

## WHAT IS MODERN MATHEMATICS?

Editors' Note: Elizabeth Galeski was a student in the Faculty of Education. She completed the professional year leading to certification following a Bachelor of Science degree.

One of the phrases which we, as prospective teachers, hear over and over again is "modern mathematics". In attempting to learn something about this, one might take each word individually and try to form a satisfactory definition for each. From the standpoint of inexperience, one must turn to a search of the works of the more experienced and wise mathematicians of this era to find an answer to the question "What is Modern Mathematics". First a record of some of the definitions of mathematics:

"The purely formal sciences, logic and mathematics, deal with those relations which are, or can be, independent of the particular content or the substance of objects." (Herman Hankel) (1: 176-177)

"Perhaps the least inadequate description of the general scope of modern Pure Mathematics - I will not call it a definition - would be to say that it deals with form in a very general sense of the term." (Hobson) (1: 176-177)

"Mathematics in its widest signification is the development of all types of formal, necessary, deductive reasoning." (Whitehead) (1: 176-177)

"Mathematics is the study of ideal constructions (often applicable to real problems), and the discovery thereby of relations between the parts of these constructions, before unknown." (Pierce) (1: 176-177)

"Mathematics is preferably free in its development and is subject only to the obvious consideration, that its concepts must be free from contradictions in themselves, as well as definitely and orderly related by means of definitions to the previously existing and established concepts." (Cantor) (1: 176-177)

"Mathematicians assume the right to choose, within the limits of logical contradiction, what path they please in reaching their results." (Adams) (1: 176-177)

Which brings us to the profound conclusion I think Bertrand Russell states beautifully; that "mathematics may be defined as the subject in which we never know what we are talking about, nor whether what we are saying is true." (1: 177)

Having arrived at this vague concept of what mathematics is, the topic implies the explanation of the term "modern" which is another impossibility. By "modern" do we mean today, this year, this decade, this century? When speaking in terms of math, it has been said that "modern" would include a period covering the last two or three hundred years. If this is the case, then the discussion of "modern math" would cover a vast array of topics which could probably fill dozens of textbooks.

Therefore, since it is unlikely that a definition of this topic can be discussed in a logical and precise manner, I would rather discuss what is entailed in the teaching of contemporary mathematics and which attitudes should be fostered. There is a certain feeling for mathematics which must be conveyed to the students of mathematics in order that they will be able to understand thoroughly what math is really all about and be able to apply their knowledge to the world of tomorrow. Professor Carl Raymond Hedrick vigorously supports the idea that the real values of mathematics reside in its processes. In his own words, he states that "if we allow our attention to centre on a special case, on a given fact, or on a particular skill . . . we shall be in danger of abandoning the process itself." (2: 454) It seems that today we have abandoned the emphasis on process - if there ever was one - and if "modern" curricular proposals do nothing more than redirect our attention to this most significant aspect of mathematics they will have made a tremendous contribution to mathematics education. In a report from the Netherlands, summarized by Professor John Kemeny of the International Congress of Mathematics meeting in Stockholm, 1962, there is a recommendation that "stress should be laid on thinking mathematically and more value attached to this ability than to knowledge

of a variety of less important facts." (2: 155) It has been said that "one of the great glories of mathematics is the possibility of moving its generalizations from the domain of probability into the domain of certainty within a given structure. It is this task to which we, as math teachers, have been called and at no time in the history of American education has the call been so inviting."

### Bibliography

1. Eves and Newson, An Introduction to the Foundations and Fundamental Concepts of Mathematics, New York, Holt, Rinehart and Winston, 1958.
2. Fawcett, Harold R., "Reflections of a Retiring Teacher of Mathematics", The Math Teacher, November, 1964.

### MCATA NEWS

#### 1. Membership

The Mathematics Council membership for the 1964-65 year rose to a record high of 567. This represents an increase of approximately 230 over the 1963-1964 year.

#### 2. President Attends Annual Meeting of NCTM

Len Pallesen of Calgary, our hard working president, was our delegate to the Forty-Third Annual Meeting of the National Council of Teachers of Mathematics held in Detroit, Michigan, April 21-24, 1965. On Thursday morning, Mr. Pallesen was presented with our certificate of affiliation with the NCTM.

Also attending this meeting were Mrs. Joan Kirkpatrick (Edmonton Public School Board), T.P. Atkinson, W.F. Coulson, and Dr. L.D. Nelson (University of Alberta, Edmonton).

#### 3. Mathematics Seminars

Two one-day mathematics seminars, sponsored by MCATA, were held