

Notes: Taken at the Regional Orientation Conference in Mathematics at Iowa City, Iowa, October 10 and 11, 1960.

Sponsor: The National Council of Teachers of Mathematics

Host: State University of Iowa

Regional Director: Dr. H. Vernon Price

Dr. H. Vernon Price, Professor of Mathematics at the State University of Iowa, opened the conference by introducing Dr. Harvey H. Davis, Provost of the State University of Iowa.

Dr. Davis officially welcomed the participants in the conference, emphasizing the important position of mathematics in the university program, as well as in the world of today.

Dr. G. Baley Price, Professor of Mathematics at the University of Kansas, gave an address: "Progress in Mathematics and Its Implications for the Secondary School". Some of the ideas presented by Dr. Price were:

The conference was arranged in order to give schools the opportunity to introduce new mathematics programs. He described changes in presenting mathematical materials so great today as to be called a revolution. Three causes of this revolution were:

1. Advances made in mathematics as a result of mathematical research.

Following is a list of topics that have come into being as important fields as a result of research.

- a. Abstract Algebra
- b. Topology
- c. Probability

- d. Theory of Games
 - e. Linear Program
 - f. Operations Research
 - g. Quality Control
2. Automation Revolution -- Introduction of machines that control machines.

Examples:

- a. Long distance telephone dialing
 - b. Automatic elevators
 - c. Launching guided missiles
 - d. Cutting three dimensional shapes out of materials.
3. Introduction of Large Scale Automatic Computing Machines. (Could be listed under "Automation Revolution")

Consequences of the revolution were:

1. Approximately 4000 Ph. D. mathematicians in the United States today, with about 3000 in colleges and universities and the other 1000 in industry.
2. The demands of society today for mathematicians are still not being met.

Three needs in high school today are:

1. Math courses with the proper mathematical context
2. Well qualified math teachers
3. Proper counseling

Four additional comments made by him were:

1. A small high school cannot normally provide the program and teachers needed -- it calls for more consolidation.

2. Many high school teachers need more training
3. Higher standards should be required of teachers of mathematics --
from elementary teachers on up
4. Teachers must re-examine techniques they are now using.

Dr. G. Baley Price closed by emphasizing that the mathematics taught in the elementary, junior high and high schools is vitally essential for the building of the mathematicians of today and tomorrow.

Monday afternoon, Dr. Kenneth Brown, Specialist in Mathematics, United States Office of Education, presented an address. He stated that we underestimate our students -- they can absorb much more mathematics than we give them. He told how Congressional Hearings showed the lack of balance in the high school curriculum today. Out of this came the N D E A and more emphasis on math. Changes need to be made in our math programs. These recommended changes do not ask for more time -- but improved use of time. Dr. Brown discussed the following projects:

School Mathematics Study Group (SMSG), Drawer 2502 A, Yale Station,
New Haven, Conn. -- Professor E. G. Begle, Director.

University of Illinois Committee on School Mathematics (UICSM), University of Illinois, Urbana, Ill. -- Dr. Max Beberman, Director.

University of Maryland Mathematics Project, 1515 Massachusetts Ave.,
N. W., Washington 5. -- Dr. John R. Mayor, Director.

Boston College Mathematics Series, Chestnut Hill 67, Mass. -- Rev.
Stanley Bezuska, S. J., Director.

Ball State Teachers College Experimental Program. Ball State Teachers College, Muncie, Ind. -- Dr. Charles Brumfiel, Director.

Developmental Project in Secondary Mathematics, Southern Illinois University, Carbondale, Ill. -- Morton R. Kenner, Director.

Commission on Mathematics, College Entrance Examination Board, 425 West 117 St., New York 27, N. Y. -- Julius H. Klavaty, Director.

N. C. T. M. Secondary School Curriculum Committee, National Council of Teachers of Mathematics, 1201 16 St., N. W., Washington 6.

These projects, along with others, are discussed briefly in "Aids for Mathematics Education: Mathematics -- A Universal Language of Modern Civilization"; OE - 29013, a bulletin from the U. S. Department of Health, Education and Welfare -- Office of Education -- Washington 25, D. C. These projects called for much work by the teachers, but they liked it.

