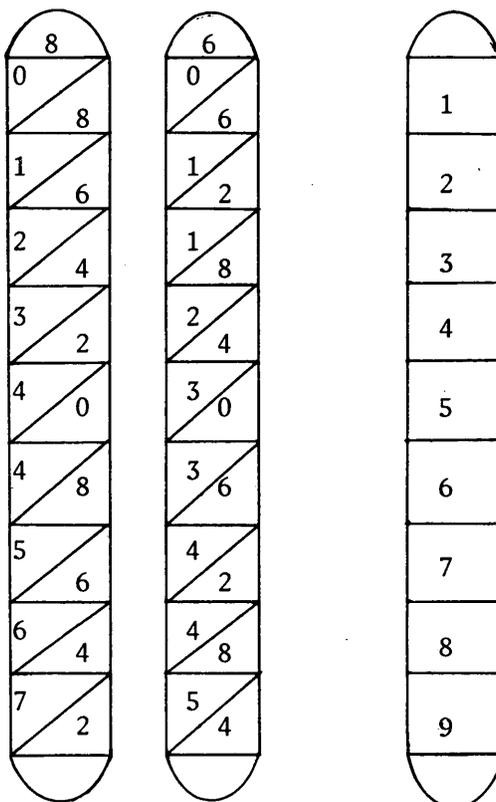
Add numbers on the slant. (First write) the 2. (Next add) 6 and 4 = 10 -- write the 0 and carry 1. 5 and 1 to obtain 6. *This gives 602.*

Then read the numbers to the left of the 3 and perform the same addition to get 258. A 0 must be added, since multiplication is by 30.

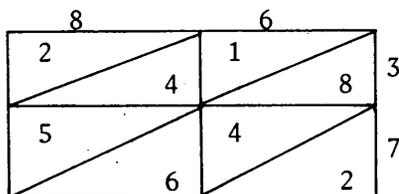
Now add 602 and 2580, to get 3182.

This may provide nothing more than a stimulus to learn more, to read historical data and bring such information to the classroom.

The use of a grid. This procedure could be worked out from Napier's bones. The boxes are filled by multiplication in the appropriate column and row numbers.



Complete the slant addition, 'carrying' where necessary. Reading down and to the left you get *the answer 3182*.



National Council of Teachers of Mathematics

The following NCTM publications are available from Dr. Tom Howitz, Faculty of Education, UBC.

<i>Title</i>	<i>Each</i>
Administrative Responsibility	\$.50
Computer-assisted Instruction	2.00
Computer Facilities for Mathematics Instruction	.90
'Experiences in Mathematical Discovery'	
1: Formulas, Graphs, and Patterns	.50
2: Properties of Operations with Numbers	.50
3: Mathematical Sentences	.50
4: Geometry	.50
5: Arrangements and Selections	.50
High School Mathematics Library	1.00
In-service Education	.90
Introduction to an Algorithmic Language (Basic)	1.40
Mathematical Challenges	.80
Mathematic Clubs	.75
Math. for Elem. Sch. Teachers (hardback)	3.00
Math. for Elem. Sch. Teachers	1.50
Mathematics Library -- Elementary and Jr. High	.90
Portrait of 2	.75
Research and Development in Education: Mathematics	2.00
School Mathematics Contests	.90

