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Mathematics newsletters as professional aids to teachers

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Thesis

MATHEMATICS NEWSLETTERS

AS PROFESSIONAL AIDS TO TEACHERS

by

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CHAPTER I

Introduction

Statement of the problem - The problem upon which
this study is based is that of analyzing and tabulating the
essential features of mathematics newsletters. Three basic
features of these mathematics publications constitute the
crux of the problem. These features are:

1. Purposes of the newsletter
2. Content
3. Publication of the newsletter

The newsletters, then, both individually and as a group are
to be studied in an attempt to determine what their functions
are, what they contain, and how they are published. Three
viewpoints will be taken into account -- those of the editors
of the publications, the readers' reactions, and the writer's
analysis of sample issues of the several newsletters.

Purpose of this study - It is commonly agreed upon in
the field of education that professional growth is a vital
factor in the development of successful and conscientious
teachers.[1] In the area of the teaching of mathematics the

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[1]Knudsen, Charles W., and Lucius O. McAfee, An Introduc-
tion to Teaching, New York: Doubleday, Doran, and Company,
Inc., 1936, pp. 306-322.

publications sponsored by the several state and regional teachers associations are a part of this effort to stimulate individual and group improvement. It is the intent of this study to appraise these publications as professional aids to teachers.

The major objective of this study, the appraisal of mathematics newsletters, may be conveniently described as consisting of two sub-purposes. The first is that of presenting in some detail a description of the mathematics newsletters now being published in order that those interested in these publications may gain a clear picture of what is being done throughout the country. The second purpose is to make known the attitudes, criticisms, suggestions, and desires of editors and teachers alike in relation to mathematics newsletters as professional aids.

It is hoped that the results of this survey may serve as a basis for an objective evaluation by the various state associations as to the strengths and limitations of their newsletters. In this way, perhaps, more effective and popular publications may result, and a contribution to better teaching will have been made.

Justification - There are, at present, in this country more than twenty associations of teachers of mathematics which publish some form of mathematics newsletter or bulletin as part of their professional activities. In many of these associations the newsletter is the major, if not the sole,

means of communication. Therefore, if for no other reason than that of providing a channel for the dissemination of association news the newsletter may be considered an integral part of the organization. It is evident that if a newsletter is to achieve maximum effectiveness considerable attention must be given to the purposes, content, and method of presentation of the publication. It is precisely these three functions which prompt the undertaking of this study.

While the various mathematics associations are at times confronted with problems peculiar to a particular group, generally speaking all groups share the same basic objectives, interests, and difficulties. A sharing of information and a comparison of methods of operation would accordingly be of value in seeking to build effective newsletters and worthwhile associations.[1]   As will be mentioned in the next chapter, however, there does not appear to be any single survey or combination of surveys fully treating the topic of mathematics newsletters. This absence of pertinent information compiled under a single heading is felt to be sufficient justification for the study under consideration. From the interest and encouragement expressed by a number of readers and especially editors of mathematics newsletters in regard to this survey there is good indication that a project of

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[1]Mayor, John R., "Newsletters of the Affiliated Groups," The Mathematics Teacher, 45: 247, April, 1952.

this type is desirable.

   Scope of the problem - Because the project under dis-
cussion is to a large degree an exploratory one there are
several limitations which have had to be accepted and which
should be clearly understood. In keeping with the purposes
of this study primary emphasis has been given to a simple
description and enumeration of the more important aspects of
publishing newsletters. While personal opinions and subjec-
tive attitudes have been solicited, no evaluations or ratings
have been attempted. Forthright quantitative material is
presented without special concern for qualitative judgments
or conclusions. It is beyond the scope of this survey to
determine what newsletters are better than others or to even
presume what factors contribute to the making of an outstand-
ing publication. The data presented herein are merely
expressions of what exists in the area of mathematics news-
letters.

   The reader is free to draw his own inferences as to
whether any single newsletter or the entire group is making
a satisfactory contribution to the professional growth of
mathematics teachers. Those concerned with the editing and
publication of a newsletter will perhaps find the data of
value in assessing their methods and procedures.

   Another limitation which should be explained is the type
of publication considered under the heading of newsletter or

bulletin. Annual reports, special notices, student publications (including those published by teachers groups but directed to student readers), and informal correspondence have all been excluded from this survey. Only regularly scheduled publications of local, state, or regional associations which are part of the associations' professional programs are to be included in this problem.

A further point to be noted is that only newsletters which were currently being published and copies of which were obtainable at the time of this study contributed to the data. No information or comments were accepted from groups which had previously sponsored or were planning to sponsor a newsletter or bulletin. This stipulation confines the study to conditions as found at the time of the project.

CHAPTER II

Summary of Literature

In various areas of study and research one often encounters somewhat of a paradox in that certain topics or activities receive considerable attention in the form of experiments, surveys, criticisms, or analyses, yet other points of equal interest and importance are to a large degree neglected. Just such a situation exists in the area of the teaching of mathematics. Mathematics newsletters, which by their very existence and number occupy no minor station in the affairs of mathematics teachers, appear to have gained little attention in the literature. Except for occasional mention in The Mathematics Teacher apparently no reference has been made to mathematical newsletters as such in published form. A number of writings on trade journals and house organs in general, however, contain material pertinent to this topic, and accordingly mention of these writings will be made below.

A. Values and Purposes

Donovan A. Johnson, writing of affiliated group activities in The Mathematics Teacher,[1] refers to newsletters as

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[1] Johnson, Donovan A., "Newsletter for Mathematics Teachers", The Mathematics Teacher, 46:99, February, 1953.

effective means of building teacher organizations and of being of service to individual members. Dr. Johnson also suggests that local publications of limited circulation are more apt to encourage contributions from classroom teachers than would more widely circulated journals. Accordingly, not only will more widespread interest and participation be stimulated, but no single individual or group will be burdened with the entire task of publishing the newsletter.

In the book Business Paper Writing - A Career by Pauline and Wilfrid Redmond[1] a comment concerning the purposes of business journals applies equally well to the objectives of newsletters for mathematics teachers. The authors state that if the professional people "who are really doing things," who possess workable ideas would attempt to have their suggestions and comments printed, the published material would be of true value to everybody concerned.

Peter O'Shea, an early authority on the subject of employee publications, in his book Employees' Magazines[2] suggests five opportunities or values associated with house organs: acquaintance, cooperation, unity, morale and education. The implications and applications of these objectives to organizations of teachers follow immediately. As O'Shea

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[1]Redmond, Pauline and Wilfrid, Business Paper Writing - A Career, New York: Pitman Publishing Corp., 1939, p. 53.

[2]O'Shea, Peter F., Employees Magazines, New York: H. W. Wilson Co., 1920, p. 13.

remarks, "Cooperation must have a necessary basis in acquaintance with complementary processes."[1] The inter-action of the activities of personnel from different areas of operation through the medium of an organizational bulletin leads to the visualization of unity in the minds of the entire group.

B. Content

Johnson, in his article on newsletters for mathematics teachers indicates that the content of the newsletters varies considerably.[2] He lists fifteen types of articles as typical of those frequently found in the newsletters:

Announcements of conferences and meetings for mathematics teachers.

Organizational information such as memberships, officers, committees, constitutions, meeting minutes, reports and elections.

Articles on mathematics teaching.

News notes about local teachers and schools.

Summaries of talks presented at conferences.

Application forms for membership in the state organization and the National Council.

Editorials.

Greetings from the president.

Announcement of materials of instruction.

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[1] Ibid, p. 3.

[2] Johnson, op. cit., p. 99.

Unusual sidelights, problems, recreations, quotations
of a mathematical nature.

Reports of current teaching practices.

Committee reports.

Book reports.

Projects for the mathematics laboratory.

Announcements of workshops and summer school courses.
This list of the various types of articles likely to be
found in mathematics newsletters is composed, essentially,
of three major categories - one relating to the activities
of the sponsoring organization, one containing articles of
technical interest to mathematics teachers, and one including
articles of personal interest and enjoyment.

The classification of articles or stories of a publica-
tion need not be limited to the use of subject matter as the
sole criterion, however. The Redmonds, for example, would
utilize the length of an article as a basis for sub-dividing
feature stories into four classes.[1] They define special
features as containing up to two thousand words while straight
features run to seven hundred or eight hundred words as a
rule. Articles of from three hundred to six hundred words
would be classified as featurettes, and those under two hun-
dred and fifty would be called short features. O'Shea lists
five criteria for suitable articles of a house organ.[2] They are:

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[1]Redmond, op. cit., p. 16.

[2]O'Shea, op. cit., p. 9.

1) Write everything from the readers' point of view.

2) Make everything readable.

3) Make everything constructive.

4) Make everything personal.

5) Print nothing which does not affect or directly relate to the particular group concerned.

O'Shea summarizes his attitude on content with this statement, "You can't follow the employee into his home and stand over him with a club until he conquers a long, dry article which would be good for him -- like a pill. The paper must carry inside itself the attraction which will draw him through it."[1]

C. Methods of Production

John R. Mayor in his article "Newsletters of the Affiliated Groups" states that "Most of the affiliated groups bulletins are mimeographed. They vary in size from two pages to ten. The usual number of issues per school year is four but there is some variation from this. Three of the better known of these publications have appeared as printed publications for some time. These are from Kansas, California, and New Jersey."[2]

Donovan Johnson attributes much of the success of teacher organizations to the development of efficient means of reproduction which make possible the duplication of material

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[1] O'Shea, op. cit., p. 10.

[2] Mayor, John R., "Newsletters of the Affiliated Groups", The Mathematics Teacher, 45:247, April, 1952.

quickly and at low cost.[1] Most of the publications of

mathematics teacher organizations, on both the state and

local level, are mimeographed he adds. Johnson indicates

the following advantages and virtues of this type of reproduc-

tion:

> Production time is relatively short since galley proofs,
> cuts, and printing schedules are not involved.
>
> Mimeographing is a flexible means of reproduction in
> that drawings, symbols, or irregular printing may
> be readily cut on the stencils.
>
> Expense is kept to a minimum through use of mimeographed
> forms, and cost is limited for the most part to
> stencils, paper and postage. Many of the minor
> considerations in the process can be readily cared
> for through school facilities and student help.

In planning for the production of a publication such as

a newsletter or bulletin a number of basic factors must be

considered. Melcher and Larrick, in their authoritative

Printing and Promotion Handbook[2], mention four such factors.

They are:

1) Space allocation -- size, number of pages.

2) Kinds of illustration, if any -- photograph, cartoon,
   pictograph, line drawing.

3) Use of color, if any.

4) Printing process -- which ones are within budgeting
   limits.

The myriad other details which must necessarily be

attended to in the production process include such items as

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[1]Johnson, op. cit., p. 99.

[2]Melcher, Daniel and Larrick, Nancy, Printing and Promo-
tion Handbook, New York: McGraw-Hill Book Co., Inc., 1949,
p. 82.

kind of paper, column arrangement, margins, placing heads, and kind of type. More specific attention will be given these topics in the next chapter.

CHAPTER III

Analysis of Newsletters

While those actively engaged in the preparation of mathematics newsletters or bulletins may be familiar with the variety of publications to be found in this field, other individuals interested in newsletters may be acquainted with only one or two journals. That a variety of styles does indeed exist among the newsletters may best be seen from an actual examination of the publications themselves. To this end, the twenty newsletters available for this survey were studied by the writer, and the remainder of this chapter contains the data obtained.

Procedure - Each of the twenty newsletters was examined according to the procedure outlined below. For some of the newsletters as many as eight different issues were available while for others only a single issue was obtained for study. In cases where a number of issues were on hand, only those of the past year were analyzed, whereas if fewer than a year's quota were obtained whatever issues were available were studied.

In analyzing the newsletters two basic features were considered -- first, the physical appearance and makeup of the publications, and second, the actual content of the

newsletters. Included in the first category are six sub-topics:

1. Dimensions of the publication

2. Number of pages

3. Type of cover

4. Use of color in the publication

5. Method of printing

6. Column arrangement

Under the heading of content are three topics:

1. Use of illustrations, photographs, drawings, etc.

2. Types of articles

3. Amount of space devoted to each type of article

Each of the newsletters was examined on the basis of the nine topics mentioned. The particular points considered under each topic are described below, and the analyses of the newsletters themselves follow the explanation of the topics. Summaries of the data obtained follow the analyses of the newsletters.

Dimensions - The dimensions given are for the overall width and length of the publications. The width is listed first and the length second.

Number of pages - A page, in this survey, is considered to be one side of a sheet of paper. A sheet printed on both sides is therefore counted as two pages. In addition to the number of pages contained in the newsletters,

it is stated whether or not each newsletter is published with printing on one side of the paper only or on both sides.

Type of cover - If a cover is used with the newsletter it is described briefly, and if no cover is utilized, the front page and masthead are mentioned in place of the cover.

Use of color - If colors other than black and white are used, mention is made of the kind of color and the manner in which it is employed.

Method of printing - All of the newsletters examined may conveniently be said to be printed by one of three processes -- offset, letterpress, or stencil. Included in this last classification are mimeographing, multigraphing, or any other duplicating process utilizing stencils. Each newsletter, therefore, is listed as being printed by offset, letterpress, or stencil.

Column arrangement -- Some of the newsletters were found to use two columns of type to a page while others made use of three or, in some cases, only one column. The column arrangement utilized by each individual newsletter is indicated as part of the physical description.

Use of illustrations - If drawings, photographs, diagrams or other illustrations were found in a newsletter, mention is made of each type used. Drawings used as part of the masthead are considered under the topic of covers and

are therefore not included as part of the illustration category.

Types of articles - Every article of each newsletter was read and classified according to its content. No list of headings was prepared prior to the actual study of the newsletters since it would obviously be difficult to foresee all the various types of articles to be found. Each article was allowed, through its content, to suggest its own classification. Editorials, announcements of workshop and conferences, and methods of teaching are typical of the content headings used.

Amount of space - Following each type of article listed per newsletter the percentage of the total newsletter space occupied by this type of article is also given. The unit used as a basis for determining the length of articles was an inch of column space.

Bulletin of the Arkansas

Council of Teachers of Mathematics

Dimensions	-	6 x 9 inches
Number of pages	-	4 - Printing on both sides of sheet.
Cover	-	No separate cover. Masthead and names of state officers included on front page.
Color	-	No color used.
Printing	-	Offset
Column arrangement	-	Single column on front page, two columns per page elsewhere.
Illustrations	-	None

Types of articles and amount of space -

Methods of teaching	48%
News of the sponsoring organization	26
Problems and puzzles	8
News on workshops and conferences	6
Editorials	6
Poems and jokes	4
Teaching aids or devices	1
Book reviews	1

California Mathematics Council

Bulletin

Dimensions	-	6 x 9 inches
Number of pages	-	20 - Printing on both sides of sheet.
Cover	-	Stiff paper cover on front and back. Masthead, table of contents, and conference dates appear on front cover. Association officers are listed on inside front cover.
Color	-	Covers are of bright, solid colors. A different color is used for each issue.
Printing	-	Letterpress
Column arrangement	-	Single and double column arrangements used alternately according to type of material being presented.
Illustrations	-	Line drawings and geometric figures are used occasionally.

Types of articles and amount of space -

Curriculum suggestions	25%
News of sponsoring organization	23
Methods of teaching	16
Training of teachers	10
National Council news	10
Highlights in literature	8
Student Activities	5
News of workshops and conferences	3

Colorado Council of Teachers

of Mathematics

The Encompasser

Dimensions   - $8\frac{1}{2}$ x 11 inches

Number of pages   -   12 - Printing on one side of sheet only.

Cover   -   First page serves as cover. Masthead
and table of contents constitute
first page.

Color   -   Each issue published using different
colored paper. The entire publica-
tion is printed on the colored paper.

Printing   -   Stencil

Column arrangement   -   Two columns per page except for first
page which has a single column.

Illustrations   -   Only an occasional diagram.

Types of articles and amount of space   -

News of sponsoring organization	37%
Curriculum suggestions	12
National Council news	10
Applied mathematics	10
News of workshops and conferences	9
Foreign education	7
Book reviews	4
Editorials	4
Suggestions on writing math. articles	3
Notes on individual schools or teachers	2
Poems and jokes	1
Methods of teaching	1

Illinois Council of Teachers

of Mathematics

Newsletter

Dimensions	-	$8\frac{1}{2}$ x 11 inches
Number of pages	-	6 - Printing on both sides of sheet.
Cover	-	No cover used. Masthead appears at top of first page.
Color	-	Masthead is in bright red ink.
Printing	-	Stencil
Column arrangement	-	Two columns per page.
Illustrations	-	Limited to an occasional geometric figure or diagram.

Types of articles and amount of space -

News of sponsoring organization	32%
Elementary education	21
Methods of teaching	9
Teaching aids or devices	8
Mathematics publications	6
News of workshop and conferences	6
Special topics in mathematics	5
Mathematics in the news	4
Student activities	3
Educational research	3
Problems and puzzles	2
National Council news	1

Indiana Mathematics Newsletter

Dimensions	–	8½ x 11 inches
Number of pages	–	8 – Printing on both sides of sheet.
Cover	–	No cover. Masthead appears on front page.
Color	–	No color, but large, black type is used for headings and titles.
Printing	–	Offset
Column arrangement	–	Generally two columns per page, but three columns used occasionally.
Illustrations	–	Each issue has a photograph approximately 3 x 5 inches on front page. Illustrated column headings are also used on occasion.

Types of articles and amount of space –

News of sponsoring organization	23%
National Council news	11
Teaching methods	11
Curriculum suggestions	10
Notes of individual schools or teachers	10
Mathematics in the news	10
Student activities	5
Teaching aids or devices	5
Editorials	4
News of workshops and conferences	3
Education in general	3
Problems and puzzles	3
Training of teachers	1
Poems and jokes	1

Iowa Association of Mathematics Teachers

Mathematics Newsletter

Dimensions   - $8\frac{1}{2}$ x 11 inches

Number of pages   -   4 - Printing on one side of sheet
                           only.

Cover   -   No cover. Masthead and list of
                           association officers appear at top
                           of first page.

Color   -   No color used.

Printing   -   Stencil

Column arrangement   -   One column per page.

Illustrations   -   None

Types of articles and amount of space -

        Teaching aids or devices   36%
        National Council news   21
        News of workshops and conferences   18
        Methods of teaching   14
        News of sponsoring organization   11

Bulletin of the Kansas Association

of Teachers of Mathematics

Dimensions   -   6 x 9 inches

Number of pages   -   8 - Printing on both sides of sheet.

Cover   -   First page serves as cover. Masthead,

                        table of contents, and list of

                        association officers are contained

                        on first page.

Color   -   No color used.

Printing   -   Offset

Column arrangement -   Two columns per page.

