observations. They have little chance to analyze so that they might accept or reject a relationship. The opportunity to act as a mathematician is absent.

As far as the teaching of mathematics is concerned, one of these trends would permit the individual to develop as a skilled craftsman. The teacher would have a vast storehouse of knowledge which he would need to rely upon to keep the class moving in a correct fashion. For example, if a student wanted to solve quadratic equations, the teacher would know immediately whether or not this could be done with the knowledge possessed by the student. The teacher could then guide the student through the discovery of the various processes of solving this particular type of problem. Knowledge of his subject, then, is very important to the teacher who wants to follow the discovery approach used by the SMSG or the UICSM.

Programmed instruction would seem to leave very little for the teacher to do. When a student is unable to understand a specific point, the teacher could assist the student in mastering this concept. One other aspect of programming comes into play when a teacher builds a program of his own. During his labors, he becomes more intimately acquainted with the particular topic, with some of the problems involved in learning this topic, and with some of the problems involved in teaching this topic.

In this paper a brief look at two apparently divergent trends in mathematics education was attempted. Each teacher of mathematics must look more closely at each of these trends to see how they will or will not affect his teaching. It seems obvious that no teacher will remain untouched by these trends. Many people are advocating one or the other of these two approaches, people who are recognized as authorities in mathematics education. Perhaps it will be best for each teacher to conduct a little action research in his own classroom to help him decide. There can be no fence straddlers.

EFFECT OF THE STA PROGRAM ON DEVELOPMENT OF SKILL IN COMPUTATION, by T. P. Atkinson

Some of the questions which teachers and parents often ask about the

"Seeing Through Arithmetic" program being used in the elementary schools of Alberta are "Are computational skills being developed as well as formerly?" and "Does the program offer enough practice and drill in the mastery of the basic skills?"

Interested personnel of the Edmonton public schools have tried to answer such questions. In 1961 a survey test was administered to 3,500 Grade VII pupils and on the basis of results, norms were established. The test consisted of six sections:

5 minutes for adding of whole numbers
5 minutes for subtracting of whole numbers
5 minutes for multiplication of whole numbers
5 minutes for division of whole numbers
4 minutes for all four operations with common fraction numerals
4 minutes for all four operations with decimal fraction numerals

The number of items in each section was large enough so that none or very few pupils could do them all in the allotted time.

In September, 1964 the same test of six sections was administered to 4,000 Grade VII pupils, all of whom had received instruction for one or more years according to the STA program.

The data from these tests have not been analyzed completely as yet but a preliminary examination of them has led to a statement by Raymond Shaul, Supervisor of Junior High Schools for the Edmonton Public School Board. He says:

> In general, the introduction of the STA series in the elementary school has not adversely affected the elementary students in their mastery of basic computational skills as measured by the EPSB survey test administered in September, 1964 to all Grade VII students.

It is hoped that a statistical analysis of the data will be available soon. Mr. Shaul's statement - cautious as it is and should be - suggests that many fears and criticisms of teachers and parents that followed introduction of the STA program were unfounded.