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PREPARING TEACHERS FOR CURRICULUM CHANGE, by Eugene Wasylyk

Editor's Note - Mr. Wasylyk, vice-president of the Mathematics
Council and a member of the planning committee for the week-long
arithmetic seminar sponsored by the Council last July, makes this
report in retrospect.

In September of 1962, Alberta's elementary schools were given a new
program in arithmetic. The Department of Education authorized two
series of textbooks: Arithmetic We Need, published by Ginn and
Company, and Seeing Through Arithmetic, published by W. J. Gage.
The latter series is so different in emphasis and approach from
the previous authorization that many of the teachers who began
teaching it, particularly those whose professional training was
not very recent, soon encountered difficulty. Recognizing this
difficulty and anticipating that it would increase as the new
arithmetic program became established, the Mathematics Council of
The Alberta Teachers' Association undertook a seminar to familiarize
teachers with the concepts and teaching approach basic to the new

program. This seminar was held at Alberta College in Edmonton from July 3 to 10, 1962 and was attended by a total of 158 educators, mostly elementary teachers, but including also some junior and senior high school teachers, principals and superintendents.

The six-day seminar consisted of a two-hour general lecture session each morning, followed by a film and a two-hour group discussion and activity session each afternoon. Conducting the morning sessions was Merrill B. Hill, field editor in mathematics of Scott, Foresman and Company. His lectures, much enhanced by the use of an overhead projector, were of a general nature and dealt with the fundamental concepts of the new arithmetic. He was assisted by Ray Cleveland, the supervisor of mathematics, Rahway Public Schools, Rahway, New Jersey. The afternoon sessions dealt mainly with specific instructional topics and teaching procedures. In these sessions, each of the six groups into which the members were divided studied the textbooks and did actual problem work in the new arithmetic. Instructors in the afternoon sessions were N. M. Purvis and H. R. Ross of the Department of Education, and Mrs. G. J. Kirkpatrick, Mrs. M. Palmeter, Mrs. J. C. Oldham, and J. Kirkconnell of the Edmonton public school system.

The seminar was directed by J. M. Chernwichan, Salisbury High School. He was assisted by Mrs. Jean Martin, Ponoka Elementary School, and the writer (Thorhild High School). Instrumental in the planning stages of the seminar was the assistance given by T. P. Atkinson of Victoria Composite High School and M. T. Sillito, ATA executive assistant, chairman of the planning committee. Instructional materials, including textbooks, were supplied by W. J. Gage, who at the conclusion of the seminar donated the entire lot of materials to the Mathematics Council. Additional texts were supplied by the Edmonton Public School Board.

Participants were enthusiastic. Their cooperation and hard work seemed to indicate successful realization of the immediate objective of the seminar: to familiarize individual teachers with the concepts and teaching approach basic to the new arithmetic program. However, the seminar had a broader ultimate purpose: to prepare resource personnel who would direct inservice work in arithmetic at local and staff levels of the Association in an effort to help all arithmetic

teachers. (Representation at the seminar had been sought from each local organization of the Association and some locals even assumed the costs of the teacher or teachers representing them.) A survey has confirmed that in this second objective the seminar was more than moderately successful.

THE EXPERIMENTAL PROGRAM IN GRADE VII, by R. Plaxton

Editor's Note - Mr. Plaxton addressed one of the sessions of the Mathematics Council's annual conference, held in Edmonton on July 11, 12 and 13, 1962, about experiments with the new mathematics program. This item summarizes his talk.

The term "modern" does not mean that mathematics as we know it will be other than the backbone of the mathematic course in Grade VII for many years to come.

In 1960, a subcommittee was formed to study what changes should be made in the junior and senior high school mathematics programs in order to keep pace with the volume of new material available. Two committees were formed; one for the senior high and one for the junior high. After study of the junior high school text the subcommittee reported evidence of: (a) unsatisfactory relation of work with that of previous grades (b) repetitiveness (c) too great a stress on application, and (d) lack of "new" approaches and "new" concepts.