Illustrations   -   None

Types of articles and amount of space -

            News of sponsoring organization   28%
            Mathematics in college   19
            Curriculum suggestions   14
            Educational research   10
            Education in general   6
            Training of teachers   5
            Applied mathematics   4
            Teaching aids, devices   4
            Mathematics in the news   3
            National Council news   2
            Special topics in mathematics   2
            Mathematics in the literature   2
            News of individual schools or teachers 1

Minnesota Mathematics

Newsletter

Dimensions	-	8½ x 11 inches
Number of pages	-	12 - Printing on both sides of sheet.
Cover	-	No separate cover. Front page with masthead serves as cover.
Color	-	Masthead appears in bright red. Color not used otherwise.
Printing	-	Stencil
Column arrangement	-	Two columns per page except for special articles printed as a single column.
Illustrations	-	Several diagrams per issue.

Types of articles and amount of space -

News of sponsoring organization	20%
Teaching aids or devices	19
Student activities	11
Problems and puzzles	9
Methods of teaching	8
Curriculum suggestions	7
Educational research	7
News of individual schools or teachers	6
Editorials	5
News of workshops and conferences	3
National Council news	2
Mathematics in the news	2
Training of teachers	1

Missouri Newsletter

Dimensions — $8\frac{1}{2}$ x 11 inches

Number of pages — 8 - Printing on both sides of sheet.

Cover — No cover. Masthead appears at top of first page.

Color — Masthead is in bright red color. Color is not used elsewhere.

Printing — Stencil

Column arrangement — Two columns per page.

Illustrations — Only in special articles such as mathematics tests where diagrams or figures are used.

Types of articles and amount of space —

News of sponsoring organization	20%
Mathematics tests	23
National Council news	18
Methods of teaching	8
Book reviews	8
Education in general	6
News of teachers' groups	4
Notes on individual schools or teachers	3
Mathematics publications	3
Curriculum suggestions	3
News of workshops and conferences	3
Poems	1

Association of Teachers of Mathematics

in New England

Newsletter

Dimensions	-	$8\frac{1}{2}$ x 11 inches
Number of pages	-	5 - Printing on one side of sheet only.
Cover	-	No cover. Masthead and list of association officers on first page.
Color	-	None
Printing	-	Stencil
Column arrangement	-	Two columns per page.
Illustrations	-	None

Types of articles and amount of space -

News of sponsoring organization	43%
Special topics in mathematics	17
Poems and jokes	16
Curriculum suggestions	6
Notes on individual schools and teachers	5
News of workshops and conferences	5
National Council news	5
Methods of teaching	3

The New Jersey Mathematics Teacher

Dimensions	-	5½ x 8 inches
Number of pages	-	32 - Printing on both sides of sheet.
Cover	-	Covers on front and back. Masthead and table of contents on front cover. Association officers listed on inside of front cover.
Color	-	Gray shading used on front cover. No other color used.
Printing	-	Offset
Column arrangement	-	Single column per page.
Illustrations	-	Numerous diagrams, figures, and graphs used throughout the bulletin.

Types of articles and amount of space -

Special topics in mathematics	37%
News of sponsoring organization	22
Methods of teaching	15
Curriculum suggestions	13
Mathematics publications	9
Book reviews	4

Association of Mathematics Teachers

of New York State

Newsletter

Dimensions   -   7 x 9 inches

Number of pages   -   8 - Printing on both sides of sheet.

Cover   -   No cover. Masthead appears at top

                        of first page.

Color   -   No color used. Heavy, black type

                        used for headings.

Printing   -   Letterpress

Column arrangement -   Two columns per page.

Illustrations   -   Diagrams used occasionally for

                        special articles.

Types of articles and amount of space -

News of sponsoring organization	18%
Special topics in mathematics	16
Curriculum suggestions	10
Problem solving	8
Methods of teaching	7
Student activities	7
Teaching aids or devices	7
Mathematics in general	5
Educational research	5
History of mathematics	4
Problems or puzzles	3
Testing in mathematics	3
Elementary school mathematics	3
Training of teachers	2
National Council news	1
Teachers' comments	1

Ohio Council of Teachers of Mathematics

Newsletter

Dimensions   - $8\frac{1}{2}$ x 11 inches

Number of pages   -   6 - Printing on both sides of sheet.

Cover   -   No cover. Masthead appears at top

                             of first page.

Color   -   No color used.

Printing   -   Stencil

Column arrangement   -   One column per page.

Illustrations   -   None

Types of articles and amount of space -

          News of sponsoring organization   57%
          National Council news   27
          Workshops and conferences   6
          Mathematics publications   6
          Notes on individual schools or teachers 4

Oregon Mathematics Newsletter

Dimensions	-	8½ x 11 inches
Number of pages	-	4 - Printing on both sides of sheet.
Cover	-	No cover. Masthead at top of first page.
Color	-	No color used.
Printing	-	Offset
Column arrangement	-	Two columns per page.
Illustrations	-	Generally one or two photographs, 2 x 3 inches, of teachers or association officers. Geometric figures or diagrams also used occasionally.

Types of articles and amount of space -

Problems and puzzles	28%
News of sponsoring organization	25
Editorials	7
Teaching aids or devices	7
Student activities	6
Special topics in mathematics	6
Notes on individual schools or teachers	5
History of mathematics	4
Mathematics in general	3
News of workshops and conferences	3
National Council news	2
Practical mathematics	2
Mathematics publications	2

Pennsylvania Council of

Teachers of Mathematics

Dimensions	-	$8\frac{1}{2}$ x 14 inches
Number of pages	-	8 - Printing on both sides of sheet.
Cover	-	None. Masthead at top of first page.
Color	-	No color used.
Printing	-	Stencil
Column arrangement	-	Single column throughout.
Illustrations	-	None

Types of articles and amount of space -

News of sponsoring organization   95%
News of individual schools or teachers   5

Association of Teachers of Mathematics

of Philadelphia and Vicinity

Newsletter

Dimensions   -   8½ x 11 inches

Number of pages   -   3 - Printing on one side of sheet

                           only.

Cover   -   No cover. Masthead at top of first

                           page.

Color   -   No color used.

Printing   -   Stencil

Column arrangement   -   Single column throughout.

Illustrations   -   None.

Types of articles and amount of space -

            News of sponsoring organization   73%
            National Council news   17
            News of workshops and conferences   5
            Mathematics publications   4
            Puzzles   1

Mathematics Teachers Association

of Western Pennsylvania

Newsletter

Dimensions   -   8½ x 14 inches

Number of pages   -   4 - Printing on one side of sheet
                           only.

Cover   -   No cover. Masthead and list of state
                           officers appear at top of first page.

Color   -   No color used.

Printing   -   Stencil

Column arrangement   -   Single column throughout.

Illustrations   -   None

Types of articles and amount of space -

        News of sponsoring organization   53%
        Notes on individual schools and teachers 25
        Poems and puzzles   12
        News of workshops and conferences   9
        Student Activities   1

Texas Council of

Mathematics Teachers

Newsletter

Dimensions	-	$8\frac{1}{2}$ x 11 inches
Number of pages	-	12 - Printing on both sides of sheet.
Cover	-	None - Masthead at top of first page.
Color	-	None used.
Printing	-	Stencil
Column arrangement	-	Two columns throughout except for special articles appearing in single column form.
Illustrations	-	Diagrams or drawings used as needed.

Types of articles and amount of space -

News of sponsoring organization	25%
Mathematics in general	15
Methods of teaching	10
Elementary school mathematics	9
News of workshops and conferences	7
National Council news	5
Teaching aids, devices	5
Curriculum suggestions	5
Poems and quotations	5
Mathematics in industry	4
Problems and puzzles	4
News of individual schools or teachers	3
Mathematics publications	2
Student activities	1

Utah Council of

Teachers of Mathematics

Newsletter

Dimensions   —   8½ x 11 inches

Number of pages   —   2 - Printing on one side of sheet

only.

Cover   —   None. Masthead at top of first page.

Color   —   None used.

Printing   —   Stencil

Column arrangement   —   Single column per page.

Illustrations   —   None.

Types of articles and amount of space —

News of sponsoring organization   60%
Curriculum suggestions   11
News of individual schools and teachers 11
Teaching aids or devices   7
Mathematics in general   7
National Council news   4

Wisconsin Teacher of Mathematics

Dimensions — $8\frac{1}{2}$ x 11 inches

Number of pages — 14 - Printing on both sides of sheet.

Cover — Heavy paper used for front and back covers. Front cover also serves as first page and includes masthead at top.

Color — Colored paper used for covers. No other color used.

Printing — Stencil

Column arrangement — Two columns per page.

Illustrations — Geometric figures used occasionally.

Types of articles and amount of space —

Methods of teaching	34%
News of sponsoring organization	15
Curriculum suggestions	13
News of workshops and conferences	8
National Council news	8
History of mathematics	7
News of individual schools or teachers	4
Mathematics publications	3
Teaching aids or devices	2
Puzzles and jokes	2
Student activities	2
Training of teachers	1
Mathematics tests	1

Key to Table 1

Dimen.	-	Dimensions in inches
No. Pp.	-	Number of pages
Col.	-	Number of columns per page
Cov.	-	Cover
Illust.	-	Illustrations
Print.	-	Method of printing
Y	-	Yes
N	-	No
O	-	Offset
L	-	Letterpress
S	-	Stencil

TABLE 1

SUMMARY OF PHYSICAL CHARACTERISTICS
OF NEWSLETTERS

Newsletter	Dimen.	No. Pg.	Col.	Cov.	Color	Illust.	Print.
Arkansas	6x9	4	2	N	N	N	O
California	6x9	20	1,2	Y	Y	Y	L
Colorado	8½x11	12	2	N	Y	Y	S
Illinois	8½x11	6	2	N	Y	Y	S
Indiana	8½x11	8	2	N	N	Y	O
Iowa	8½x11	4	1	N	N	N	S
Kansas	6x9	8	2	Y	N	N	O
Minnesota	8½x11	12	2	N	Y	Y	S
Missouri	8½x11	8	2	N	Y	Y	S
New England	8½x11	5	2	N	N	N	S
New Jersey	5½x8	32	1	Y	N	Y	O
New York	7x9	8	2	N	N	Y	L
Ohio	8½x11	6	1	N	N	N	S
Oregon	8½x11	4	2	N	N	Y	O
Pennsylvania	8½x14	8	1	N	N	N	S
Philadelphia	8½x11	3	1	N	N	N	S
West. Penna.	8½x14	4	1	N	N	N	S
Texas	8½x11	12	2	N	N	Y	S
Utah	8½x11	2	1	N	N	N	S
Wisconsin	8½x11	14	2	Y	Y	Y	S

Key to Table 2

NI - Number of issues of newsletter examined.

AM - Applied or practical mathematics.

CS - Curriculum suggestions.

E - Editorials

EE - Elementary school mathematics.

EG - Education in general.

ER - Educational research.

HM - History of mathematics.

IS - News of individual schools or teachers.

MG - Mathematics in general.

ML - Mathematics in the literature and publications.

MN - Mathematics in the news.

MT - Methods of teaching.

NC - National Council news.

NS - News of the sponsoring organization.

RM - Recreational mathematics.

SA - Student activities.

ST - Special topics in mathematics.

T - Mathematics tests.

TA - Teaching aids or devices.

TT - Training of teachers.

WC - News of workshops and conferences.

TABLE 2

PERCENTAGE OF TOTAL SPACE DEVOTED
TO PARTICULAR TYPES OF ARTICLES

News-letter	NI	AM	CS	E	EE	EG	ER	HM	IS	MG	ML	MN	MT	NC	NS	RM	SA	ST	T	TA	TT	WC
Ark.	2			6							1		48		26	12				1		6
Cal.	3		25								8		16	10	23		5				10	3
Colo.	3	10	12	4		7			2		7		1	10	37	1						9
Ill.	4				21		3				6	4	9	1	32	2	3	5		8		6
Ind.	4		10	4		3			10			10	11	11	23	4	5			5	1	3
Iowa	1												14	21	11					36		18
Kan.	4	4	14			6	10		1	19	2	3		2	28			2		4	5	
Minn.	3		7	5			7		6			2	8	2	20	9	11			19	1	3
Mo.	3		3			6			7		11		8	18	20	1			23			3
N.E.	3		6						5				3	5	43	16		17				5
N.J.	1		13								13		15		22			37				
N.Y.	4		10		3		5	4	1	13			7	1	18	3	7	16	3	7	2	

TABLE 2   (cont.)

News-letter	NI	AM	CS	E	EE	EG	ER	HM	IS	MG	ML	MN	MT	NC	NS	RM	SA	ST	T	TA	TT	WC
Ohio	2								4		6			27	57							6
Ore.	3	2		7				4	5	3	2			2	25	28	6	6		7		3
Penn.	1								5						95							
Phila.	3										4			17	73	1						5
W.Pa.	5								25						53	12	1					9
Tex.	2	4	5		9				3	15	2		10	5	25	9	1			5		7
Utah	2		11						11	7				4	60					7		
Wis.	3		13					7	4		3		34	8	15	2	2		1	2	1	8

CHAPTER IV

Editors' Evaluations

Procedure - Any research or study program gains stature
if original sources and authoritative references are con-
sulted and utilized. In the study under consideration this
requirement has been largely fulfilled through the coopera-
tion of the editors of the various newsletters. The editors
are those who are most intimately concerned with the philoso-
phy and practical operation of newsletters. It is they who
are best versed in the details of maintaining a publication
and who can best supply much of the data of interest to this
survey. Accordingly, we turn to the editors for their
appraisal of their own journals.

Questionnaires were sent to the editors of each of the
twenty-two newsletters which were available for the survey.
Seventeen of the editors responded to the questionnaire, and
it is upon their comments that the data of this chapter are
based.

The questions posed to the editors were roughly of
three types. The first category was that of the content
and evaluation of the content of the newsletters. Each
editor was queried only with respect to his own publication
except for a single question relating to newsletters in

general. The second type of question involved information as to the actual physical publication of the newsletters or bulletins. Production costs, circulation figures and staff personnel were included under this heading. The third area of interest centered about the personal comments, suggestions and criticisms of the editors themselves.

Content - On the basis of Dr. Johnson's classification of material appearing in newsletters[1] and a brief perusal of the kinds of articles found in several publications familiar to the writer a list of thirteen major types of articles was drawn up as follows:

1. Announcements or reports of activities of the sponsoring organization.

2. Suggestions on methods of teaching.

3. Reports on educational research.

4. Book reviews.

5. News about teaching aids or devices

6. Problems or puzzles.

7. Editorials.

8. Notes concerning individual schools and teachers.

9. Poems and jokes.

10. Curriculum suggestions.

11. Summaries of speeches or lectures

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[1]Johnson, op. cit., pp. 99-100.

12.   History of mathematics and mathematicians.

13.   Announcements about workshops and conferences.

This listing did not necessarily include every type of article which might appear in all the newsletters, but it did indicate the major areas of interest most likely to be found in the publications. The editors were encouraged to add any new types of articles which they felt might be found in a mathematics publication, and eight other categories were suggested:

1.   President's message.

2.   Results of student examinations.

3.   Annotated bibliography of outstanding articles.

4.   Student reports.

5.   Cartoons or photographs.

6.   Advertising.

7.   Applied mathematics.

8.   Mathematics in foreign countries.

Some of the article headings are quite specific while others are fairly general and might even tend to overlap to some degree. It was felt, however, that the given list provided sufficiently wide coverage while at the same time avoiding unnecessarily fine discrimination between types of articles.

The editors were requested to designate for each type of article whether or not such articles were to be found in their newsletters or bulletins. They were also asked to state if they felt each article was worthy of inclusion in

their publications regardless of whether or not it was already being used. In this manner not only would a count be made of the types of articles appearing in the newsletters but an indication of what the editors considered worthwhile and appropriate would be available. Table 3 summarizes the data on newsletter content as given by the editors. The first thirteen article headings were included in the questionnaire whereas the eight below the double line are those written in by individual editors. The four columns to the right of the articles contain the number of editors who expressed the views listed at the top of each column.

It will be noted from the table that all seventeen of the editors stated that announcements of the activities of their sponsoring organization were part of the material found in their publications. Announcements about workshops and conferences and summaries of speeches were the next most frequently mentioned categories with sixteen and fifteen affirmative replies respectively. Of the suggested articles those on the history of mathematics and reports of educational research were mentioned least frequently, in each case four editors stating that such articles were used for publication. These figures would seem to indicate rather clearly that activities directly associated with the sponsoring organization are receiving the most widespread attention. This conclusion is not unexpected in that a professional group supporting a publication would quite logically give primary

TABLE 3

SUMMARY OF EDITORS' REPLIES ON
CONTENT OF THEIR PUBLICATIONS

Type of Article	Included in Publication	Worthy of Inclusion	Should Not be Included	No Opinion Expressed
Announcements or reports of activities of sponsoring organization	17	17	0	0
Suggestions on methods of teaching	9	16	1	0
Book reviews	5	12	3	2
News about teaching aids, devices	7	14	3	0
Problems or puzzles	12	14	0	3
Editorials	9	12	1	4
Notes concerning individual schools and teachers	9	14	2	1
Poems and jokes	10	13	2	2
Curriculum suggestions	7	16	0	1
Summaries of speeches or lectures	15	16	0	1
History of mathematics	4	13	2	2
Announcements about workshops and conferences	16	17	0	0
Reports on educational research	4	12	2	3
President's message	2	2		
Results of student examinations	1	2		
Annotated bibliography of outstanding articles		1		

TABLE 3 (cont.)

Type of Article	Included in Publication	Worthy of Inclusion	Should Not be Included	No Opinion Expressed
Student reports	1	1		
Cartoons or photographs	1	1		
Advertising			1	
Scientific papers on applied mathematics	1	1		
Mathematics programs in foreign countries	1	1		

attention to its own internal affairs. A second result to be noted is that except in the area of organizational activities no other category was accorded universal attention. Problems or puzzles, appearing in twelve newsletters, and poems and jokes, listed by ten editors, were the only other types which might be considered as common to a majority of the publications. The eight types of articles suggested by the editors themselves are examples of material to be found in individual cases but are not typical of newsletters in general.

Much greater agreement was to be found in the editors' opinions on the desirability of the suggested articles than was the case in the actual content of the newsletters. Each of the thirteen listed kinds of articles was considered worthy of being included in their newsletters by at least twelve of the seventeen editors. Reports of the sponsoring organization and conference announcements were again the most often checked categories with all seventeen editors agreed that articles of this nature were worthy of inclusion. Three other types of articles, suggestions on methods of teaching, curriculum suggestions, and summaries of speeches were listed as desirable by all but one of the editors.

Eight of the thirteen classified articles were considered as undesirable for publication by one or more editors. Three editors felt that book reviews and news about teaching aids should not be included in their newsletters, but no single

type of article was excluded by more than three editors. Although the editors were not asked to defend their opinions, several included explanations of their attitudes. The major reason for excluding articles appeared to be the lack of sufficient space. One or more editors expressed no opinion in nine of the thirteen categories, probably due to the absence of any strong feelings in these areas. The topic of editorials drew the largest number of "no opinions", a total of four. It is likely that the four editors who failed to comment on the desirability of editorials did not feel themselves to be in a position to properly evaluate their own efforts.