Some Ideas About Number Theory	.60
Soviet Secondary Schools for the Mathematically Talented	2.00
'Topics in Mathematics for Elementary School Teachers'	
1: Sets	.45
2: The Whole Numbers	.55
3: Numeration Systems: Whole Numbers	.45
4: Algorithmas	.45
5: Numbers and Their Factors	.45
6: The Rational Numbers	.45
7: Numeration Systems: Rational Numbers	.45
8: Number Sentences	.45
9: The System of Integers	.65
10: The System of Rational Numbers	.65
11: The System of Real Numbers	.65
12: Logic	.65
13: Graphs, Relations, and Functions	.65
14: Informal Geometry	.65
15: Measurement	.45
16: Collecting, Organizing and Interpreting Data	.65
17: Hints for Problem Solving	.65
18: Symmetry, Congruence, and Similarity	.65
20th Century Algebra	.70
Vectors in Three Dimensional Geometry	.60
21st YB, Learning of Mathematics	4.00
25th YB, Instruction in Arithmetic	4.50
26th YB, Evaluation in Mathematics	3.00
27th YB, Enrichment Math. -- Grades	4.00
27th YB, (paperback)	2.50
28th YB, Enrichment Math -- High School	4.00
28th YB, (paperback)	2.50
29th YB, Topics in Mathematics	4.00

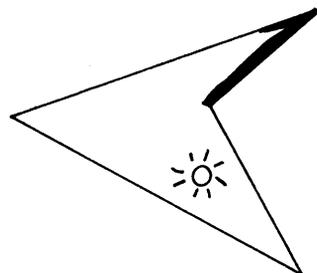
Student Mathematics

I have received a copy of *Student Mathematics* to bring to your attention. It is produced by the Toronto Metropolitan Inter Schools Mathematics Club, which says, 'We do not plan to appear at regular intervals, but to publish an issue whenever we have sufficient material' and also 'we should welcome correspondents, reporters and associate editors A Mari Usque Ad Mare.' Single copies can be sent readers in Canada for 10 cents, provided a stamped, self-addressed envelope (at least 9" x 4") is enclosed with the order. I think you would find it worth while to make the small investment to see a copy for yourself.

The Secretary,
Student Mathematics,
Room 373, College of Education,
371 Bloor Street West,
Toronto, Ontario.

The Light in the Garden

(From *Student Mathematics*, May 1970)



The illustration shows a lamp standing inside a garden. It will be seen that one wall is completely in the shade, while one wall is partly in shadow. Two walls are completely illuminated. Is it possible to design a garden and place a lamp at a point inside it so that some part of each wall is in shadow? There is no trick in this question. The lamp is not covered, there are no obstacles to light inside the garden, and of course we are concerned with illuminating the inside of the walls.

Suppose the lamp is outside the walls, and we are now concerned about the light on the outer side of the walls. Is it possible to design a lamp somewhere outside it so that

some part of each wall is in shadow? Here again the garden is to be a polygon, and there is no trick involved.

The Gelfand Club

(From *Student Mathematics*, May 1970)

This club is designed to interest talented students in different aspects of mathematics. At the beginning of each month, definitions, exercises and problems are sent to members, who return their solutions to the club for criticism. Anyone may obtain a problem set by sending a stamped self-addressed envelope (9" x 12") to:

The Gelfand Club,
Mathematics Department,
University of Toronto,
Toronto 5, Ontario.

The Junior Mathematics Contest

(Sponsored by the University of Waterloo)

The contest is open to Grade 9, 10 and 11 students and is to be held on Wednesday, March 31, 1971. Competition will again include students from Ontario to British Columbia. The school with the highest team score will receive the University of Waterloo Shield for one year. Cash prizes for individuals in British Columbia who earn top scores will also be awarded. If you have not received notice of this contest at your school, write:

Prof. E. Kennedy,
Department of Mathematics,
University of Victoria,
Victoria, B. C.

Deadline for registration is February 7, 1971.

Logic Problem

Smith, Brown, Jones and Williams had dinner together the other night. When they parted, each of them, by mistake, was wearing the hat belonging to one other member of the party and the coat belonging to another. The man who took Williams's hat took Jones's coat. The hat taken by Jones belonged to the owner of the coat taken by Williams. Smith took Brown's hat. Who took Smith's coat?

The Empty Column

A Parable About a 'New Notation' of Long Ago

By Dr. K. E. Iverson of IBM Corporation,
Ontario Mathematics Gazette,
Vol. 6, No. 3, May 1968.