Choice by the committee of an experimental text was Seeing Through Mathematics because of its obvious content of new materials. Examination of differences between this program material and previous material shows emphasis on sets and subsets. Mathematicians believe this topic is one of the most unifying of all ideas in mathematics.

The "point set" approach is used in geometry: space being an infinite set of points - like a darkened room full of dust particles; a line would be a beam of light passing through it. A plane is a beam of light allowed through a door left slightly ajar. Closed curves are

a set of points dividing a plane into two regions. Class discussions on definitions arising out of these conceptions prompt discussions of great interest and value. Ideas of greater and lesser infinites arise. Other challenging ideas are posed and discussed. As to graphing, the concept of ordered pairs provides a unique and interesting approach.

Teacher questionnaires returned from 30 experimental classrooms led to the following conclusions:

1. The course took longer to teach than had been anticipated.
2. Classes showed more interest in this course than in usual ones.
3. There was a negative reaction to the geometry section which students found hard.
4. Concern was expressed by one-third of the respondents about difficulties encountered by slower students.
5. It was felt that additional training would have aided teachers in doing a better job.

In the coming year (1962-63) further experimentation will be carried out. Follow-up on the Seeing Through Mathematics series is being carried out in nine classrooms in 1962-63. Action research is being conducted on several other texts.

PROGRAMMED LEARNING, by J. A. McDonald

Editor's Note - Mr. McDonald, past president of the Association, spoke to the teachers at the Mathematics Council conference last summer on the topic of programmed instruction. A short summary of his remarks follows.

Teaching machines were conceived as early as 1873 for the purpose of teaching "logic". A tutoring machine employing defined procedures appeared in 1915 but was dropped as a research project in the thirties. Work was resumed on teaching machines in 1952 by Dr. B. F. Skinner. Development of the "reinforcement technique" on birds and animals formed the basis of Skinner's studies. N. A. Crowder had taught "logical trouble shooting" to American air force personnel. Dr. L. M.

Stolurow conceived programming as an art as opposed to a science. Many additional authorities have since pointed to valuable evidence for evaluating the techniques developed by these men.

The presentation of subject matter is by means of "frames" which present ideas in extremely small steps, easily understood. Correct responses receive confirmation and every effort is made to eliminate and minimize error. This is regarded as basic motivation. Accordingly, responses become the basis of progress, and cues practically ensure that these are correct. Confirmation of correct response reinforces the satisfaction obtained and provides further incentive. Error rates should not exceed 10 percent. These remarks apply particularly to linear type programs.

The branching type program stresses communication. Responses are selected from a number of choices. Incorrect responses require repetition of the program or the following of a substitute frame to the point of the error.

Programming (the art of writing frames in sequence, to obtain a particular objective) requires much practical testing so as to eliminate the possibility of error. Rewriting of sequences is time consuming, but very rewarding for teacher programmers, since they begin to understand how students really learn.

Teaching machines are used to present many types of programs. Since their basic purpose is to program particularly for one course, they are expensive compared to the cheaper forms of programming found in textbooks. Since no significant advantages have been demonstrated for the machine over the textbooks, most researchers use textbooks although the trend is toward machines because of their obvious advantages of presentation.

Both good and poor programs are available in an increasing range of subjects. Criteria for evaluation are included in the ATA monograph entitled Programmed Instruction. School districts have employed programs in widely varying amounts in assisting slow learners in adding material for accelerated students, and for improving grasp of difficult concepts. A great advantage is that the student can progress

through the material at his own rate. The Alberta Teachers' Associa-
tion has taken the lead in training personnel in this field. Dr. J.
D. Ayers and Executive Assistant M. T. Sillito attended an intensive
course organized by the Centre for Programmed Instruction, and seminars
for teachers were organized. More experimental work is needed, but
the evidence points to the possibility of increased use in Alberta
of this most important learning process.

1962 ANNUAL REPORT

Representatives of specialist councils attended a meeting of the
ATA Curriculum Committee in January, 1963, at which they presented
a report of the past year's activities. This is a portion of the
report made on behalf of the Mathematics Council.