In addition to expressing his own views on the content of his newsletter or bulletin each editor was requested to rate the popularity and usefulness of the suggested articles among the readers of the publication. Short of an actual reader survey, similar to the one described in Chapter V, it would be difficult for an editor to accurately interpret his readers' preferences, and five of the editors felt unable to answer this part of the questionnaire. It was the hope of the author, however, to obtain at least a very general expression of the editors' views of readers' opinions in order to compare actual content of newsletters with what it was felt the readers desired. The twelve editors who replied to this question provide a basis for at least a rough picture of what the editors of newsletters feel to be their readers'

opinions.

Table 4 contains a summary of the ratings given by twelve editors to fifteen types of articles, the first thirteen being suggested in the questionnaire and the last two being suggested by individual editors. The first column contains the number of editors rating each type of article as one of the three most popular kinds among the readers, while the second column indicates the number of editors rating each article as one of the three most useful types in the minds of the readers. Announcements or reports of activities of the sponsoring organization was the type of article both most popular and most useful to the readers according to the editors' replies. Suggestions on methods of teaching and summaries of speeches were the second and third most popular types of articles in the opinion of the twelve editors who answered. Suggestions on methods of teaching and conference announcements were rated the second and third most useful categories by the editors. Editorials and the history of mathematics were the only two kinds of articles which failed to receive at least one vote as among either the most popular or most useful to the readers as interpreted by the editors.

Purpose - Three questions were directed at each editor concerning the purposes of his newsletter or bulletin.

TABLE 4

SUMMARY OF EDITORS' OPINIONS ON
STATUS OF SELECTED TYPES OF ARTICLES

Type of Article	Number Rating It Among Three Most POPULAR Types	Number Rating It Among Three Most USEFUL Types
Announcements or reports of activities of sponsoring organization	9	8
Suggestions on methods of teaching	6	7
Book reviews	1	2
News about teaching aids	4	4
Problems or puzzles	3	1
Editorials	0	0
Notes concerning individual schools and teachers	4	0
Poems and jokes	1	0
Curriculum suggestions	1	2
Summaries of speeches or lectures	5	6
History of mathematics	0	0
Announcements about workshops and conferences	3	7
Reports on educational research	0	1
Annotated bibliography of outstanding articles	0	1
Student reports	1	0

They are:

1. Does your newsletter have specific, well-defined objectives, and, if so, are they being fulfilled?

2. If there are no specific objectives, do you feel the newsletter justifies the efforts required to publish it?

3. What do you feel is the major purpose of your publication?

TABLE 5

SUMMARY OF EDITORS' REPLIES ON
OBJECTIVES OF NEWSLETTERS

	Yes	No	Partly
Are there specific, well-defined objectives	15	2	0
If so, are they being fulfilled	12	0	3
If not, is the effort justified	1	0	1

The responses to these questions are shown in Table 5 . Of the fifteen editors who stated that their newsletters had specific, well-defined objectives, twelve felt that these objectives were being realized, and three replied that they were being partially fulfilled. Only two editors reported the absence of definite purposes, and of these two, one felt that the efforts of publication were justified, and the other believed that the effort was partially justified. No editor was of the opinion that the objectives were unattained or that the work involved was of no avail.

As might be expected, a variety of answers were given

as to the major purpose of each publication. The most prevalent concept was that of providing reports on the work of the sponsoring organization, an objective which is borne out in the previously reported content of the publications. A second major objective was the improvement and enlargement of teaching methods. Other individual opinions expressed were the raising of teacher morale, discussion of topics of mutual interest, and uniting the teachers professionally.

Publication data - The statistics for four major points of interest in the publication of newsletters is given in Table 6 . Information is given for each of the seventeen newsletters whose editors returned the questionnaire sent them. The newsletters are listed by number only with no particular order of arrangement. The number of regular staff members ranges from one to sixty with a median of two. The one newsletter with sixty workers is an exceptional case involving volunteer workers in the actual publication of the newsletter. Only one editor reported a staff member who received pay for work on the newsletter, and this one paid worker was a typist.

The average circulation per issue varied from 100 to 1000 with 300 as a median figure. The frequency of publication ranged from one to four issues per year with two issues being the most common practice (eight newsletters of this type).

The highest publication cost per issue among the fifteen

TABLE 6

SUMMARY OF PUBLICATION DATA OF NEWSLETTERS

Newsletter	Number of People on Staff	Average Circulation Per Issue	Average Cost per Issue	Number of Issues per Year	Cost per Issue per Reader
#1	1	1000	$15-$25	1	$.01-$.03
#2	3	400	$150	2	$.38
#3	3-4	300	$35	4	$.12
#4	1	600	$15	2	$.03
#5	1	250	$65	4	$.26
#6	8	300	$40	4	$.13
#7	2	300	$50	2	$.17
#8	1	500		3	
#9		1000	$156-$160	4	$.16
#10	1	900	$30-$40	2	$.03-$.04
#11	3-4	285		2	
#12	2-3	350	Negligible	3	Negligible
#13	1	200	$10	4	$.05
#14	60	100	Volunteer	2	Negligible
#15	2	240	$30	3	$.13
#16	4	290	$25-$30	2	$.09-$.10
#17	3	300	$15	2	$.05

newsletters which reported average expenses was $160 while two newsletters were published with negligible expenses. The median cost per issue for the fifteen publications was $30. The costs per single copy of the newsletters are higher than might be expected. The cost per issue per reader for one newsletter turns out to thirty-eight cents, and the median for the group is nine to ten cents.

All seventeen editors reported that subscriptions to the newsletters were obtained through dues for membership in the sponsoring association, and only two of the publications received additional outside financial assistance. A state teachers' association and a local school board were the two agencies supplying the supplementary financial backing. The actual printing of the newsletters was accomplished by staff members in eight cases, commercially in seven others, and in two instances the printing was done in campus print shops.

Comments - Each editor was asked to submit any suggestions, criticisms, or comments with respect to his own publication or newsletters in general. In addition, the editors were specifically questioned as to the major problem confronting their publication and what one or two innovations they would most desire in their newsletters if financial costs were of no concern. The purpose of these questions was to elicit rather broad statements covering pertinent issues including the value, philosophy, problems, and expected outcomes of newsletters as seen by the editors.

The major difficulty experienced by the editors was apathy on the part of teachers. Seven different editors voiced concern over the lack of interest in the newsletters among teachers. Financial restrictions were the second most frequent problem while need for contributed material was still another major concern. Lack of time, too small a staff, and inexperience were other problems faced by individual editors. The innovation most desired among the editors was a more elaborate format for the newsletters with eight editors expressing a desire for improved makeup. The only other innovation receiving noticeable support was a paid or an increased working staff. Both of these suggestions stem from limitations imposed by budget restrictions.

The personal comments from the editors have been enthusiastic for the most part. Several editors indicated that the newsletters serve a vital function in catering to local interests, stimulating professional activities among teachers who might not otherwise share in the more formal programs of a national or regional body. The appeal to the individual teacher appears to be a major objective of the newsletters. On the negative side, the chief criticism is levied at teacher apathy. Despite the efforts to contact individuals and to cater to their interests the editors feel that there is a lack of sufficient cooperation in return. The need for more staff workers and contributors of articles is given as evidence of the problem.

CHAPTER V

Readers' Evaluations

<u>Procedure</u> - A personal examination of available
mathematics newsletters and a survey among the editors of
these publications have served as the basis for the two
preceding chapters of this thesis. It is the readers of the
newsletters who have furnished the data presented in this
particular chapter. It may be assumed that any public
journal or any house organ is published on behalf of and
according to the interests of its readers. Mathematics
newsletters fall within this classification and it is
presumed that they are in existence primarily to contact
and be of assistance to the mathematics teachers located in
the area served by the individual publications. On this
basis, any survey, such as this one, of the status and
practices of mathematics newsletters must of necessity take
into consideration the reactions and opinions of the
newsletters' readers, that is, the individual mathematics
teachers. Accordingly, there was drawn up a readers'
questionnaire consisting of two sections -- the first,
relating to the content and the readers' evaluation of the
content of the newsletters, was very similar to that sent
to the editors, while the second part was devoted to the

readers' attitudes, suggestions, and criticisms.

Two points should be noted as to the method of sampling used in this part of the survey. First, in view of the purposes and scope of this project, it was decided to limit the sample to between five and ten readers of each news-letter included in the survey. It was felt that such a number would provide a general overview of readers' opinions and would indicate any major criticisms or suggestions, although to obtain a truly accurate gauge of readers' reactions a much larger sampling would be imperative. A survey concentrating entirely on readers' opinions appears to be an interesting one, and a suggestion to this effect will be made in Chapter VI. Secondly, it is to be recognized that the names of the readers questioned in this project were obtained directly from the editors of the newsletters. The principal reason for this method of selection was that no other source was readily available for compiling the names of the newsletter readers. The objection may be raised that the editors would tend to list only those readers whom they personally knew, thereby presenting a biased sample. To avoid this difficulty, the editors were requested to select the names at random from their mailing list, and the wide geographic spread of the readers submitted by the editors indicate that such a procedure was followed. Moreover, the questions included in the questionnaire were, with two

exceptions, confined to personal opinions with no implica-
tion of criticism or complaint as far as the management of
the newsletter was concerned. Therefore, it would be of
little import whether or not the readers were favorably
disposed toward the editors as individuals. The frankness
and range of the answers actually received indicate that the
sampling procedure was satisfactory.

Of the seventeen editors participating in the survey,
fourteen supplied a list of readers. The remaining three
editors were not asked to provide names because of the late
date at which their questionnaires were received. A total
of eighty-four questionnaires were sent out to readers of
the fourteen newsletters whose editors provided names.
Fifty-two readers representing thirteen different newsletters
responded to the questionnaire, but only forty-eight of the
replies were tabulated. The other four readers were unable
to answer because they felt they were not well enough
acquainted with their local newsletter. Table 7 indicates
the distribution of questionnaires among the several news-
letters.

Content - As in the case of the editors' replies, the
forty-eight questionnaires are tabulated as a group without
reference to individual newsletters. Table 8 provides a
breakdown of the readers' replies concerning the content of
their newsletters. The same thirteen categories of articles
as used with the editors were suggested, and the only new

TABLE 7

DISTRIBUTION OF READERS' QUESTIONNAIRES

Newsletter	Number of Names Submitted	Number of Questionnaires Sent	Number of Questionnaires Returned
#1	5	5	2
#2	12	9	5
#3	5	5	2
#4	5	5	3
#5	8	8	5
#6	8	7	5
#7	5	5	3
#8	6	6	5
#9	10	8	3
#10	6	5	3
#11	5	5	5
#12	10	8	3
#13	2	2	0
#14	8	6	4
Totals	95	84	48

TABLE 8

SUMMARY OF READERS' REPLIES ON
CONTENT OF THEIR PUBLICATIONS

Type of Article	Included in Publication	Worthy of Inclusion	Should Not be Included	No Opinion
Announcements or reports of activities of sponsoring organization	48	47	0	1
Suggested methods of teaching	34	41	4	3
Reports on educational research	33	39	6	3
Book reviews	14	32	11	5
News about teaching aids	40	46	1	1
Problems or puzzles	33	42	4	2
Editorials	31	40	2	6
News about individual schools and teachers	34	41	5	2
Poems and jokes	22	30	12	6
Curriculum suggestions	26	39	6	3
Summaries of speeches or lectures	35	41	4	3
History of mathematics	15	32	11	5
Announcements about workshops and conferences	48	48	0	0
Exchanges	0	1		

type added by a reader was that of exchange articles. All forty-eight readers stated that reports of the sponsoring organizations' activities and announcements about workshops or conferences were included in their local newsletters. News about teaching aids was listed by forty of the readers as part of their publications. Eight of the other types of articles were included in the replies of from twenty-two to thirty-five of the readers. Book reviews and articles on the history of mathematics were the two least frequently mentioned categories with only fourteen and fifteen readers indicating these types were included in their local newsletters.

Every one of the thirteen suggested types of articles was considered worthwhile by a large majority of the readers who were polled. Announcements about workshops and conferences, reports of activities of the sponsoring organization, and news about teaching aids, receiving forty-eight, forty-seven, and forty-six favorable replies respectively, were the three most frequently supported categories. Poems and jokes, book reviews, and articles on the history of mathematics had the fewest number of readers who felt they were worthy of inclusion in the newsletters. Poems and jokes were considered worthwhile by thirty readers, while the latter two types were each mentioned on thirty-two replies. From these results it is evident that the readers, like the editors, were virtually unanimous in the belief that news directly related to the

activities of the parent organization deserved attention in the newsletter. Opinion on the other eleven types of articles was much more varied.

Eleven of the thirteen suggested types of articles were marked as undesirable for inclusion in the newsletters by at least one reader. Poems and jokes were listed twelve times as being undesired, and book reviews and articles on the history of mathematics were each excluded by eleven of the forty-eight readers. None of the other kinds of articles received more than six unfavorable replies. As would be expected from previous results, the two categories which no one felt ought to be excluded were the reports on activities of the sponsoring organization and announcements about workshops and conferences.

It will be recalled that each editor of a newsletter was asked to list the three types of articles he felt were most popular among his readers and also the three he felt the readers considered most useful to them. In the same fashion the readers were requested to indicate their three favorite kinds of articles as well as the three they believed were most useful to them. Table 9 illustrates the number of readers rating the given articles as among either their three most popular or three most useful types. It is interesting to note that reports of the activities of the sponsoring organization and announcements about workshops and conferences, the two types of articles rated as worthy of inclusion by far more

TABLE 9

SUMMARY OF READERS' OPINIONS ON
STATUS OF SELECTED TYPES OF ARTICLES

Type of Article	Number Rating It Among Three Most POPULAR Types	Number Rating It Among Three Most USEFUL Types
Announcements or reports of activities of sponsoring organization	11	13
Suggestions on methods of teaching	26	31
Reports on educational research	7	9
Book reviews	1	3
News about teaching aids	27	27
Problems or puzzles	12	6
Editorials	3	3
Notes concerning individual schools and teachers	10	3
Poems and jokes	1	0
Curriculum suggestions	8	6
Summaries of speeches or lectures	11	12
History of mathematics	11	6
Announcements about workshops and conferences	12	20

editors and readers than any other kinds of articles, were decidedly outranked by two other categories as far as popularity and usefulness were concerned.

The two most popular types of articles by more than a two to one count were found to be news about teaching aids and suggestions on methods of teaching. Twenty-seven readers considered news about teaching aids as one of their three favorite types of articles and twenty-six listed suggestions on methods of teaching as among their favorite types. Problems or puzzles and announcements about workshops and conferences were marked as favorite articles by twelve readers each. The other nine categories trailed off in popularity with book reviews and poems and jokes each receiving but a single vote as being one of the three most popular articles among the readers.

Suggestions on methods of teaching was unquestionably the most useful type of article in the opinion of the readers. Thirty-one of the forty-eight readers in the survey rated this category as one of the three most useful to them. News about teaching aids, which ranked first in popularity among readers, was rated second in usefulness with twenty-seven votes. The only other type of article to be listed by twenty or more readers as being one of their three most popular ones was that of announcements about workshops and conferences. Announcements or reports of activities of the sponsoring organization which was the one category marked

worthy of inclusion by virtually one hundred per cent of
editors and readers alike was considered as one of the most
useful types by only thirteen readers, barely more than one-
fourth of all those surveyed. The only kind of article which
failed to appear on at least one list of most useful types
was that of poems and jokes. The other nine types of articles
were thought to be among the most useful by from three to
thirteen readers.

Comments - The second portion of the readers' ques-
tionnaire consisted of ten questions centering around reading
habits, opinions, and suggestions. The first two items
dealt with the extent to which the newsletters were read and
the professional value of these publications to the readers.
Table 10 summarizes the readers' responses to the two ques-
tions.

TABLE 10

SUMMARY OF READERS' REACTIONS
TO THEIR NEWSLETTERS

	Definitely	Somewhat	Very Little
Do you generally read your newsletter thoroughly?	32	13	3
Do you personally feel that the newsletter aids you in being a better professional person?	29	15	4

The figures show that two-thirds of the readers in the survey read their newsletters completely while only three individuals said they read only small portions. The responses also indicate a somewhat smaller number of readers who felt that the newsletters were of definite professional value to them as individuals. It would be worth determining whether the sixty per cent figure obtained here for the number who feel their newsletters are definitely a professional asset was an accurate statistic for a much larger sample of readers.

Four questions were asked relative to the publication policies of the newsletters as interpreted by the readers. The responses are tabulated in Table 11 .

TABLE 11

READERS' OPINIONS OF PUBLICATION POLICIES

Question	Yes	No	No opinion
1. Do you feel free to contribute material to the newsletter?	46	2	0
2. Have you ever contributed material for newsletter publication?	35	13	0
3. Do you feel the newsletter is managed on the basis of the opinions of the readers?	31	9	8
4. Do you feel material primarily for secondary school students should be included in the newsletter?	18	29	1

There appears to be little question that the readers consider themselves free to share in the newsletters' operation should they so desire, and three-fourths of the readers who participated in the survey stated that they had actually contributed material for publication. Of the thirty-five readers who contributed material for the newsletters, however, six had done so only once or twice, and twenty-two had done so only "occasionally". Seven readers had prepared material "frequently". It appears doubtful that so large a percentage of contributors as indicated above would be found in the general population of newsletter readers, for a comment frequently expressed by readers and editors alike was that a large proportion of classroom teachers were not willing to provide material for publication.

Although thirty-one readers felt that the newsletters were being managed according to readers' opinions, nine believed this was not the case and eight others expressed no opinion. These figures do not necessarily indicate a weakness among the newsletters, but they do suggest some effort ought be made to guard against dissatisfaction among the readers if such a policy is not already in effect.

This survey was limited, it will be recalled, to newsletters catering primarily to teachers rather than students. Twenty-nine of the forty-eight readers questioned felt that the newsletters should continue on a teacher's level while eighteen others believed that it would be desirable to

include some material intended primarily for secondary school students. These results would indicate that a final decision on this question would best be made on an individual basis with each newsletter determining its own type of policy. The purposes and objectives of both the newsletter and its sponsoring body would obviously need to be taken into account on this point.

Turning to a more general area of evaluation, we may consider the readers' feelings with respect to the most important contribution of newsletters and also the major weaknesses of the newsletters most familiar to them. Three possible contributions of newsletters, namely building of professional spirit, aiding in classroom teaching, and helping to make teaching more interesting were suggested in the questionnaire, but room was provided for other alternative expressions. Some readers marked more than one contribution, and two additional types of accomplishment were offered by several readers.

From Table 12 it is seen that a majority of the readers looked upon the major contributions of newsletters as being the building of professional spirit. All five categories mentioned may be thought of as included in the single topic of professional growth. The unanimity of opinion among the readers tends to corroborate the implication in the title of this thesis that newsletters are indeed professional aids to teachers.

TABLE 12

MOST IMPORTANT CONTRIBUTIONS OF NEWSLETTERS
AS SEEN BY READERS

Contributions	Number of Readers Listing It
Build professional spirit	29
Aid in classroom teaching	16
Make teaching more interesting	6
Provide organizational news	4
Unify teachers	2

A wide variety of answers came forth as examples of the major weakness of the newsletters, although some readers apparently felt there was no inadequacy in their local publications. The comments received have been grouped into five categories which are listed in Table 13 along with the number of readers responding in each area.