Many years ago a Roman civil engineer, who was a high official in Alexandria, was approached by a young Arabian mathematician with an idea which the Easterner believed would be of much value to the Roman Government in their road-building, navigating, tax-collecting, and census-taking activities. As the Arabian explained in his manuscript, he had discovered a new type of notation for number writing, which was inspired from some Hindu inscriptions.

The Roman official presumably studied this manuscript very carefully for several hours, then wrote the following reply:

Your courier brought your proposal at a time when my duties were light, so fortunately I have had the opportunity to study it carefully, and am glad to be able to submit these detailed comments. Your new notation may have a number of merits, as you claim, but it is doubtful whether it ever would be of any practical value to the Roman Empire.

Even if authorized by the Emperor himself, as a proposal of this magnitude would have to be, it would be vigorously opposed by the populace, principally because those who had to use it would not sympathize with your radical ideas. Our scribes complain loudly that they have too many letters in the Roman alphabet as it is, and now you propose these ten additional symbols of your number system, namely

1, 2, 3, 4, 5, 6, 7, 8, 9, and your 0.

It is clear that your 1-mark has the same meaning as our mark-I, but since this mark-I already is a well-established character, why is there any need for yours?

Then you explain that last circle-mark, like our letter 0, as representing 'an empty column,' or meaning nothing. If it means nothing, what is the purpose of writing it? I cannot see that it is serving any useful purpose; but to make sure, I asked my assistant to read this section, and he drew the same conclusion.

You say that the number 01 means the same as just 1. This is an intolerable ambiguity and could not be permitted in any legal Roman documents. Your notation has other ambiguities which seem even worse: You explain that the mark-1 means ONE, yet on the very same page you show it to mean TEN in 10, and one HUNDRED in your 100. If my official duties had not been light while reading this, I would have stopped here; you must realize that examiners will not pay much attention to material containing such obvious errors.

Further on, you claim that your system of enumeration is much simpler than with Roman numerals. I regret to advise that I have examined this point very carefully and must conclude otherwise. For example, counting up to FIVE, you require *five* new symbols whereas we Romans accomplish this with just *two* old ones, the mark-I and the mark-V. At first sight the combination IV (meaning ONE before FIVE) for four may seem less direct than the old IIII, but note that this alert representation involves LESS EFFORT, and that gain is the conquering

principle of the Empire.

Counting up to twenty (the commonest counting range among the populace), you require *ten* symbols whereas we now need but three: the I, V, and X. Note particularly the pictorial suggestiveness of the V as *half* of the X. Moreover, it is pictorially evident that XX means ten-and-ten, and this seems much preferred over your 20. These pictorial associations are very important to the lower classes, for as the African says, 'Picture tells thousand words.'

You claim that your numbers as a whole are briefer than the Roman numerals, but this is not made evident in your proofs. Even if true, it is doubtful that this would mean much to the welfare of the Empire, since numbers account for only a small fraction of the written records; and in any case there are plenty of slaves with plenty of time to do this work.

When you attempt to show that you can manipulate these numbers much more readily than Roman numerals, your explanations are particularly bad and obscure. For example, you show in one addition that 2 and 3 equal 5, yet in the case which you write as:

$$\begin{array}{r} 79 \\ + 16 \\ \hline 95 \end{array}$$

this indicates that 9 and 6 also equal 5. How can this be? While that is not clear, it is evident that the other part is in error, for we know that 7 and 1 equal 8, not 9.

Your so-called 'repeating and dividing' tables also require much more explanation, and possibly correction of errors. I can see that your 'Nine Times' Table gives sets which add up to nine, namely: 18 27 36 45 54 63 72 81 and 90 but I see no such useful correlation in the 'Seven Times' table, for example. Since we have SEVEN, not nine, days in the Roman week, it seems far more important to have a system that gives more sensible combinations in this 'Seven Times' table.