Executive and Committees for 1962-63

Officers

President - Fred Tarlton, 7636 - 91 Avenue, Edmonton
Vice-President - Charles Tymchuk, 10642 - 61 Street, Edmonton
Past President - John Chernwichan, 276 Evergreen Street,
                    Sherwood Park
Secretary-Treasurer - Mrs. Jean Martin, Box 277, Ponoka

Committees

Executive Committee - The officers above plus the following ap-
pointed members: Representative of the Elementary Division: Mrs.
Ruby Lester, 1505 - 14 Avenue S., Lethbridge; Representative of
Junior High Division: E. Elkins, 2344 - 22 Street N. W. Calgary;
Representative of Senior High Division: Gordon Mack, 2528 Cherokee
Drive, Calgary; Faculty of Education: Professor W. F. Coulson,
University of Alberta, Edmonton; Department of Mathematics: Dr.
Wm. Bruce, University of Alberta, Edmonton; ATA Representative:
M. T. Sillito, Barnett House, Edmonton.

Book Review Editor - W. F. Coulson, University of Alberta, Edmonton.

Planning Committee for 1962 Seminar - T. P. Atkinson, Eugene Wasylyk, John Cherniwchan, and M. T. Sillito.

Planning Committee for 1963 Seminar - Charles Tymchuk, James Hrabi, and M. T. Sillito.

Activities

Publications - During the 1961-62 year, under the editorship of Mr. J. M. Cherniwchan and his assistant, Eugene Wasylyk, one bulletin (yearbook) and three newsletters were released. The Yearbook covered the addresses given by the speakers at the inaugural conference, remarks from the editor on the history of the council, and the names and addresses of the executive members. The Newsletters contained announcements, reports of experiments in curriculum, resumes of findings, comments on experiments with the STA series, book reviews, and lists of available mathematics books.

Conferences - The inaugural conference was held in Edmonton, August 16 - 19, 1961. The second annual conference was held in Edmonton, July 11 - 13, 1962. The third annual conference is being planned for Calgary on April 18 and 19, 1963.

Seminars - The MCATA held a seminar in Edmonton at Alberta College from July 3 - 10, 1962. This seminar was designed at the elementary level. There were 156 people in attendance and about 50 had to be turned away. Lecturers Merrill Hill and Ray Cleveland were made available by W. J. Gage, and six instructors, N. M. Purvis, H. R. Ross, J. Kirkconnell, Mrs. G. J. Kirkpatrick, Mrs. J. C. Oldham, and Mrs. M. Palmeter, were secured.

Questionnaires designed to assess the value of the July seminar were sent out to all seminar participants as well as superintendents of school systems. The returns are now in the hands of the committee. Although no summary has been made at this time, it seems evident that the seminar was very well received.

Regional Councils - One regional council, Central Alberta, was estab-
lished in 1962. The ground work was laid at the convention in Red
Deer in October. On October 27, a meeting was held in Red Deer and
a constitution was drawn up. On December 8, a very successful meet-
ing was held in Red Deer with Dr. S. A. Lindstedt as consultant for
the elementary section and James Hrabi as consultant for the junior-
senior high section. This Council has to date 46 members. Officers
are: H. L. Larson, Box 609, Ponoka, president; Vern King, Condor,
vice-president; H. J. Konschuh, Composite High School, Red Deer,
secretary-treasurer.

Other Activities - Mathematics symposia were held on November 6 and 7
in Edmonton and Calgary respectively under the sponsorship of the
MCATA. About 125 people were in attendance at each of these centres,
to hear Dr. M. Hartung, C. Olander, Dr. H. Trimble, Dr. R. Crouch,
and Dr. Van Engen present interesting and informative talks on recent
trends in mathematics.

THIRD ANNUAL CONFERENCE

Mathematics Council, ATA

at University of Alberta, Calgary

April 18 and 19, 1963

Prospective members welcome to join at this time and participate
in the conference. Membership fee $5. Contact Mrs. Jean Martin,
Box 277, Ponoka.

Editor - Professor W. F. Coulson, Faculty of Education, University of
Alberta, Edmonton