TABLE 13

READERS' SUGGESTIONS OF MAJOR WEAKNESSES
IN NEWSLETTERS

Weakness	Number Reporting It
Inadequate content	11
Too infrequent publication	9
Lack of contributions from classroom teachers	8
Inadequate format or space	7
Poor circulation	2

Although the most often mentioned criticism was that of
inadequate content, the readers were not agreed as to what
constituted the best material. Some readers felt more
scholarly, professional articles were desirable while others
claimed there were too many reports and too few practical
classroom suggestions. Reference to Table 8 previously
discussed in this chapter will make it evident that a wide
range of articles would be required to satisfy the preferences
of all the readers. From the results shown in Table 13
it would be safe to say that larger and more frequent news-
letters would be welcome among the readers.

Closely allied with the topic of the major weaknesses
in newsletters were two questions asking for possible innova-
tions in newsletters and any criticisms or statements
pertaining to newsletters in general. The responses to these
questions were alike in many respects and were easily
incorporated into suggestions for the possible improvement
of newsletters. The readers' statements have been assimilated
under six major headings as shown in Table 14.

It will be noted that the first five suggestions in the
table all involve the concept of enlargement or expansion.
To actually implement all these suggestions would in all
likelihood require considerable financial support, the source
of which is not particularly obvious. It might be said,
however, that one reader stated that finances were of no
major concern to his newsletter, but rather the chief difficulty

lay in securing sufficient and interested personnel to service the newsletter.

TABLE 14

SUGGESTIONS FOR IMPROVING NEWSLETTERS

Comment	Number Suggesting It
More comprehensive content	9
More frequent issues	9
Physical improvements (size, printing, photographs, etc.)	11
More teaching suggestions	7
Wider and free circulation	4
Concentrate on local interests	6

The last item in Table   is worthy of particular mention because it is of a different nature than the other suggestions and it also involves the question of the basic purposes of newsletters. Six different readers remarked that the newsletters should concentrate on local news and material not available elsewhere. It was stated that articles or content which could be found in standard references or periodicals were sometimes being published by newsletters, and accordingly other desirable material was being neglected. A further comment reported was that the newsletters would be of greater value if they emphasized items

of an informal nature, leaving the more formal type of article to publications such as The Mathematics Teacher or The Arithmetic Teacher. This procedure, it was stated, would encourage more widespread participation on the part of individual classroom teachers.

While numerous suggestions for improving newsletters were submitted, it should be realized that the readers were generous in their praise of the valuable work being accomplished by the publications. A number of readers had no criticisms to offer, and when asked what innovations he might care to see in his local newsletter one reader responded, "None, we have a good one!"

Chapter VI

Conclusions

In a survey of existing conditions in any given
field firsthand data provide the most appropriate and
convincing conclusions. The three preceding chapters of
this thesis contain the essential quantitative facts
necessary for a competent appraisal of mathematics news-
letters or bulletins as they exist today. From the mass
of data previously presented and discussed, however, a
number of pertinent generalizations and conclusions may
be drawn.

Purpose - Unquestionably the major purpose of math-
ematics newsletters as determined by this survey is the
professional improvement of teachers of mathematics with
the resultant raising of the quality of mathematics in-
struction. In attempting to realize this objective the
newsletters have sought to disseminate material of two
kinds - that directly related to the professional body
sponsoring a publication and that concerning the actual
teaching of mathematics.

Editors and readers are largely agreed that the news-
letters are making a significant contribution in the area
of the teaching of mathematics and in serving as a common
bond uniting those people concerned with mathematics and
education. Judging from the remarks of readers and editors
alike, mathematics newsletters are performing a necessary

and valuable service.

Content - Although the range of the types of articles to be found in newsletters is wide, a major portion of the content may be classified under thirteen headings which have been used extensively throughout this project. These headings are as follows:

1. News of activities of the sponsoring organization
2. Suggestions on methods of teaching
3. Reports on educational research
4. Book reviews
5. News of teaching aids or devices
6. Problems and puzzles
7. Editorials
8. News of individual schools and teachers
9. Poems and jokes
10. Curriculum suggestions
11. Summaries of speeches and lectures
12. Special topics in mathematics
13. News of workshops and conferences

By far the most frequent type of article found is that relating to the activities of the sponsoring organization. All of the thirteen major types of articles are felt to be worthy of publication by a large percentage of both editors and readers.

The opinions of the editors and readers as to the popularity and usefulness of the several types of articles

vary somewhat. Table 15 lists the rank in popularity and usefulness of thirteen suggested types of articles as indicated by editors and readers of the newsletters. Announcements of activities of the sponsoring organization, rated as the most popular type of article by the editors, is listed only as fifth in popularity among readers. Conversely, news about teaching aids or devices, ranked first in popularity by readers, is fourth in popularity according to the editors' views.

With respect to the usefulness of various kinds of articles there is a similar divergence of opinion. As may be seen from table 15 , articles dealing with suggested methods of teaching were felt to be most useful by the teachers, whereas news of the sponsoring organizations' activities was rated most useful by the editors of the newsletters.

Tables 16 and 17 provide a further comparison of popularity and usefulness ratings on an individual newsletter basis. For each of the eleven newsletters for which both editors' and readers' ratings were obtained, the three most popular and most useful types of articles are listed. In only seven instances were articles given the same popularity rating by both the editor and the readers of a newsletter. Similarly, in ratings of usefulness only seven cases of agreement between editors and readers were found.

TABLE 15

COMPARISON BETWEEN EDITORS' AND
READERS' RANKING OF SELECTED TYPES OF ARTICLES

Type of Article	Popularity		Usefulness	
	Rank Given by Editors	Rank Given by Readers	Rank Given by Editors	Rank Given by Readers
Announcement of activities of sponsoring organization	1	5	1	4
Suggested methods of teaching	2	2	2	1
Reports on educational research	11	9	8	6
Book reviews	8	12	6	10
News about teaching aids, devices	4	1	5	2
Problems or puzzles	6	3	8	7
Editorials	11	11	10	10
Notes about individual schools and teachers	4	8	10	10
Poems and jokes	8 -	12	10	13
Curriculum suggestions	8	9	6	7
Summaries of speeches and lectures	3	5	4	5
History of mathematics	11	5	10	7
Announcements of workshops and conferences	6	3	2	3

TABLE 16

BREAKDOWN OF EDITORS' AND READERS' RATING OF POPULARITY OF SELECTED ARTICLES

NEWSLETTERS / ARTICLES	#1 Ed.	#1 Read.	#2 Ed.	#2 Read.	#3 Ed.	#3 Read.	#4 Ed.	#4 Read.	#5 Ed.	#5 Read.	#6 Ed.	#6 Read.	#7 Ed.	#7 Read.	#8 Ed.	#8 Read.	#9 Ed.	#9 Read.	#10 Ed.	#10 Read.	#11 Ed.	#11 Read.
Methods of Teaching	1	1				2	2		1	1			1	3	2	2	1		1	1		
Problems or Puzzles	2	3	3			1							2									
Notes of Individual Schools or Teachers	3			1				2				1									3	
Teaching aids or Devices		2								2		2	1	1	1	3	3			2		
News of Sponsoring Organization			2	1	1			1				1	3			2		1		3	1	1
News of Workshops and Conferences				2	2		3									3					2	2
Summaries of Speeches or Lectures				3	3			3	3	3						3				2		3
Editorials						3																
Educational Research							1				2							2				
Curriculum Suggestions									2											3		
Book Reviews												3										
Cartoons, Photographs													3									

TABLE 17

BREAKDOWN OF EDITORS' AND READERS' RATINGS OF USEFULNESS OF SELECTED ARTICLES

NEWSLETTERS / ARTICLES	#1		#2		#3		#4		#5		#6		#7		#8		#9		#10		#11	
	Ed.	Read.	Ed.	Read.	Ed.	Read.	Ed.	Read.	Ed.	Read.	Ed.	Read.	Ed.	Read.	Ed.	Read.	Ed.	Read.	Ed.	Read.	Ed.	Read.
Methods of Teaching	1	1			1				1	1	2	1	2	2		2		1	1	1	1	
History of Mathematics		3																				
Educational Research	3							3				3						3				3
Teaching aids, Devices	2	2								2		2	1	2	1		2			3	2	
News of Sponsoring Organization			1	1	1		1	2			1		1		1		1					1
Problems, Puzzles			2				2															
News of Workshops and Conferences			3	2	2	3	3					3		3		3				2	3	2
Summaries of Speeches and Lectures				3	3		2	1	3	3						3			3			
Curriculum Suggestions									2									2				
Book Reviews											3			3								
Mathematics in the Literature																			2			

While the above comparisons were made on the basis of
a limited sample of readers, it would appear that there is
a definite variance between the articles most highly rated
by the readers and those most frequently mentioned by
editors. These results suggest that perhaps many of the
newsletters are concentrating on certain material out of
proportion to that justified by the attitudes of the
readers of the newsletters. If this conclusion is valid,
a prime target in the improvement of newsletters would be
a re-evaluation of the desirability of the several types
of articles utilized.

Publication - Virtually all of the newsletters re-
porting in this survey indicated that they were being pub-
lished under limitations of time and space. There was
widespread agreement as to the desirability of an extensive
range of articles, but because of space restrictions
preference had, of necessity, to be given to those articles
considered of prime importance. A shortage of time on
the part of those responsible for the preparation of the
newsletters is also evident from the remarks submitted by
both editors and readers. Without doubt, increased staff
assistance and greater financial support would be welcome
improvements in the publication of the newsletters.

With but two or three exceptions, the newsletters or
bulletins are decidedly informal. They are directed
toward the individual teacher for the most part and avoid
the use of elaborate format or the formal presentation

of material.

Suggestions for further study - The imposition of the restrictions mentioned earlier in this work gives rise to several suggestions for studies related to the one discussed here. A reader survey similar to that described in chapter V, but based on a more extensive sample of newsletter readers would be of interest and real value.

This thesis has been concerned for the most part with quantitative data. An interesting project might well center on the establishment of criteria for the evaluation and rating of newsletters as to their efficiency, readability, and attractiveness.

Still a third possibility of contributing to the improvement of newsletters lies in an exhaustive study of a single publication. The determination of specific objectives, preparation of material, means of publication, and format of the newsletter would be of value as a guide for other publications. The interest and cooperation encountered by the writer in the course of this survey attests to the desire of teachers to improve their newsletters and the need for an objective analysis of professional publications.

APPENDIX

Copies of typical newsletters

PROBLEM SITUATIONS IN HIGH SCHOOL MATHEMATICS

Lester W. Schlum
Andrew Jackson High School, New York City.

The justification for public education in America is the need for our democratic society for an educated citizenry. What chiefly distinguishes life in a democratic society from that in other forms of human organization is the need for creative participation in its affairs by its members. This creative participation is almost synonymous with the ability to recognize and to solve problems and to possess the disposition to do so.

Problem solving is thus one of the most important aims of the teaching of mathematics. Not only do most real problem situations have quantitative or spatial aspects, but mathematics itself is ideally suited as the vehicle for the study of general procedures of problem solving and for development of the habit of problem solving.

There are two basic ways to incorporate genuine problem situations into our school instruction. One is to make problems the center of the curriculum organization, with subject matter areas contributing concepts and skills needed to solve them. This is the core curriculum approach. The other is to create problem situations within our framework of subject matter organization. This writer believes that, on the secondary school level, the structure of mathematics itself makes the first approach impossible. In addition, the subject matter on this level is advanced enough to require the teaching services of a person with a specialist background in the field.

How then can we set up improved problem solving situations in the mathematics classroom? We must first consider what a problem is. A problem occurs when an individual is confronted with a situation to which he feels compelled to react and yet for which he does not immediately see the correct or appropriate reponse. A situation is thus not a problem situation per se, but is a problem with respect to a particular individual. So-called verbal problems in algebra are not generally problems to students; perhaps the first one attacked is if a student is interested in getting a solution. Certainly, after a student has learned a standard procedure for solving a type problem, others of that type are not problems to him. On the other hand, $X + 2 = 3$ may be a genuine problem situation for a student meeting it without having had any experience with equation solving. Creating problem solving situations in the classroom, therefore, implies the use of certain techniques rather than the teaching of certain subject matter.

Examining classroom teaching practice in the light of the definition of a problem given in the foregoing paragraph reveals that many opportunities for developing the habit and ability to solve problems are ignored. The following eight techniques are suggested as ways to improve the usual teaching pattern so as to create more and better problem situations.

1. **The Role of the Teacher.** The biggest obstacle to the creation of genuine problem situations in a classroom is the teacher. He is always right; he always knows the answer to any problem; therefore, it is not a problem. He generally interprets his function as that of helping students to solve problems, when his main role ought to be to see that problems are created for students. The writer once made an accidental error in teaching a lesson and was corrected by a student whose lengthy explanation was closely attended by the class. The writer was astonished to find that an inventory test at the end of the week revealed that the item in which the error had occurred had been better learned than any other item taught that week. Capitalizing on this experience, the writer has since adopted the unorthodox techniques of including deliberately false and misleading statements in his teaching and of criticizing perfectly correct recitations by students. A student thus forced to defend his contentions develops a superior understanding of the topic; the class, forced continually to distinguish between correct and incorrect statements, develops an alert and critical attention to everything that goes on. Students, at first astonished by this procedure, soon found genuine fun in being able to best the teacher in a battle of wits. Students with false notions on certain topics have these brought openly into a discussion and forcefully rejected. Incidentally, a forceful rejection of a false idea seems to be the answer to the fear that introduction of such ideas may be psychologically unsound.

2. **The Forked Road Approach.** A genuine problem situation approach requires a learner to examine possible alternative reactions and to choose the one that represents a satisfying solution. Most classroom teaching of new concepts and skills sees a teacher bending all his skill to getting a learner to go down the path of correct response and to steer him sharply away from false leads. The thesis in this paper is that the teacher ought deliberately to set up or to encourage students to suggest and examine alternative solutions. For example, when teaching the addition of radicals, the writer invites consideration of $5\sqrt{6}$ as well as $5\sqrt{3}$ as possible answers to the problem $\sqrt{3} + 4\sqrt{3}$.

Not only should the correct solution be rationalized, but examination of such a question as does $\sqrt{16} + \sqrt{9} = \sqrt{25}$ should lead to a rejection of the first possibility in a way that is based on genuine student understanding. Without the experience of discovering where the wrong

branch of a forked road leads, a student never really understands why he must not travel it.

Part of knowing what a thing means consists in understanding what it is not. It is this writer's experience that students, having once examined critically the question of the addition of radicals as suggested here, approach with greater interest in the meaning of the situation their first problem experience with the multiplication of radicals. An answer for $\sqrt{2}$ x $\sqrt{3}$ cannot be too glibly accepted as $\sqrt{6}$ after the rejection of $\sqrt{2} + \sqrt{3} = \sqrt{5}$.

3. **Sufficient and Insufficient Data.** One of the most vital aspects of genuine problem solving is the selection of data that are relevant to a solution. Textbook problems in mathematics are almost never written in a way to include this feature. It is a simple matter to include superfluous data in classroom problem situations. The writer's experience is that students who have had considerable experience with problems containing extra information examine the role of all given items, even in the just sufficient situations, with a much more critical eye. The relevance of the given items are inseparably bound up with the relationships existing among them; thus, critical study by the students of the sufficiency and necessity of the given data results in an improved understanding of the relationships involved in the problem.

Problem situations with insufficient data are also productive of genuine understanding. For example, classes are asked to solve the problem: Two motorists start at the same time and place and travel at rates of 30 mph and 40 mph, respectively. After how many hours will they be 210 mi apart? Few other methods of problem solving instruction build an understanding equal to that of a student who excitedly explains that the reason for his classmates' getting two different solutions to this problem is that some of them assumed the motorists to be traveling in the same direction and some in the opposite direction, or a colleague who points out that an infinite number of solutions exist, since the problem does not specify travel along the same road.

4. **Unsolvable Problems.** Mathematics textbook problems generally are solvable, but real problems may be problems because there is no solution. Much valuable understanding of the mixture problem situation can be brought about through attempting to solve a problem such as this: How many pounds of 30-cent candy must be mixed with 40-cent candy to produce 20 lb. of candy to sell at 50c per pound? Trying to interpret the equation set up to describe this situation promotes insight into the mixture relationship.

5. **No Question Formulated.** A genuine life problem occurs when an individual in the course of manipulating or thinking about some elements in his environment encounters a question of his own to which he wants an answer. No teacher presents him with data and asks him to draw a conclusion that the teacher already knows. If we want to build in students the disposition to recognize and solve problems, we must have problem situations arise in the classroom in this natural way. It is suggested that a teacher often present a situation, say the definition of a parallelogram in geometry, without asking any questions to direct class thinking. Time given to the students to explore the situation can result in their discovery of the theorems on the properties of the parallelogram. What is more, because it is self-directed, thinking

of this sort is more meaningful to a student than thinking directed by the teacher.

6. **Student Evaluation of Answers.** In life situations, a problem-solver does not go to an authority for approval of a solution. Knowing when one has a correct solution is part of problem solving. How different is the classroom situation where the teacher indicates approval of student suggestions that lead in the correct direction, discourages unpromising leads, and stops the discussion when some student reaches the correct solution. The writer has found it of inestimable value in developing critical thinking and the problem solving attitude to try to prevent any hint of correctness from coming in any way but from student understanding of the problem.

If a teacher can manage to look puzzled, or at least noncommittal, even when correct suggestions occur, or can continue to let students explore other ideas after the correct one has been suggested by one of their number, he can stimulate a critical attent'on to the reciting student by all members of the class. A student's faith that his teacher will see that the right answer always results often leads to inattentiveness on his part to the phase of the lesson that should lay a foundation for understanding. Members of the class should be encouraged to discuss each other's suggestions and to decide when a problem has been solved.

7. **No Immediate Answers.** In life problems, when no answer is immediately forthcoming, no higher authority steps in with an explanation of the solution. In the classroom, the teacher who is fearful that further floundering by the students will cause too much time to be wasted on a topic and comes to the rescue of his students, encourages mental laziness. He certainly fails to train his students in the mental perseverance necessary for true problem solving.

The writer has found it valuable to assign problem situations for which it is announced that no answer will be expected for a week. For example, an algebra class, having mastered the laws of exponents for positive integers, is asked to think for a week about the possible meaning of X $\_2$, the honor system being invoked to discourage consultation of textbooks or older brothers and sisters. Material learned in this way is more meaningful. In order to develop understanding there is no equal to looking at a problem from many points of view. There is no motivation for the study of mathematics as powerful as the joy of a student who has done extensive mental wrestling with a problem and has reached a successful solution. Even those who do not reach this goal, build understanding and develop an appreciation for a correct solution, an appreciation that does not appear when correct solutions come effortlessly through the direction of the teacher.