"Buzz" sessions were held following the talk by Dr. Brown to determine questions to be discussed by the panel Tuesday morning.

Monday evening four high school teachers discussed their experiences with the new programs in mathematics carried on in their schools. A few of the ideas brought out by these teachers follow:

University of Illinois Program (UICSM) Miss Grace Wandke
Barrington Consolidated High School
Barrington, Illinois

The two basic ideas for the UICSM program are (1) the development and perfection of a new curriculum in mathematics and (2) the dissemination of this information to the high schools.

Miss Wandke stated that:

1. This is not a program for the "8:30 to 4:30" teacher -- It demands extra expenditures of time and effort.
2. She recommends the program -- she does not know that it is the best but it is a good program.
3. The Barrington teachers and community like the program.

University of Maryland Program (UMMaP) Mrs. Ruth Brown
McKinstry Jr. High School
Waterloo, Iowa

The UMMaP thus far has been a 7th and 8th grade project, with emphasis upon the structure of mathematics. Precise language is important.

Published materials on the UMMaP may be purchased from Dr. John R. Mayor, University of Maryland, College Park, Maryland.

The students wrote that they enjoyed the "new approach to mathematics."
They were not bored.

Ball State Program -- Mr. Wilson Banks
Pleasant Valley -- Riverdale High School
Bettendorf, Iowa

This program has been used in the 7th, 8th and 9th grades, primarily with average students.

There has been no extra training for teachers.

There is an article in the February, 1960 issue of the Mathematics Teacher about the Ball State Program.

The 9th grade algebra and the 10th grade geometry courses have been published by the:

Addison - Wesley Publishing Company

School Mathematics Study Group Program Miss Joan Tanzer
Mechanical Arts High School
St. Paul, Minnesota

Miss Tanzer teaches the program at the 11th grade level.

Mathematics is founded on the principles of logic, emphasizing reasoning rather than memorization.

The program seeks enrichment, not acceleration.

Teachers attend a special institute to prepare them for teaching the program.

Tuesday morning Dr. W. Eugene Ferguson, head of the mathematics department at Newton High School, Newtonville, Massachusetts, listed eight basic steps for implementing a new mathematics program for secondary schools:

1. Recognition by the school authorities of the need for a new mathematics program.
2. Adequate preparation of teachers in the mathematics that is now being taught for the first time in secondary schools.
3. Selection of a new program.
4. Selection of students for the program.
5. Informing parents about the new program.
6. Informing other members of the school system about the new program and its implications for the mathematics

program Kindergarten through Grade 12.

7. Continuation of teacher preparation for carrying the new program to higher grades and also lower grades.
8. Provision for adequate time and compensation for carrying on the new program year after year.

He suggested that all college bound students would profit from the program -- although the teachers would be more comfortable the first time through with students in the upper 25% of the class. There should be a consultant available to help the teachers.

All teachers of math in the school system should know the new program of math, whether they are teaching it or not.

Although it is too early to draw conclusions statistically sound about the new math program; it has been observed that students hold their own in the traditional tests, and also have a new found knowledge learned in the program.

Teachers quite often have more trouble shifting to the new program than do the students -- they have to unlearn an old approach.

After the panel consisting of Dr. G. Baley Price, Dr. Brown, Dr. Ferguson and Mr. Frank B. Allen, head of the department of math at Lyons Township High School and Junior College at La Grange, Illinois answered questions from the audience, Mr. Allen summarized the conference.

The National Council of Teachers of Mathematics does not single out any one program -- but submits all programs for consideration.

The administrator's role should be to show interest, interpret the new program to the public, encourage his staff, and provide inservice training. The teacher's role should include making mathematics fun for the student. The student's role should be to become curious again, to become less concerned with techniques and more concerned with the reason "why", but not to neglect techniques.

Mr. Allen closed by emphasizing that the new approach to mathematics is sound, that it is not a fad, and that its benefits will be far reaching.