All in all, I would advise you to forget this overly ambitious proposal, return to your sand piles, and leave the number writing to the official Census Takers and Tax Collectors. I am sure that they give these matters a great deal more thought than you or I can.

**Ideas from the Mathematics Council
(Alberta Teachers' Association)**

1. MAGIC SQUARE PUZZLE

A	B	C
D	E	F
G	H	I

Can you make a magic square based on these clues?

- A. 60 mi. per hr. = _____ feet per sec.
- B. 1 metre = approx. _____ inches.
- C. The cube root of 405,224.
- D. Jerry is 23 years younger than Tom. In one year Tom will be twice as old as Jerry was 3 years ago. How old is Tom?
- E. Peter Manybrains, a nine-year old boy in Grade 8, wrote an examination consisting of 58 problems and succeeded in solving 39 of them. What mark did he receive?
- F. Four score and one.
- G. The measure in degrees of an angle is an equilateral triangle.
- H. The principal square root of 9025.
- I. Double the sum of the first seven prime numbers; then subtract 5 times the cube root of 1728.

2. MULTIPLICATION EXERCISES

If you square 408, you get 166,464, whereas if you square 804, you get 646,416.

Try (a)	409^2	(b)	407^2	(c)	406^2
	904^2		704^2		604^2
(d)	405^2	(e)	506^2	(f)	507^2
	504^2		605^2		705^2

Perhaps you can suggest a shortcut. Does it always work?

Try 708^2 and 807^2 .

3. ODDITIES

When you multiply 483 by 12 you get a result of 5796. Every digit but 0 is found precisely once in the multiplier, multiplicand, or product.

- Try
- A. 42×138
 - B. 18×297
 - C. 27×198

Free Materials

1. Dr. A. P. Shulte, Director,
Oakland County Mathematics Project,
Oakland Schools,
2100 Pontiac Lake Road,
Pontiac, Michigan 48054

Ask for information on the Oakland County Mathematics Project. You will receive a description of the project and available materials for Grades 9 and 10.

2. Tecnica Education Corporation,
655 Skyway,
San Carlos, California 94070

Ask for a copy of *Teach Yourself Basic* and descriptive materials of their resource packages.

3. Creative Publications,
P.O. Box 328,
Palo Alto, California 94302

Ask for their catalog. You will find it very interesting.

4. Ginn and Company,
35 Mobile Drive,
Toronto 16, Ontario.

Ask for descriptive materials on 'Essentials of Mathematics' (Sobel, Maletsky, Hill). The company will probably send you a 32-page booklet of puzzles and enrichment from the text.

5. Thomas Nelson and Sons (Canada) Ltd.,
81 Curlew Drive,
Don Mills, Ontario.

The Houghton Mifflin Company of America has made available to the Thomas Nelson & Sons (Canada) Limited Company in Ontario a series of *19 bulletins on modern mathematics*.

These bulletins on modern mathematics *may be obtained free of charge* simply by writing to the company mentioned above.

The following are the titles of the Bulletins.

Service Bulletin No.	Title
1.	Induction in Mathematics
2.	On the Meaning and Use of Absolute Value
3.	The Logarithmic Function
4.	Postulates -- the Bylaws of Mathematics
5.	Complex Numbers
6.	Groups
7.	Reading Assignments for First-Year Algebra Students
8.	An Introduction to Generating Functions
9.	Partitioning the Integers
10.	Reading Assignments for Students in Second-Year Algebra and Trigonometry
11.	Translations of Axes
12.	What are Barycentric Co-ordinates?
13.	Finite Models and Mathematical Structures

14. Some Mathematical Processes with
Experimental Data
 15. Patterns with Pythagorean Triples
 16. Revisiting Division in the General
Mathematics Class
 17. The Teaching of Verbal Problems in the
High School Algebra Class
 18. Sum Notation and Summation
 19. A Diagram Approach to the Teaching of
Geometric Proofs
6. See enclosure.