8. **Experimentation with Related Questions.** An efficient teacher feels that he must stick to his topic. Tangential discussions must be avoided. By so doing, he ignores the exploitation of many side issues that are genuine problems, because they are questions that occur to the students themselves. In addition, exploration of these side issues often throws light on the main issue. The construction of the perpendicular bisector of a line segment is usually developed with the two determining points on opposite sides of the given segment. It is helpful to consider the case of a member of the class who draws his segment too close to the edge of the

paper to use this procedure.

9. **Summary.** The techniques decribed in this paper are valuable not alone in that they provide opportunities for problem solving situations, but also in that they develop critical thinking and understanding of the discussed subjects to a greater degree than do the usual classrooms procedures. This point is illustrated by the experience of a student who challenged a question on the New York State Regents Examination in Trigonometry, June 1954. The question asked whether triangle ABC must be (a) acute, (b) obtuse, or (c) right if sin A = cos B. Only a student trained to examine every situation critically could overcome his respect for a Regents Examination and explain that although (c) was probably the expected choice, (b) might also be correct. The latter would be true in case A equals 91 degrees, B equals 1 degree, and C equals 88 degrees; in this case sin 91 degrees equals 89 degrees equals cos 1 degree; that is, sin A equals cos B.

THE ONE YEAR INTERMEDIATE ALGEBRA COURSE

Paul Smith, East High School, Rochester

The new syllabi in mathematics for grades 10, 11, and 12 have been printed and are now available to all teachers for study, use, and experimentation. In the foreword that accompanies these syllabi the statement is made that "results seem to justify replacing the present program with the sequential one proposed by the committee." The purpose of this article is, in the first place, to point out that with respect to the eleventh year syllabus results do not by any stretch of the imagination justify replacing the entire old program by the new; second, to caution teachers concerning the use of this syllabus for **all** students who take mathematics beyond grade 10; and, finally, to enlist the support of teachers in persuading the state department to make available without further delay a new syllabus for a year course in intermediate algebra.

The course of study for the eleventh year has been tried out in a number of schools by well-trained and experienced teachers. The consensus of opinion is that for **accelerated** students it works very well, but for the average and slightly below average students it does not work at all. Thus, to force all students who register for mathematics beyond grade 10 into such a course would result in immeasurable harm not only to them but to the entire mathematics program in New York State. The syllabus committee members were well aware of this problem and offered what they believed was a solution, namely, an integrated sequential one-year course in intermediate algebra. The syllabus was written, notes on teaching the course were provided, and a teaching sequence and time schedule were suggested. But the state department did not see fit to include this course with the other offerings in the printed syllabus. Why? Is there anything new or unusual or undesirable about a multiple track program?

Must all students electing mathematics beyond grade 10 be fitted into the same pattern? Or, is it thought, perhaps that the proposed one-year intermediate algebra course is a departure from the policy of sequential integrated mathematics and a denial of the intent to break down compartmentalized mathematics? A glance at the proposed one-year intermediate algebra course reveals that this is far from the truth. The only essential difference between the printed eleventh year course and the proposed one-year intermediate algebra course is that the latter does not include any analytical trigonometry. Why, then, the objection to the course and why the decision not to include it in the recently printed syllabus?

We all know that the old one-semester syllabus in intermediate algebra as used at the present time amounts to little more than training students in a few manipulative tricks, which enable them to pass the Regents Examination. We are not able to teach them understanding of mathematics under this syllabus for the simple reason that we are not given the time to do so. Unquestionably there are in our schools many students who need and who should have a full year of mathematics beyond grade 10. For the most part, these students have shown no unusual aptitude for mathematics and are not likely, if they go to college, to continue with the study of mathematics beyond their freshman year. What have we to offer them? Shall we continue to give them one semester of intermediate algebra that leads nowhere? Shall we herd them all into eleventh year mathematics, a course for which they are not at all suited? The answer is clear. For these students we must have a year course in intermediate algebra that will give us time to put emphasis on meaning and understanding and that will provide the same kind of sequential and integrated mathematics as is presented throughout the entire new syllabus.

At the last meeting of the Association of Mathematics Teachers of New York State strong resolutions concerning this question were passed and copies of the resolutions were sent to the state department. Why should there be further delay? WE NEED THIS SYLLABUS AND WE NEED IT NOW.

GREETINGS FROM YOUR PRESIDENT

I should like to extend greetings and best wishes to every member of AMTNYS at this, the beginning of another year of activity. We, whom you elected to office, will do our very best to carry on the work of the organization in the year ahead. I know that each of you feel that you benefit from your membership in the Association.

The best way to secure benefits is to contribute. Contribute articles to the NEWSLETTER, attend meetings, send in suggestions to the chairmen of committees, get new members interested in the purposes of AMTNYS, and exchange ideas with fellow members of the organization.

Already, committees are at work to make the annual meeting May 6 and 7, 1955, as successful as all the preceding ones. The members of those committees responsible for the planning of the annual meeting are particularly desirous of your suggestions. They want to provide the sort of meeting that you will find helpful and enjoyable.

Congratulations go to the more than 1000 members who believe so earnestly in AMTNYS. All deserve credit for the growth of the organization. Let us continue the enthusiastic support exhibited in the past in order that each year we may give evidence of definite progress in mathematics education in New York State.

Following is a list of some of the committee chairmen whom you may wish to write to.

Editor of the NEWSLETTER—Myron F. Rosskopf
Teachers College, Columbia University,
New York 27, N. Y.

Program—Carl Munshower
118 Lebanon Road, Hamilton, N. Y.

A PRACTICAL ARITHMETIC - 1869

by
Vera Sanford, State University Teachers College, Oneonta.

Old textbooks in arithmetic are sometimes unexpectedly interesting. You wonder about the author. You read the Preface to learn his hopes and purposes. You look through the book to see how he has carried out his intentions. You check his treatment of certain topics and you find in the verbal problems scraps of information that give you a picture of the times in which the book was written.

Such a book came to me recently. It is the third volume in Appleton's Mathematical Series—**A Practical Arithmetic** by G. P. Quackenbos, LL.D., upon the basis of the works of Geo. R. Perkins, LL.D., D. Appleton and Company, New York, 1869. The Preface is dated 1866 so this is at least a second printing.

George Roberts Perkins (1812-1876) was born in Otsego County, New York. He was self-educated, taught mathematics in Clinton from 1831 to 1838, and was principal of the Utica Academy from 1838 to 1844. In 1844 he became the first professor of mathematics in the New York Normal School now the State College for Teachers at Albany, and was principal of this school from 1848 until 1852 when he resigned to superintend the erection of the Dudley Observatory in Albany. He later took charge of the calculations involved in the consolidation of the various railroad lines between Albany and Buffalo to form the New York Central Railroad. In 1862 he was made a member of the Board of Regents. His textbooks in mathematics and in astromomy, sometimes called the "Perkins Series" had their first editions in the decade from 1840-1850. His arithmetics were:

Higher Arithmetic, 1841

An Elementary Arithmetic . . . serving as an introduction to the **Higher Arithmetic**, 1844

A Primary Arithmetic: combining mental with written exercises introductory to the **Elementary Arithmetic**, 1850.

Each of these was printed in Utica, with various printings elsewhere. D. Appleton & Co. began to print them in 1850.

George Payn Quackenbos (1826-1881) was a native of New York City. He graduated from Columbia at the age of 17, studied law but soon turned to teaching at the Henry Street Grammar School and then later at the Collegiate School, becoming principal of this institution in 1858. His textbooks, advertised by Appleton, include several in Composition, Rhetoric and English Grammar; Histories of the United States, one a Primary History the other a more advanced book; and a **Natural Philosophy.** The first of these appeared in1851. His **Primary Arithmetic,** based on Perkins, was the first of the Appleton Series of Arithmetics

(1863). This was followed by the **Elementary Arithmetic** and the **Practical Arithmetic** (1866). The dates are significant for the **Primary Arithmetic** came out eleven years after Perkins had left his active work as a teacher and school administrator. Quackenbos was gaining a reputation as may be judged by the LL.D. which Wesleyan awarded him in 1863.

The Preface to the **Practical Arithmetic** states that "The aim has been to make it comprehensive, clear, free from verbiage in its definitions and explanations, inductive in its development of the subject, and well adapted to the schoolroom. . . the author has not laid down rules arbitrarily, but shown the reasons for them by means of preliminary analyses. He has also placed occasional questions or suggestions after examples in the belief that such hints, starting the learner in the right direction, would encourage him to attempt the solution for himself, rather than apply for aid to his teacher,—a practice as destructive of self-reliance in the one as it is annoying to the other. . . . The great distinguishing feature of this book is that it is adapted to the present state of things. The last five years have been five years of financial changes; specie payments have been suspended, prices have doubled, the tariff has been altered, a national tax levied, &c. . . . Time is too precious to be wasted in learning things wrong, only to unlearn them on entering into active life. Our examples are adapted to the present: the prices given are those of today; the difference between gold and currency is recognized and taught; the ra'es of duties agree with the present tariff; the mode of computing the national income tax is explained; a full description is given of the different classes of United States securities, with examples to show the comparative results of investments in them. These are matters that children, as well as adults, ought to know and understand."

Dr. Quackenbos carefully explains borrowing in subtraction and then passes to the "Borrowing and Carrying" method (our equal additions) with this comment "Instead of taking 1 from the upper figure, it is usual to add 1 to the figure below it, which is more convenient, while it gives the same result. . . . This adding of 10 to the upper figure is called Borrowing: adding 1 to the next lower figure is called Carrying. . . . We may have to borrow and carry several times in succession."

In dividing by fractions, the author recalls the fact that dividing the numeral or multiplying the denominator by any number divides a fraction by that number. Thus to find how many times $2/7$ is contained in $3/5$, he says that $1/7$ is contained 7 times in 1. In $3/5$ it is contained $3/5$ of 7 times or $21/5$. But since $2/7$ is twice as great as $1/7$, $2/7$ is contained in $3/5$ only *half as many times* as $1/7$ or $21/10$ times. "Now, what have we done to the dividend $3/5$ to produce the quotient $21/10$? We have multiplied it by the divisor inverted. Hence the rule:- Multiply the dividend by the divisor inverted."

The reference to the National Income Tax seemed an anachronism. The tax stated as 5% on net profits or income with an exemption of $1000. There was also a tax of 5c. an ounce on silver plate, 50c. an ounce on gold plate, a graduated tax on carriages and gold watches and $10.00 on billiard tables. This income tax was a Civil War measure first levied in 1862 and abandoned in 1872. Another income tax, proposed in 1893,

was declared unconstitutional in 1895, a decision that was reversed by the 16th Amendment in 1913.

The situation in regard to United States securities was complicated. Some bonds specified interest in gold, some in currency or lawful money. The rates varied, so did the number of years within which the bonds were callable. U.S. 5-20's were bonds callable from 5 to 20 years paying interest at 6% in gold. The students were asked to compute the price of a bond that would allow the investor to realize 7% on the investment when gold stands at 130. What must gold sell for if U.S. 5-20 bonds bought at 105 are to bring in 8% in lawful money? Which is the better of two investments U.S. 5-20's at 104, gold being at 125 or Virginia 6's at 70?

Rates for life insurance "differ but little in different companies, being based on the Expectation of Life as shown by statistics." This was timely. The insurance companies had used a set of English tables compiled in 1837, but in 1868 the American Experience Mortality Tables were issued. The problem was definitely in the air.

The Metric System is treated in the last chapter of the book and one suspects that it was put in because the act authorizing its use in the United States was passed in 1866, the year the book was first published.

As for the problem material, a grocer's quart measure is too small by half a gill. How much did he dishonestly make by selling four barrels of cider averaging 34 gal. 2 qt. 1 pt. each if the cider was worth 24c. a gallon. The answer is $2.216. Standard Time did not exist. "When it is 10 minutes past 6 o'clock at Chicago, it is 22 minutes 43 sec. past 6 at Cincinnati. What is the difference in longitude between the two places? Moral lessons appear. How much money will a man waste on "segars" at 4½c. each if he smokes 4 a day for 50 years? A man could have bought 1460 books at $1.50 each if he had given up drinking two ten cent glasses of liquor daily for 30 years. C and D retire at the same time, but C rises at ¼ before 6 and D at half past 7. In 1864 and 1865 C has 1279¼ more working hours than D.

With a slight addition, the last paragraph of Dr. Quackenbos's Preface is appropriate. . . . "It is hoped that these, with other features that will be obvious on examination but need not be mentioned here, may commend the work (and others of previous gnerations) to teachers generally."

"21" TRICK
Walter V. Anderson, Babylon High School, Babylon.

Here is a mathematical explanation of an old card trick, and an illustration that in some ways of counting, a mechanical operation can give a fraction the force of 1. There are many variations of the trick. In its standard form the magician deals three cards face up from left to right, then three more just covering the bottoms of these, and continues until there are three columns of seven cards each. A spectator mentally selects a card from these and tells what column it is in. Each column is gathered in a heap face up; that containing the selected card is placed on either of the others; the third on top of these. Thus, the selected card is in a column-heap between the other two. Turn these cards over, and repeat the same procedure twice more. When the 21 cards from the last deal are placed face down, the eleventh card from the top will always be the selected card.

The mathematical formulas for this trick are

$$\frac{a + B}{c} = d + \frac{e}{c} = b, \qquad b + a = k$$

where,
a represents the number of cards in each column
B represents the number of the position in the column of the selected card
c represents the number of columns
d represents the whole part of a mixed number
$\frac{e}{c}$ represents the fractional part of the mixed number
b represents the number of the position in the column of the selected card **on the next deal**
k represents the number to count from the top of the deck to produce the selected card

The values of the letters in the "21" Trick as described in this paper are a = 7; B = 1, 2, 3, 4, 5, 6, or 7; c = 3. Substituting these values in the formulas, you obtain the table,

$$B = 1; \quad \frac{7+1}{3} = \frac{8}{3} = 2 + \frac{2}{3}; \text{ therefore, } b = 3$$

$$B = 2; \quad \frac{7+2}{3} = \frac{9}{3} = 3 + 0; \text{ therefore, } b = 3$$

$$B = 3; \quad \frac{7+3}{3} = \frac{10}{3} = 3 + \frac{1}{3}; \text{ therefore, } b = 4$$

$$B = 4; \quad \frac{7+4}{3} = \frac{11}{3} = 3 + \frac{2}{3}; \text{ therefore, } b = 4;$$

$$k = b + a = 4 + 7 = 11$$

$$B = 5; \quad \frac{7+5}{3} = \frac{12}{3} = 4 + 0; \text{ therefore, } b = 4$$

$$B = 6; \quad \frac{7+6}{3} = \frac{13}{3} = 4 + \frac{1}{3}; \text{ therefore, } b = 5$$

$$B = 7; \quad \frac{7+7}{3} = \frac{14}{3} = 4 + \frac{2}{3}; \text{ therefore, } b = 5$$

Notice that in expressions like 2 + 2/3 and 4 + 1/3, the fractions have the force of 1. Because the column-heap with the selected card is always in the middle, there is one column-heap on top of it. This mechanical action gives the fraction a counting force of 1 unit in the formulas.

If two column-heaps are placed on top of the column-heap of the selected card, a must be multiplied by 2, and so on.

There follows an analysis of the working of the card trick. If B represents the number of the 3rd, 4th, or 5th position in the column of the selected card, b will be 4 on the next deal and also 4 on the next two deals. If B represents the number of the 1st or 2nd position in the column, b will be 3 on the first next deal but 4 on the second and third deals. If B represents the number of the 6th or 7th position in the column, b will be 5 on the next deal and 4 on the two succeeding deals. In any case, in two deals the card selected by a spectator is in position 4 of its column-

heap. Therefore, when the cards are gathered into a deck, the selected card must be eleventh from the top. Three deals are used to make the trick more confusing, hence, more mystifying to the spectator.

There are many ways you can vary this trick. Try any of the following: (a) 3 columns with 5 in each column; (b) 4 columns with 5 in each; selected card column-heap with one column-heap on top; (c) 3 columns with 8 in each; k has two values; (d) 3 columns with 9 in each; k has 3 values; (e) 4 columns with 6 in each; selected card column-heap with one column-heap on top; (f) 4 columns with 6 in each; selected card column-heap with 2 column-heaps on top; in this case multiply a by 2.

The selected card may be in the key position on the first deal as well as on some later deal. The minimum number of deals to get the selected card in the key position can be found by inspection of the table of values constructed by using the formulas.

THE HINDU METHOD REDISCOVERED

Ambrose L. Clarke, Batavia High School, Batavia.

In developing methods for solving quadratic equations, we usually begin with simple incomplete quadratic equations like $X^2 = 36$, $2X^2 = 98$, and so on. Then, we consider more complicated expressions and try to change them so that they are perfect squares. This we do in order to use the same method of solution as before. Of course, such a procedure leads to the trinomial squares and the method of completing the square. Before any rule of procedure is established, it is advisable to let the class try to work out a method of solving equations like $X^2 + 4X = 5$ and $2X^2 - 7X - 15 = 0$. Student discussion can be used to discover the means of eliminating the difficulty caused by the coefficient 2 in the second example.

After some practice in completing the square, it is logical to suggest that a formula may be developed by solving a complete quadratic equation with literal coefficients. This year events took a new turn in one of my intermediate algebra classes. When the general quadratic equation was written in the form $ax^2 + bx = -c$, we compared it, as we had frequently done in the past, with the perfect square $a^2 + 2ab + b^2$. At this point, two suggestions were made; one was to divide the equation by a; the other was to multiply both members of the equation by a. The first suggestion is familiar to everyone. To the surprise of the class, the second suggestion made completing the square easier. While the class admired its discovery, the teacher asked if anyone could suggest further improvements. Someone thought we might multiply each member of the equation by 4, after the form $a^2X^2 + abx + b^2/4 = b^2/4 - ac$ had been obtained; then an equation free of fractions would result. So, of course, we tried this procedure. To the delight of the class, the solution was even easier than using the previous two methods. A review of our work led to combining the two suggestions into multiplication by 4a. So, in one classroom in 1954, the Hindu method of solving a quadratic equation was rediscovered!

Mathematics Tournament at Manlius

Pauline Morris, High School, Geneva.

The second annual mathematics tournament for students in grades 9—12 was held at the Manlius School, May 15, 1954. Again the students enjoyed the fun and competition and are looking forward to May 1955.

Over 500 students from more than 60 schools participated. Exceptional ability and achievement were required of those students who won prizes. This year Ithaca High School captured five of the twelve places and three honorable mentions; the total of eight prizes won for this school first place in the tournament. New Hartford Central School was second with two places and three honorable mentions. About one-third of the schools participating had at least one place or honorable mention.

The tournament day is fun for teachers, too. A tea was held in the Faculty Club House; that time affords a good opportunity to talk with neighboring mathematics teachers and to meet new and old friends.

There is much hard work connected with a tournament of this sort. Much credit is due Paul Hanson, his associates in the mathematics department, and the cadets of the Manlius School for making the day possible. It was a day enjoyed by students and teachers alike.

Following is a list of winners at the Second Anual Mathematics Tournament, The Manlius School. Congratulations to the winners, the schools they represent, and to their mathematics teachers.

NINTH GRADE

First: David Kresge, Ithaca High School
Second: Marian Griffiths, Ithaca High School
Third: John Swanson, Mt. Upton Central School
Hon. Mention: George Blomgren, Ithaca High School; Nancy Wenner, New Hartford Central School; Malcolm Gifford, Whitesboro Central School; Carolyn Gifford, Gorham Central School; Thomas Frantz, Cazenovia Central School

TENTH GRADE

First: Bruce Layton, Ithaca High School
Second: Elinor Bradt, New Hartford Central School
Third: Robert Patrick, Most Holy Rosary H.S., Syracuse
Hon. Mention: Ronald Hatcher, New Hartford Central School; Gayl Kelts, Vernon-Verona-Sherrill Central; Daniel Leary, Port Byron Central School; Ann Roberts, New Hartford Central School; Leigh Fitchen, Hamilton High School

ELEVENTH GRADE

First: Richard Wenner, New Hartford Central School
Second: Thomas Wirth, Nottingham H.S., Syracuse
Third: James Mahoney, Christian Brothers Acad., Syracuse
Hon. Mention: Dave Randall, Watertown High School; Jamieson Keister, Baldwinsville Central School; William Peck, Geneva High School; Electa Curtis, Morrisville-Eaton Central School; James Robinson, Fulton High School

TWELFTH GRADE

First: John Mineka, Ithaca High School
Second: John Smith, Ithaca High School
Third: Gordon Hanson, Central H.S., Syracuse
Hon. Mention: Howard Bell, Greenville Central School; Douglass Lee, Ithaca High School; Nancy Kelts, Vernon-Verona-Sherrill Central; David Mitchell, Fulton High School; William Edie, Ithaca High School

WHAT DO YOU THINK?

Editor's Comment. In this section there will appear from time to time opinions of the members, the officers of AMTNYS, or committees that are

seeking guidance. An additional service of this section of the NEWSLETTER will be to print short papers of contributors on particular topics in mathematics.

The Editorial Board invites all of the membership to contribute. Here is an opportunity for you to air your points of view, to engage in discussion with other mathematics teachers.

Muriel Weber, Islip High School, Islip

There is a great lack of fundamental mathematics mastery found in students coming into junior high school from the sixth grade. No uniformity in these students' ability to handle operations in arithmetic exists. Too many students, regardless of their knowledge or lack of knowledge of mathematics are passed to the next grade in elementary school and to the next grade. The result is that students entering the seventh grade are deficient in operations with common fractions, decimal fractions and mixed decimal numbers, and percentages.

Many of the seventh graders know how to work correctly in arithmetic, but they seem to lack the desire to be accurate or an appreciation of the values to be gained from accurate work. So many of them are below grade level in reading that any sort of book problem is too much reading for them.

In order to graduate from junior high school, all that is necessary is that a student have an average grade that is satisfactory. This means that some students are passed into senior high school with extremely weak work in mathematics and in other subjects. Many such students, who are passed along with their age groups to senior high schools, become discipline cases because they cannot understand the work that a class is supposed to be doing. Even if the subject matter has been watered down so that it is thought such a student will be able to master it, a busy teacher finds it well-nigh impossible to motivate the student to study and to work enough to earn a passing grade.

If these students appear in courses where there are average and above average students, the latter are harmed because the teacher must spend so much time on discipline that she has no time to teach. In the new tenth year geometry course emphasis is placed on originals and problems rather than on memorizing theorems. It is granted that this is sounder teaching of mathematics, but does this mean that we shall have more failures? Can we afford more failures?

Editor's Comment. This is the first entry in the new section of the NEWSLETTER. Some of you will want to write on this same subject. Send your comments to the editor; they will be printed as space allows.

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TREASURER'S REPORT
ASSOCIATION OF MATHEMATICS TEACHERS OF NEW YORK STATE

Balance June 29, 1953 ....$	723.34	
RECEIPTS:		
Membership dues, 1953-54......	560.40	
Membership dues, 1954-55......	448.50	
Book Exhibit, Syracuse, 1954	200.00	
Luncheon reservations, Syracuse, 1954	665.50	
Sale Educational Supplement	6.00	
Total receipts		$ 2,603.74
DISBURSEMENTS:		
Luncheon, Hotel Syracuse, 1954... ....$	660.00	
Reception, Hotel Syracuse, '54	60.00	
Rental Book Exhibit Space and tip, Hotel Syracuse, '54	50.00	
P.A. system and TV. Hotel Syracuse	38.00	
Meeting rooms, Hotel Syracuse	28.50	
Luncheon refunds	5.50	
Book exhibit refund	7.50	
Postage and envelopes	355.97	
Office supplies and stationery	96.65	
Secretarial and clerical	26.95	
Paper	34.95	
Printing	435.81	
Miscellaneous	4.83	
Total disbursements	$1,804.46	
Balance July 1, 1954 ....$	799.28	

                    Theresa L. Podmele, Treasurer.

NEWS NOTES
Membership chairman Theresa L. Podmele re-
ported that the total stood at 565 in September.
Now that schools have opened again and all teach-
ers have returned to their posts, it is time to inter-
est all your colleagues in joining AMTNYS. Miss
Podmele has furnished membership blanks to all
County Chairmen. In case more blanks are needed,
write to her at 356 Lisbon Ave., Buffalo 15.

The Nominations Committee is beginning its
work. Robert Rowley as chairman is asking each
one of his commttee to submit suggestions. In ad-
dition he should like to hear from more members
concerning nominations for positions on the slate
next May at the annual meeting. The addresses
and names of the committee are given in this issue
of the NEWSLETTER. When you write to any
one of the committee members a suggestion, be
sure to include the following information: (a) the
position for which you suggest the person; (b) the
school and address of the person; (c) an indication
of your reasons for nominating the person. The
foregoing data helps the committee to make its
decisions.

The editor of the NEWSLETTER needs ma-
terial for publication. Unsolicited manuscripts are
most welcome. Remember there is a new section
where even a very short paper can find a place.
Write to us. What sort of paper do you like to see
in the NEWSLETTER? Are there any areas that
we are neglecting? Let us have your reactions;
that is the only way in which improvements can be
made.

In preparing a manuscript for the NEWS-
LETTER it would be most helpful if you would
type your paper, leaving wide margins on both
sides. If you set a typewriter so that there are
68 characters to the line, the editors are assisted
in judging the amount of copy that they have.
However, many of you do not have access to
typewriters. Do not let this deter you from writ-
ing; we can have some papers that are presented
for publication typed. On the other hand, if you
do type, please type your papers carefully!

The NEWSLETTER is being subjected to crit-
ical examination continually. There is a move-
ment under way to change the title of our publica-
tion and to change the format. What are **your**
suggestions for a title? If we change the format,
the size of our publication will be reduced to that
of half a sheet of typewriter paper and will consist
of 16 pages. What do you think of this suggestion?

Officers of the Association of Mathematics Teachers of New York State

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Bulletin of the Kansas
Association of Teachers of Mathematics

Devoted to the Interests of Mathematics in the Secondary Schools of Kansas

CONTENTS

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ALGEBRA AND TRIGONOMETRY FOR THE GIFTED STUDENTS AT THE IOWA STATE COLLEGE*

FRED ROBERTSON, *Iowa State College, Ames, Iowa*

In the early part of 1952, a change was made in the procedure in assigning students to classes in algebra and trigonometry. This exposition explains the procedure used to select and instruct the gifted students in those subjects as well as some results obtained.

The students accelerated in mathematics in two ways: by passing algebra or trigonometry or both by an examination, or by meeting certain requirements to enter an accelerated one-quarter course in combined algebra and trigonometry.

In the fall quarter advanced standing examinations are given during freshman week. They are equivalent to the final examinations given in each course. The students who make scores of A or B are granted credit in their curricula for these courses with the grade made on the examination. Other institutions of higher learning in Iowa have also accepted the results of these examinations as proof of proficiency in these subjects.

This study concerns only those students who elected the accelerated course.

During freshman week our testing bureau gives a series of examinations. Of these the American Council on Education (ACE) and the mathematics placement examination results were used in the study.

The testing bureau gives us a report on the basic scholastic achievements of each freshman or transfer student before fall classes start. From this report the ACE total score, the mathematics placement score, both measured in percentiles, and the high school average with maximum grade point value of four were used.

On the second Friday of the quarter, or usually the eighth day, a uniform departmental examination was given and a frequency distribution chart constructed.

In order to qualify for the accelerated section, the student must have met all of the following requirements:

1. Had a course in trigonometry
2. Had four semesters of high school algebra
3. Be in the upper 20 per cent of the freshman class in *all* of the following
   a. ACE (total)
   b. Mathematics placement
   c. Mathematics departmental
   d. High school average
4. Have a recommendation from his instructor
5. Must have permission of the committee in charge if *all* requirements specified in 3 were not *fully* met.

Immediately after the results of the departmental examination were known, the committee met to select the students who met the requirements for the accelerated program.

The mechanics of selection were as follows: Each instructor completed a data sheet for each class. A sample form is shown below.

The columns at the right were reserved for recording the grades in the sequential mathematics courses.

From these data sheets the committee acted on the recommendations of the instructors and selected the names of the candidates to be invited *to* the accelerated sections.

Name	ACE Total	Math. Place	H.S. Ave.	Depart. Exam	H.S.	Recommendation			

Program

Joint Meeting of K.A.T.M. and Kansas Section of M.A.A.

Baker University, Baldwin, Kansas
Saturday, March 27, 1954

REGISTRATION
9:15–10:00 a.m., Parmenter Commons

MORNING SESSION
10:00 a.m., Memorial Hall Auditorium
Calvin Foreman, Presiding

I. *Archimedes and Integration*, S. H. Gould, University of Kansas

II. *Recent Trends in Mathematics*, Martin Goland, Midwest Research Institute

III. Business Session of K.A.T.M., W. V. Unruh, Presiding

12:15 p.m. **Luncheon**, Fellowship Hall, Methodist Church
Fifty Years: Then and Now, W. H. Garrett, Baker University

AFTERNOON SESSIONS
Kansas Association of Teachers of Mathematics
2:00 p.m., Elsie Allen Hall, Parmenter Commons
V. W. Unruh, Presiding

I. *An Examination of the Mathematics Curriculum and its Application to Industry*, Dr. Luke, Midwest Research Institute

II. Topics: *This Is How I Do It*
1. *How I Establish Rapport in My Geometry Classes*, Laura K. Neville, Wichita East High School
2. *This Is How I Teach a Shortcut in Multiplication*, Arthur Peters, Olathe High School
3. *This Is How I Try to Teach History of Mathematics*, Esther S. Kingman, Topeka High School
4. (Subject to be Announced), R. L. Goering, Salina High School
5. (Subject to be Announced), C. V. Whitney, Shawnee Mission High School

Kansas Section of the Mathematical Association of America
2:00 p.m., Mulvane Hall of Science, Room 11
Calvin Foreman, Presiding

I. *On n Consecutive Integers*, Stanley Gale, University of Kansas

II. *Mathematical Analysis of Music*, Professor Herman Reichenbach, Sterling College

III. *Some Indeterminate Forms*, S. T. Parker, Kansas State College

IV. *Report on the Boulder Conference*, Paul Eberhart, Washburn University; Reverend Wm. C. Doyle, Rockhurst College

V. Business Session

TABLE I
Records of Accelerated Sections of Two Years

	ACE	Math. Place.	H.S. Ave.	8 day	Alg.	Trig.	All Col. 1st. Qtr.	Anal.	Cal. I
Acc. Sec. 1952	87.7	88	3.42	36	3.43	3.28	3.11	2.66	2.81
Acc. Sec. 1953	87.3	90.6	3.53	37	3.58				
Upper 10% Scholastically	89	84	3.48						
All Freshmen in Math. 1952	50	50	2.79	26.2	2.22	2.47	2.19		

(Continued from page 18)

On the Monday following the departmental examination on Friday, each instructor explained the program to each successful candidate in his class and invited each one to participate in the accelerated program. The results of the interviews were reported to the committee promptly.

One hundred and twenty-five of the original 1004 students in college algebra accepted the invitation and were placed in six sections on Tuesday.

At this point it should be noted that the activation of these classes were made easier in the following way. In the spring, the general scheduling committee followed the departmental recommendation for many sections (seven to nine) of college algebra at each hour. Thus, generally, each member of the accelerated sections could take mathematics at the same hour he was scheduled for college algebra. In the exceptional cases, it was found that the students could enter the 12:00 class. In this way all schedule changes were held within the mathematics department.

To initiate the program six instructors were assigned to the sections. They all agreed that each student was expected to spend the usual time (two hours) in preparation for each daily assignment. The final grade in each course was to be computed by giving a high weight to achievement as evidenced by standard objective tests. Emphasis was placed on the fact that there would be no excessive amount of daily preparation expected and there would be no down grading.

The accelerated sections completed the algebra in five weeks and were given credit for that course.

At this time the mid-term grades were available and were checked to see that each student was doing satisfactory work in all of his subjects. Anyone not meeting this requirement would be requested to defer taking trigonometry until the winter quarter. All of the accelerated group met this requirement.

The following tables give some data on the group as they started the course and the results as available to date.

The data in Table I are interpreted as follows: For the accelerated group in 1952, the average percentile on the ACE was 87.7. The upper 10 per cent scholastically was equal to or above the 89.0 percentile.

The accelerated group had an average percentile of 88 in mathematics placement scores while the upper 10 per cent scholastically was equal to or above the 84th percentile.

The last columns in Table I include the grade point average for each group in the particular course.

TABLE II
Comparison of Accelerated and Remaining Group Achievement in College Algebra

	ACE	Math. Place.	H.S. Ave.	8 day
A Accelerated	88.4	88.6	3.58	36.9
Normal	73.6	80.7	3.26	33.8
B Accelerated	87.7	85.	3.42	35.3
Normal	74.	69.8	3.15	31.2
C Accelerated	80.5	76.5	3.29	33.5
Normal	61.1	55.7	2.84	26.2
D Normal	59.9	37.2	2.63	22.4
F Normal	53.2	39.6	2.55	19.7
Drop Normal	66.2	45.8	2.67	23.8

The first column in Table II shows the letter grade obtained in college algebra. The second column shows whether it was the accelerated group or the normal group. By the normal group is meant those students taking college algebra who were not in the accelerated sections.

The high school average of the students in the accelerated sections who made A in college algebra was 3.58 while for the normal group it was 3.26.

Table III shows the first quarter all-college grade-point average of the 125 students who took college algebra and trigonometry in the fall quarter of 1952. It should be emphasized these students were carrying 5 hours above a normal schedule.

TABLE III
First Quarter All-College Average of 1952 Accelerated Group

Grade point	Number	Cumulative	
4.0	4		
3.9	5		
3.8	9		
3.7	3		
3.6	6	27	
3.5	5		
3.4	11		Av. 3.1+
3.3	3	46	
3.2	16		Mode 3.2
3.1	8	70	
			Median 3.2
3.0	8	78	
2.9	7		
2.8	11	96	
2.7	5		
2.6	9	110	
2.5	3		
2.4	6		
2.3	1		
2.2	2		
2.1	0		
2.0	3		
	125		

The table shows 32, or more than 25%, made an all college, first quarter average of 3.5 or better. Also 78, or more than 62%, made 3.0 or better; and 110, or 88%, made above 2.5 grade point average.

The table reads that of all the students rated in the percentile range 91–100 only 93 per cent made an all-college first quarter grade point average above 1.99. All of the accelerated group made such an average.

The preceding discussion shows the accelerated group did well in all of their college work the first quarter and did especially well in mathematics. The same procedure was used in the fall of 1953.

TABLE IV
Comparison of All-College Records of Normal and Accelerated Groups with Similar ACE Scores
Percentage of students making above 1.99 for the first quarter

ACE %	Normal Group %	Accelerated Group %
91–100	93	100
81– 90	87	100
71– 80	76	100
61– 70	71	
51– 60	62	
41– 50	60	
31– 40	47	
21– 30	44	
11– 20	40	
1– 10	29	

DEVELOPING MATHEMATICAL LITERACY

Some Additional Units from the Nebraska Study

MEASUREMENT—NATURE, UNITS, AND SYSTEMS

This unit is designed to emphasize competencies 9, 10, 18, and 19.

Objectives
1. To develop an understanding of the nature of measurement.
2. To develop skill in the use of measuring devices.
3. To develop an understanding of units of measurement.

Content
1. Story of the development of units of measurement.
2. Use of various measuring devices employing both the English and metric systems. Conversion from one system to the other. Conversion of derived units to fundamental units.
3. Meanings of terms used in measurement.

Learning Activities and Techniques
1. Discuss the development of various units of measurement; the foot, digit, cubit, span, etc.
2. Measure length, area, and volume of objects with a ruler or meter stick, a vernier caliper, and a micrometer. Use both the metric and English systems in measurement, and convert from one system to the other.
   a. Compare the yard stick and meter stick.
   b. Measure weights of objects in grams and ounces.

c. Discuss the relationship between units of time; the second, minute, hour, etc.

d. Discuss units of angular measurement.

e. Discuss Centigrade and Fahrenheit temperature scales.

f. Show that derived units can be converted to the fundamental units, mass, length, and time.

3. Show that measurements are approximations and not exact.

a. Discuss tolerance, error, precision, and accuracy as used in science, machine work, and tool making.

Sources of Information

Ford Motor Co., Education Dept., Dearborn, Mich. "How Long is a Rod?" Free leaflet. This is an illustrated historical review of the measurement of length.

Lufkin Rule Co., Saginaw, Mich. "This Amazing Story of Measurement." $.10. This is in comic book form.

Pratt and Whitney, Hartford, Connecticut. Several free pamphlets on precision measurement.

Schorling, Raleigh, and Clark, John R. *Mathematics in Life*, World Book Co., Yonkers, N. Y. Unit I: "This Age of Precision." Unit II: "Practical Applications of Decimals."

Freilick, Julius, Berman, Simon L. and Johnson, Elsie, *Algebra for Problem Solving, Book I*. Houghton, Mifflin Co., New York, 1952. pp. 136-139. This book contains an excellent presentation of the Centigrade and Fahrenheit temperature scales.

Journal of Calendar Reform, The World Calendar Association, Inc., International Bldg., 630 Fifth Ave., New York 20, N.Y.

THE PYTHAGOREAN THEOREM

This unit is designed to emphasize competencies 11 and 14.

Objectives

1. To develop an understanding of squares and square roots.

2. To develop the ability to find squares and square roots from tables.

3. To develop the ability to obtain approximate square roots by the trial division method.

4. To develop the ability to extract square roots by computation. (Optional).

5. To develop an understanding of, and the ability to apply, the Pythagorean relationship.

Content

1. Squares and Square Roots
   a. Meaning of squares and square roots
   b. Tables of squares and square roots
      (1) Squares and square roots of perfect squares
      (2) Interpolation of tables
   c. Approximation of square roots by the trial division method.
   d. Extraction of square roots by computation (Optional).

2. Pythagorean relationship
   a. The meaning of the Pythagorean relationship
   b. Applications of the Pythagorean relationship

Learning Activities and Techniques

1. Point out that a square number is the product of a number multiplied by itself. You may portray this square number as representing the area of a square whose length of sides is this number. Show that the square root of a number is the length of a side of this square.

2. Explain the use of a table of squares and square roots. Give practice exercises on using this table.

3. Explain the method of approximating square roots by the interpolation of the table. Suppose you want the square root of 266. 266 lies between 256 (16^2) and 289 (17^2). 10/33 to the nearest tenth is 0.3. The square root is approximately 16.3. Give practice exercises on approximating square roots by interpolation.

4. Explain the method of obtaining approximate square roots by trial division. Suppose you want the square root of 113. The square root lies between 10 and 11. If you divide 113 by 10, the quotient is 11.3 correct to tenths. The average of the divisor 10 and the quotient 11.3 is 10.6 which is a satisfactory approximation. If greater accuracy is desired, divide 113 by 10.6 and average the quotient and divisor. Continue this procedure until the desired accuracy is obtained. Give practice exercises on obtaining approximate square roots by trial division.

5. Explain the traditional method of extracting square roots by computation. Give practice exercises on extracting square roots.

6. Distribute squared paper and have pupils draw a right triangle two of whose sides are 3 and 4 units long respectively. Measure the hypotenuse with a strip of paper. Repeat this experiment with triangles whose legs are 6, 8; 5, 12; etc. Introduce the symbols a and b for the leg lengths and c for the hypotenuse; record experimental results in a table. Following this exercise, use squared paper to represent squares on the legs and a square (cut out) on the hypotenuse. The number of unit squares in the square area on each side may now be counted and the sum of the areas on the legs compared with the area on the hypotenuse. Record these results in a second table. You may now formulate the rule, $a^2+b^2=c^2$.

7. Using the Pythagorean relationship compute the hypotenuse when we know the leg lengths. Apply to problems of indirect measurement, e.g., "Find the distance between second base and home if

each side of a baseball diamond is 90 feet." Now use exercises which require the finding of the length of a leg if the hypotenuse and the other leg are known.

8. Give practical illustrations of the use of the Pythagorean relationship, e.g., the carpenters' use of the 6, 8, 10 relationship to check the squareness of corners.

Sources of Information

Helpful teaching suggestions, explanations, and exercises on square roots, squares, and the Pythagorean relationship may be found in most algebra, general mathematics, and geometry textbooks.

ANGLES AND GEOMETRIC CONCEPTS

This unit is designed to emphasize competencies 12 and 13.

Objectives

1. To develop a basic understanding of geometric facts and figures.
2. To develop an understanding of the simplest properties of geometric forms which the student encounters every day.
3. To develop skills in applying the relationships between geometric forms and function.
4. To create an awareness and appreciation of geometric figures and symmetry in nature.

Content

1. A knowledge of estimating, reading and constructing angles: acute, obtuse, right, and straight.
2. A knowledge of geometric terms and figures:
   a. Point, line segment, parallel lines, perpendiculars, circle, prism, cylinder, cone, sphere, trapezoid, and regular polygon.
   b. Triangles: right, scalene, isosceles, and equilateral.
   c. Parallelogram: square, rectangle (rhombus optional).

Learning Activities and Techniques

1. Find geometrical forms in architecture, landscapes, insignia, flags, trademarks, automobiles, aircraft, church windows, modern art, clothing, etc. (Students should be encouraged to bring in all types of pictures from magazines and newspapers that illustrate these forms. After grouping according to the geometric figure represented, bulletin board displays can be prepared from the best selections in each group.)
2. Such suggested group headings might be: "Geometry in Aircraft"; "Geometry in Automobiles"; "Geometry in Gasoline Signs", and the like.
3. On each mounting of group pictures, draw the basic design that is represented.
4. These representations should be kept continuous and can be compiled into booklet form.
5. Discuss the part that good taste in design plays in everyday living. Point out

some advantages of geometric forms used by manufacturers to design and advertise their products.

6. Discuss symmetry in nature—what is pleasing to the eye and why. Use illustrations such as honey combs, beehives, bird nests, snowflakes.

Sources of Information

Audio-visual Materials

A. Suggested Film Strips.

Geometry in Art. Distributed for Curriculum Films Inc., by the University Publishing Co., 1126 Q St., Lincoln, Nebraska, $3.95 each. Excellent.

Lines and Angles (Part I and Part II)—Distributed for Curriculum Films Inc., by the University Publishing Co., 1126 Q St., Lincoln, Nebr. Excellent.

Filmstrips one and two are three of a series of 16 filmstrips all pertaining to geometry. The entire series may be purchased for $48.

Basic Angles and Experimental Geometry —SVE Inc., 1345 W. Diversey Parkway, Chicago 14, Ill. 52 frames. $3. Excellent.

Introduction to Circles—SVE Inc., 1345 W. Diversey Parkway, Chicago 14, Ill. 48 frames. $3.00. Very good.

Quadrilaterals—SVE Inc., 1345 W. Diversey Parkway, Chicago 14, Ill. 54 frames. $3.00. Very good.

B. Suggested Films.

Lines and Angles—(12 min.) sound B&W $1.50. University of Nebraska Film Library. Excellent.

Angles—(11 min.)—sound B&W $1.50. University of Nebraska Film Library. Excellent.

Practical Geometry—(10 min.) sound B&W $2.00. Knowledge Builders, 625 Madison Avenue, New York 22, N.Y. Very good.

Other Related Materials.

"General Mathematics in the High School," Mathematics Bulletin No. 2. Curriculum bulletin No. 17, Wisconsin Cooperative Educational Planning Program. Issued by the State Department of Education, Madison, Wisconsin. Free. pp. 18–20.

"Course of Study in Mathematics," Commonwealth of Pennsylvania, Department of Public Instruction, Harrisburg, Pennsylvania. Bulletin No. 360. $1.25. Pages 234–238.

"General Mathematics for the 9th Year," Board of Education of the City of New York. Pages 5–8.

Free and Inexpensive Materials.

Reproduced Chart on Solids taken from the text *Mathematics and Life, Book III*, Hawkins and Tate, Published by Scott, Foresman and Company. Free.

"Light on Growing Children," by Dr. Darrell B. Harmon, Luminall Paints, 3617 S. May St., Chicago 9, Ill. Has a lot of material that pertains to angles and mathematical terms. Free.

"Railroad 'Rithmetic," Book II, the Baltimore & Ohio Railroad Co. Free, Write to:

R. M. Van Sant, Director Public Relations, B. & O. Railroad Co., Room 1202 B. & O. Building, Baltimore 1, Maryland.

TABLES—GRAPHS—STATISTICS

This unit is designed to emphasize competencies 6, 7, and 8

Objectives

1. To develop the ability to collect, organize, and interpret simple data, especially as found in everyday social problems.
2. To develop a clear idea of the meaning of the terms used, such as mean, median, and mode.
3. To develop the idea that a formula can be graphed.

Content

1. Emphasize the interpretation rather than the construction.
2. Choose the type of graph to best fit the data and the purpose.
3. Develop the idea that a formula is a short way of writing a mathematical rule or relation.

Learning Activities and Techniques
Graphs

1. Examine bar graphs, line graphs, circle graphs and pictographs to develop the fact that all graphs have as a principal function the presentation of numerical facts.
2. Collect and display on the bulletin board illustrations of the several kinds of graphs.
3. Construct the various kinds of graphs. Use squared or "graph" paper to construct bar graphs and line graphs. Since the pictograph is not to be a work of art, simple figures, such as stick men, can be used.
4. Display of original graphs.

Tables

1. Read and study tables which contain the facts and information pictured in a graph.
2. Examine time tables, business tables, conversion tables, health tables.

Statistics

1. Collect data for work that is significant to the student.
2. Show that the data can be presented either in table or graph form.

3. Give exercises in which the students must determine the mean, median, and mode.

Formulas

1. Work out tables and draw the graphs of everyday formulas. For example, the interest formula; cost formula; distance formula, both for stopping automobiles and for traveling at a uniform rate of speed.

Sources of Information

1. Railroad, bus, and plane time tables.
2. Income and insurance tables.
3. Daily weather reports.
4. Height and weight charts.
5. Calorie tables.
6. Use students' grades in various subjects; attendance records; family, time, and individual budgets; expenditures of local tax money; sports results, and batting averages; as basis of classwork in collecting and presenting data, either graphically, or statistically.
7. Free and Inexpensive Teaching Aids
American Aviation, 1025 Vermont Ave., N. W., Washington 5, D.C. "Air Transport—Facts and Figures."

Dunn and Bradstreet, Inc., Education Division, N.Y. City. Good bulletin board graphs and charts. Free.

Institute of Life Insurance, Education Division, 60 East 42nd St., N.Y. 17, N.Y. Excellent free graphic material. Catalog available.

United Air Lines, Palmer House, Chicago, Ill. "Air Transport Facts and Figures." Free booklet.

Baltimore and Ohio Railroad Company, Room 1202, Baltimore & Ohio Bldg., Baltimore 1, Maryland. "Railroad 'Rithmetic," Books I & II.

The first issue of the Mathematics Student Journal, a magazine for high school mathematics students, is being well received by mathematics teachers throughout the country. It will be issued four times a year, and the price is 20c per year per copy, in bundles of at least five. Address orders to: National Council of Teachers of Mathematics, 1201 Sixteenth St., N.W., Washington 6, D.C.

INDIANA MATHEMATICS

INDIANA   COUNCIL   OF   MATHEMATICS   TEACHERS

Indiana Council Meets At Purdue

Weather forecast for May 15 is warm and sunny for northern Indiana. We know you will enjoy a nice drive to Purdue University, where we will meet for our annual Indiana Council of Teachers of Mathematics conference. The meetings are to be held in the Union Center (Pictured on this page).

The committees are well at work, planning the program and

CONFERENCES TO COME

March 2, 1954 -- Dinner Meeting of Gary Council of Teachers of Mathematics at YWCA, Gary. No reservations necessary.

April 21-4, 1954 -- National Council of Teachers of Mathematics Convention at Cincinnati, Ohio.

May 15, 1954 -- HOLD FREE! Come to Purdue University!

COMMISSION ACCEPTS OUR CHOICE

Good news at last! All of you know by now that things turned out for the better for us this year. The Textbook Commission has granted us our top three choices. I don't know how it happened; if we knew, it might help us in the future. At any rate, this time we can feel that our work was not used in reverse, as last year. Just in case any of you have not seen the list of adoptions, here they are:

MAKING SURE OF ARITHMETIC,Silver Burdett Co. $1.53 per year
ROW-PETERSON ARITHMETICS, Row- Peterson & Co. $1.56 per year
GROWTH IN ARITHMETIC, World Book Co. $1.59 per year
And they did not split the series, as there was some pressure to have done.

For the future, we would accomplish more by entering into correspondence with the chairmen

THE NATIONAL COUNCIL OF TEACHERS OF MATHEMATICS

The Ohio Council of Teachers of Mathematics and the Mathematics Club of Greater Cincinnati are proud to be the host organizations for the thirty-second annual meeting of the National Council of Teachers of Mathematics to be held in Cincinnati at the Sheraton-Gibson Hotel. An all out effort is being made to make this meeting as stimulating and significant as any ever presented.

One of the highlights of the meeting will be the opportunity for registrants to see and hear actual televised demonstration lessons over WKRC-TV in cooperation with the Cincinnati Board of Education. Sightseeing tours,industrial visits, and school visits will be provided.

President John Mayor, University of Wisconsin,reveals that the meeting will devote a great deal of time to discussions of methods of improving teaching techniques from the primary grades through college. A report on the twenty-second year book will be made by John Clark, editor.

We are particularly pleased that Belmont Farley, NEA Director of Press and Radio Relations has agreed to actively promote the press services of the convention proceedings. He expressed a keen interest in mathematics by stating, "Because I am in daily contact with young people who are using mathematics to find their way in the new world of science we have entered,I have considerable appreciation for what this subject means in our schools today...To me this is a fascinating subject and I think much could be well made of it at a meeting such as the one we are going to have in Cincinnati."

The selection of Cincinnati for the annual meeting was parti-

THE NATIONAL COUNCIL OF MATHEMATICS

(continued from page 1)

cularly fortunate. There are few cities that have such a colorful history. Across its pages have walked Harriet Beecher Stowe, Audubon, McGuffey, Duveneck, and Stephen Collins Foster. It has given statesmen, presidents, musicians, artists, and scientists to national life. There is no household in America that does not come in contact daily with some Cincinnati product, be it soap, yeast, school books, clothing, radios and TV sets, pianos, watches, greeting cards, refrigerators, playing cards, chemicals, pottery and paints. More machine tools are produced in Cincinnati than any place in the world.

The complete program for the meeting will appear in the February issue of The Mathematics Teacher. This issue will also contain registration blanks. If you wish you may write directly to the Sheraton-Gibson Hotel, Cincinnati, Ohio.

Mildred Keiffer, general chairman of the meeting and supervisor of mathematics with the Cincinnati Board of Education, solicits inquiries. She may be addressed at: Cincinnati Board of Education
608 E. McMillan Street
Cincinnati 6, Ohio

Cincinnatians believe the visitors to our city will not only experience Southern charm, but Northern vigor, Eastern officiency and Western friendliness. We are the crossroads of America.
--S. Nankovitch, Chr.
Promotion and Publicity

Indiana Council of Teachers of Mathematics

Seventeenth Annual Meeting, 1953

Minutes of the Meeting of the Board of Directors

The seventeenth annual meeting of the Board of Directors of the Indiana Council of Teachers of Mathematics was called to order by the president, Mrs. Mildred Saltzman, on Friday, May 1, 1953, at 9:00 P.M. The officers and board members present were: president, Mrs. Mildred Saltzman; vice-president, Kenneth Conkling; secretary, Olive G. Wear; treasurer, A. Price Noe; and the following directors from the various areas: J. John Miller, Clarence Buesking, Izelia McWilliams, Paul Gore, Betty Alderton, Grace Arbogast, K. Eileen Beckett (program chairman for State Council), and Philip Peak (State representative of National Council of Teachers of Mathematics).

The treasurer's report which was read and approved, showed a balance of $276.99 as of May 1, 1953.

The secretary gave the following report for the year:

183 members of Indiana Council
104 of these members are also members of the National Council
The total membership for the year shows the following facts:
131 renewals

Editorial Notes

This year I have been fortunate to have willing help. The articles are coming in as scheduled. Articles for this issue have been submitted by Stanley F. Schenck of Goshen High School. The April issue will come from Bosse High School at Evansville.

WHAT ABOUT NEXT YEAR! We stand ready to accept volunteer sponsors for next year's issues. The sponsor sees to it that articles are written in his locality by local people. Will you be a sponsor for October or December of 1954 or perhaps February or April of 1955? Will we hear from you?

Professional distinction of the National Council of Teachers of Mathematics membership is generally recognized. Membership in the national Council of Teachers of Mathematics identifies the teacher as a leader in mathematics education and as one working toward progress in the teaching of mathematics.

Join NOW the Only National Organization that is Devoted to your Interests

35 new members
17 reinstated (had not been regular with payment of dues but had belonged to the State Council in recent years.)

The excellent report of the editor of the News Letter for the years work brought forth many comments of praise. The total bill for the News Letter was $50.56. It was moved by A. Pryce Noe that we extend a vote of appreciation to Olive Leskow for the fine work done by her to make the NewsLetter a real success. She was urged to accept this duty for another year.

Miss Beckett presented a plan for an amendment to the constitution that would bring about a more effective functioning of the executive committee. It was moved that this amendment be presented at the general meeting.

Discussion was held regarding the date for the next annual meeting. It was the opinion that the second week end in May might prove to be more satisfactory than the first week end.

It was agreed that the proposed plan to send a copy of the first issue of the News Letter to all mathematics teachers of the state would serve to interest more people in the work of the State Council.

The president appointed the following as mem-

MOTIVATING MATHEMATICS CLASSES

The Mathematics Club of Goshen High School was organized in 1953 by members of the advanced class and their instructor, Mr. Stanley F. Schenck. The distinctive name chosen for the club was the Euclideans. Officers are Barrett L. Beer, president; Kenneth Brooks, vice-president; Bing Pratt, secretary; and Richard Backus, treasurer. The officers are elected at the end of the first semester, so the club will be well organized when school begins. The members consider this one of the strongest points in the club's constitution.

Membership is open to any student who is continuing in mathematics after completing the first course in algebra. Much of the club meeting time is spent on informative talks on mathematical subjects and mathematical puzzles that are brought in by the students. Our project for this spring is to provide an auditorium program for the school showing that mathematics can be fun and enjoyable. The club has been divided into teams each of which is trying to plan the best program. The entire membership will then choose the team it feels had made the best preparation, and that team will take charge of the program.

One of our outstanding programs was given by two Elkhart High School students, Fred Blackwell and Charles Sims. Both boys are very interested in mathematics and have won silver medals in the State Mathematics Contest. Fred told the members of his work with the binary number system, that is a number system containing only two figures. The processes of addition, subtraction, multiplication, and division were illustrated on the blackboard. Following the "instruction period" the members were given several simple problems in binary to solve.

Charles Sims described his solution of a problem on the 1953 Comprehensive Mathematics Examination involving the gamma function. This problem had proved baffling to students and teachers alike. Charles was one of the few contestants who answered the problem correctly on the test.

The meeting was closed after tasty cookies made in geometrical shapes by Pat Belt and June Wanger were served.

It is the hope of Mr. Schenck as well as the club members that this type of entertainment will stimulate interest in advanced mathematical study.
--Barrett Beer & Bing Pratt
students, Goshen High School

COMMISSION ACCEPTS OUR CHOICE

of the committees, which each member of the Text Commission sets up to study the books and advise him of their findings.

For the third successive year, I now bid goodby, but this time with a distinctly better feeling. I thank every member of my committee for his faithful and careful work, and all members of the Indiana Council for the encouragement to go on. Let us hope that with better relations apparently established, our findings will bear more weight in future years.
--Henry A. Meyer

At Goshen
OUR MATHEMATICS CLASSES

In the early 30's the teachers of mathematics and the administration realized there was a need for some other course of mathematics other than the sequential courses that had been given to all freshmen entering Goshen High School. Many of the students who quit school when they became 16 years old or soon after, were those that had not been successful in their attempt to master the mathematics found in the 'First Course of Algebra'. To be true this was not the only course that had been failed by these students, but it was one which had not given that feeling of success in school. After several sessions of discussions, it was decided to find a course that would satisfy a need these students had, and also give them confidence in mathematics. The course was to be called General Mathematics for it was to be: (1) A reteaching of Arithmetic to those who possibly had been failing in that subject since the third, fourth or fifth grade, (2) An opportunity to learn some mathematics to be use in life by these students who quit and went to work in the store, shop, in the home or on the farm, (3) and the possibility for those who are able, to gain a confidence in their ability in mathematics so that they may take the sequential courses and go on to college.

The next problem was to get those who needed the course to take it, so a program of testing was started in the Junior High School. It had been the custom to give the Stanford Achievement battery of tests about March each year in the Eighth grade, so that was continued, together with the Orleans Prognosis test in Algebra. Most all pupils had had one or two tests to give some picture of their I.Q., so all these tests were compiled on one record. Attention was given to the reading achievement test along with the reasoning and computation achievement on the Stanford Tests and to these were recorded the grades earned in Arithmetic in the Seventh and Eighth grades. With the advice of teachers of the Junior High School, a recommendation was given to the guidance councilors for those students entering High School the next term. If for any reason a student did not wish to take the suggestion, he was not forced to take the course recommended, but during these fifteen years, those who did not follow the advice found themselves out of place. Those who took Algebra when it should have been General Mathematics often failed or found that they had to have much extra help to just get through with a passing grade. Those who took Mathematics when they should have had Algebra, often found themselves bored with the course for it did not offer them a challenge to do their best.

There have been many good results from this course, but the one that is of great help to the community is: most of those who took General Mathematics quit school before they graduated, they got married and started to raise families, these boys and girls are now in the Elementary Schools and they are taking more interest in arithmetic for the parents tell them that it is possible to learn arithmetic and to continue school work on into the High School for the courses there are good for their future life.

Indiana Council of Teachers of Mathematics

bers of the nominating committee: Ralph Virts, chairman,Dwane Small, Nina Martin, and Frank Smith.

Plans were made for a luncheon meeting with Senator Charles Rutledge, to discuss the textbook situation. Members of the Board of Directors were invited.

Meeting adjourned at 10:15 P.M.

Olive G. Wear
Secretary

Seventeenth Annual Meeting, 1953

Minutes of the General Business Meeting

The seventeenth annual meeting of the Indiana Council of Teachers of Mathematics was held at Ball State Teachers College in Muncie,May 1,and 2, 1953. The usual day session was preceded by a dinner meeting, Friday, May 1, in the Ball Room of the Student Center. A joint meeting was held in conjunction with the Mathematical Association of America. Professor R. E. Langer, University of Wisconsin, spoke on the subject "Teaching, a Job or a Profession?".

Morning program
The general session held on the morning of May 2, was also a joint meeting held in conjunction with the Mathematical Association of America. Following a welcome address by Dr. J.R. Emens, a panel discussion "Training the Master Mind"was conducted. Those participating were:Dr. L.W. Ayers, Mr. Philip Peak, Ralph Virts, and Prof. R. E. Langer. Mr. Madison Cawein,consultant for P.R. Mallory and Co., talked on "Mathematics Used in Industry". Mrs. Marie Wilcox reported on the National Council spring meeting.

Afternoon program
A team of four senior boys, Eileen Beckett's students from Lebanon High School, presented the program "Fun in Math". John Horner, consultant from Allison Division of Gen. Motors, talked on Mathematical Analysis of Engineering Problems.

Business Session
The business meeting was called to order at 3:00 P.M. by the President, Mrs. Mildred Saltzman. The minutes of the general meeting held May 3,1952, and the minutes of the meeting of the board of directors held May 1, 1953 were read and approved.

Henry Meyer,chairman of the textbook committee, gave a report of the work for the year. In his opinion the hard work and sincere efforts of this committee had been in vain, in as much as the State Textbook Commission had not considered the recommendations made. The discussion that followed indicated that it might be best to get the recommendations to the commission at an earlier date. This in turn means that the committee needs to be appointed and at work very early in the year. A complete report of this committee is filed in the secretary's book.

OUR MATHEMATICS CLASSES

Almost half of the incoming Freshmen each fall take General Mathematics and ten to twenty per cent of these take Algebra then in the Sophomore year. Occasionally one will continue through the Junior and Senior years in mathematics and then go on to college, and enroll in some engineering course and be successful with it.

About forty per cent of the Sophomores take Plane Geometry and about one-third of these take Advanced Algebra and Solid Geometry. Only a few take Trigonometry and a fourth semester of Algebra in their Senior year.

Goshen High School feels that it is trying to serve the needs of its community in mathematics training.

--Stanley F. Schenck
Goshen High School

Activities of the National Council were reported in brief by Philip Peak. He announced that the summer session would be held at Kalamazoo,Michigan; the December meeting at San Francisco, Calif.; the spring meeting (week after Easter) at Cincinnati, Ohio.

An invitation was extended the Indiana Council by Walter Carnahan to come to Purdue for the next spring meeting. It was moved by Philip Peak that we accept. Motion carried.

The nominating committee presented the following slate of officers for the coming year: president, Kenneth Conkling, Frankton; Vice-president, Olive G. Wear, Fort Wayne; Secretary, Mrs. Eleanor Guyer, Southport; Treasurer, Joseph Kennedy, Greenfield. There were no further nominations. A motion for a unanimous ballot was made and carried.

Eileen Beckett proposed the following amendment to the constitution:

ARTICLE V, Executive Committee. The executive committee shall consist of the officers, the state representative of National Council,and three directors at large.

The directors at large shall be elected for staggered terms and after the first two years, the term of a director shall be for three years. In order to institute the staggered term of office directors chosen this year will have terms as follows: one whose term expires in 1954, one whose term expires in 1955, and one whose term expires in 1956.

The executive committee shall have the

The Learning of Mathematics, Its Theory and Practice

TWENTY-FIRST YEARBOOK OF THE NATIONAL COUNCIL
Price, postpaid, $4.00. To members of the Council, $3.00.

Indiana Council of Teachers of Mathematics

(continued from page 4)

power to transact business, appoint committees, and fill vacancies in office.

Albert Mahin moved that the amendment be accepted. Motion carried. The following people were elected as directors at large: Walter Carnahan, term to expire in 1954; Dale Seider, term to, expire in 1955; K. Eileen Beckett, term to expire in 1956.

Meeting adjourned at 3:45 P.M.

Olive G. Wear
Secretary

GARY COUNCIL INVITES YOU

The Gary Council of Teachers of Mathematics will hold two more meetings before the closing of the school year 1953-54. There will be a dinner meeting at the YWCA, East Sixth Avenue, near Massachusetts Street, at 6:30 P.M. on Tuesday, March 2. Members and guests will go through the cafeteria line and carry their trays to the special dining room which has been set aside for the Gary Council. The speaker will be from the Department of Internal Revenue and will discuss the subject of Taxes. Some questions have been submitted to him for discussion. Come prepared to raise any other question you would like to have discussed. Members An invitation is extended to any teacher of mathematics or any person interested in mathematics living in this locality to attend this discussion.

COMMUNITY RESOURCES IN MATHEMATICS

In this discussion of using community resourses in the teaching of mathematics to junior high school pupils, I do not expect to tell you anything new, but just to review a number of things that have been used. I am quite sure that I am not telling you all the possibilities, but will welcome a discussion at the close of this discussion.

Let us first start with field trips. I have found most industries very cooperative in allowing a group to visit their factory and to guide them through. A conference with personnel who will conduct the trip several days before the time for the trip will give them an idea of purpose of the trip and give them an opportunity to place emphasis upon the mathematics to be found along the route and how it is used. Upon return to the classroom very effective results will be obtained from a discussion of the mathematics found in the various departments and then some practice on the applications of arithmetic needed for the employer and the employee should be used for the next few lessons. I have worked in several of the local factories during the summers of the last 25 years for two purposes. One of those purposes was to increase my annual income as most all teachers are aware that it is very difficult to live twelve months on a poor salary for nine months.The other purpose was to get acquainted with the local conditions in order to make my teaching more effective,and I have brought into my class

work many little problems to show the pupils how the arithmetic they are learning will be used. The banks also are quite willing to conduct classes through their departments and explain some of the mathematics that is used by their employees. Some banks have purchased films explaining certain phases of the banking procedures and are really anxious to loan them for use in the class room. Since many of the students find employment in stores, the department stores usually are ready to conduct trips through their store and explain how certain parts of mathematics are used by the employees. The accounting department of such stores can give many examples of delays caused by errors in recording sales. If there are seed or bulb growers in the community,some very interesting arithmetic problems can be shown on a trip through their rooms and fields.

In some communities the Chamber of Commerce cooperates with the schools in helping to plan visits to the classroom by men of the community who are experts in certain fields and who can teach the pupils how to use some of the arithmetic they have been learning. These visits should be well planned and a conference with the speaker to discuss the ideas to be presented will make the visit very profitable.

--Stanley F. Schenck
Goshen High School

The Slow Learning Pupil

Our high school has pupils entering each year who have achieved discouragingly little in arithmetic. The question we have every semester is: "What shall be the class placement of these pupils?" The following is an account of one such group.

There were twenty-eight pupils in this class, twenty-three who came from the eighth grade in January, 1953,and five who were failures in general mathematics from the previous semester. Their chronological ages varied from fourteen years to seventeen years and three months. Their general intelligence,as measured by the Otis Beta (or Gamma) Group Test, was as follows:

5 C- 's (91 to 95)
1 D 's (80 to 90)

1 E 's (79 or below)

Reading comprehension was low for all of them. At the beginning of the term the Standford Advanced Arithmetic Test, Form E, was given. The scores ranged from a grade achievement of 4.7 to 6.8. It is likely that an intermediate form of the same test would have given a truer, though lower, grade level for some of this group, since the advanced test does not place any student much below the fifth grade.

Learning materials were the workbook, "Growing Up With Arithmetic," Book 6, McCormick-Mathers Company; "Learning to Compute," World Book Company; special sheets prepared locally; and problems selected by the teachers.

Indiana Council Meets At Purdue

activities for a warm friendly meeting. The program will be printed in the April NEWS LETTER. Committees selected for this meeting are:

Program Committee
Philip Peak, Indiana University, Bloomington
Dr. H.E. Fenimore, Central H.S., Muncie
Miss Izelia McWilliams, Horace Mann H.S., Gary
Miss Cleo Orr, New Castle, Indiana
Miss Reitzell, Garfield H.S. Terre Haute

Registration Committee
Mrs. Eleanor Guyer, Southport, Indiana
Mr. Joe Kennedy, Greenfield, Indiana

Hospitality Committee
Mrs. Mildred Luse, Fort Wayne, South Side
Miss Beckett, Lebanon, Indiana
Mr. Donald Fites, West Lafayette H.S.
Miss Della Maude Sanders, Frankfort H.S.

Publicity Committee
Miss Helen Rzepka, Lew Wallace H.S., Gary
Mr. Lee H. Dixon, Kokomo H.S.
Mrs. Gladys Banes McColgin, Tudor Hall School

Exhibits Committee
William Giffel, Michigan City H.S.
Miss Grace Arbogast, Richmond, Indiana
Mr. Everett Smith, Bosse H.S. Evansville
Mrs. Madge Masten, Planefield

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APPLICATION FOR MEMBERSHIP IN THE
Indiana Council of Teachers of Mathematics

Fill out the blank below, and send it with one dollar ($1) to Mrs. Eleanor Guyer, 71 South St. Southport, Indiana

NAME _____
         (Please Print)   First Name   Last Name

SCHOOL ADDRESS _____
         Institution & Address   Title

HOME ADDRESS _____
         Street No.   City Zone No.   State

- -

APPLICATION FOR MEMBERSHIP IN THE
NATIONAL COUNCIL OF TEACHERS OF MATHEMATICS

Fill out the blank below, and send it with three dollars ($3) to THE NATIONAL COUNCIL OF TEACHERS OF MATHEMATICS, 1201 Sixteenth Street, N.W. Washington 6, D.C.

NAME _____
         (Please Print)   First Name   Last Name

SCHOOL ADDRESS _____
         Institution & Address   Title

HOME ADDRESS _____
         Street No.   City Zone No.   State

Place an x in front of the address to which the **Mathematics Teacher** is to be sent.

Please check your field or fields of interest—

( ) Elementary   ( ) Junior High School ( ) High School
( ) Jr. College   ( ) College   ( ) Teacher Training
( ) Supervision   Other _____

The Slow Learning Pupil

At the beginning, group learning and group thinking were used as socializing measures. After class responsibility developed, individual work was started, each pupil working at his own speed under the direction of the teacher. Since the best results seemed to come when the study period was closely supervised, work outside the classroom was not encouraged. No credit was given at the end of the semester.

In June the pupils took Form D of the same standardized arithmetic test. The results showed a steady gain. The range was grades 5.3 to 6.9. The most improvement made by any student was 1.2 years.

During the first semester two pupils withdrew from the class because of illness, but continued their studies with a bedside teacher who used assignments prepared by the regular teacher. In September twenty-one of the group returned to school. Individual work was continued, with occasional class discussions. The better students were supplied with supplementary work, each according to his need, ability and interest.
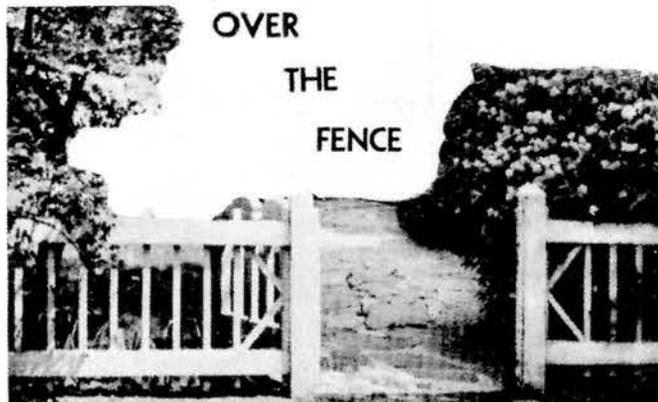
In January, 1953, the nineteen members of the class who remained were given Form F, of the Stanford Test. This time the scores ran from grades 5.6 to 7.7. Seven pupils, who had attained a grade level of 7.0 or over, were given one credit and permitted to go into regular general mathematics 2. The others were advised to drop mathematics for a term or more.

When these pupils first came to this class, most of them had poor work habits, irregular attendence records, little interest in school work, and a general attitude of defeatism. As the group experienced a measure of success in understanding simple mathematical concepts, a greater interest in themselves and in school work developed. Many of them voluntarily spent their study period working in the mathematics classroom. Real appreciation for an opportunity to learn arithmetic at their own level was evident. Attendance became more regular, behavior patterns stabilized, and social adjustment was better. It appeared that some were staying in school who most certainly would have quit had they been in regular class work.

The problem of taking care of the pupils who come to high school but are not ready for any regular course in mathematics is a growing one with us. We are not entirely satisfied with our solution. How are you meeting this situation in your school?
         --Dorothy A. Ridgway
         Central High School
         Fort Wayne

The National Council of Teachers of Mathematics is a National Association organized February 24, 1920, at Cleveland, Ohio, incorporated April 28, 1928, under the laws of the State of Illinois, to assist in promoting the interests of mathematics, especially in the elementary and secondary fields.

OVER THE FENCE

MR. CHARLES L. STUBBS who taught many years at Shortridge then retired about twelve years ago has recently undergone operations for cataracts. He is now at home and is doing well. Writes and reads.

MISS KAREN HUNTER who graduates at Purdue this mid-year will teach at Chalmer, Indiana, beginning about February 1.MISS HUNTER is a native of Logansport.

MR. GEORGE CLINE of Tipton teaches a course in plane geometry which he has organized on his own ideas of sequence and emphasis. He has been working on this for some years and is still making changes as improvements suggest themselves. The chief differences between this course and the traditional course is that he greatly reduces the number of propositions and correspondingly increases the number of exercises. He uses a textbook only for reference and for exercises.

We were happy to have Indiana well represented on the program at the summer meeting of the National Council of Teachers of Mathematics at Kalamazoo, Michigan. The following teachers participated:
EILEEN BECKETT, Lebanon Senior H-S, Lebanon
KENNETH R. CONKLING, Frankton H-S, Frankton
P. D. EDWARDS, Ball State Tchrs College, Muncie
WILLIAM HIGGINS, Ball State Teachers College
GERALDINE KAUFFMAN, Public Schools, East Chicago
OLIVE LESKOW, Tolleston School, Gary
HENRY A. MEYERS, Central H-S, Evansville
PHILIP PEAK, Indiana University, Bloomington
DOROTHY RIDGWAY, Central H-S, Fort Wayne
STANLEY F. SCHENCK, Goshen H-S, Goshen
OLIVE WEAR, Fort Wayne Public Schools, Ft. Wayne
DON WEAVER, Elmhurst H-S, Fort Wayne
MARIE WILCOX, George Washington H-S, Indianapolis

The National Council of Teachers of Mathematics provides for its members a medium for the publication of articles concerning the improvement in the art of teaching mathematics. It welcomes reports from its members giving better methods of presenting any topic in mathematics; thus, it gives its members opportunity to become known in a large professional group.

Members of the National Council of Teachers of Mathematics sponsor National Committees which are constantly working for the cause of more effective mathematics teaching. They are working in the interests of the very members who are supporting them.

THE MATHEMATICS TEACHER can make your teaching easier and more effective.

MATHEMATICS IN OUR SCHOOL

At South Side we offer one year of general mathematics for the slower moving groups of students. This is taken in the freshman year. If a youngster shows promise in this course, and so desires, he may change to algebra after having completed one semester of general mathematics, and thereafter he may take as much mathematics as he desires.

We have three curricula at South Side.

1. The general curricula in which the student usually takes two semesters of general math. He may elect more if he follows the plan stated above -- having completed one or two semesters of general math. One year is required.
2. The business curriculum in which the student may choose either one year of general math or one year of algebra. He may go on with more math if he shows promise, and wants it, provided he has had one year of algebra. The algebra is prerequisite to plane geometry.
3. The college preparatory curriculum in which the pupil is encouraged to take as much math as he can profitably. This is not possible so much in the business course because the business and other requirements do not leave sufficient time for math electives in the junior and senior years.

The college course math sequence is as follows: Algebra 1, Algebra 2, Geometry 1, Geometry 2, Algebra 3, Algebra 4, Trigonometry.

We do not use workbooks in any of our mathematics courses at South Side.

--Paul Sidell
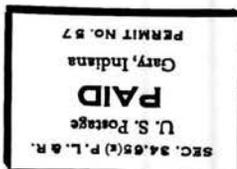South Side High School
Fort Wayne

Central Association of Science and Mathematics

The Central Association of Science and Mathematics Teachers held its annual convention on Nov. 27 and 28 in Chicago. Headquarters for the convention was the Congress Hotel, where all of the meetings were held.

The mathematics section meeting was opened at 10:30 A.M. on Friday by Geraldine Dolan of Cass Technical High School, Detroit,Michigan. Miss Dolan presided over the business meeting, at which time the following section officers were elected for 1954:

Chairman: Reino M. Takala, Hinsdale High School, Hinsdale, Illinois
Vice-chairman: Dwain E. Small, Senior High School, Richmond, Indiana
Secretary: Luther Shetler, Bluffton College Bluffton, Ohio

Dr. Arvid W. Jacobson of Wayne University Computation Laboratory presented a paper entitled "The Role of Mathematics In Our Technologic Culture". Dr. Jacobson pointed out the great need for a good program in mathematics for this scientific age in which we live. He stated that scientific knowledge and research is being advanced by the cooperation

INDIANA COUNCIL OF
TEACHERS OF MATHEMATICS
234 West 49th Ave.,
Gary 10, Indiana

of universities and industry.

Mr. H. M. Barnes of the Chrysler Corporation Department of Industrial Education outlined the mathematics training program that is used to train their skilled workers. Mr. Barnes pointed out that about one half of the classroom training is spent on mathematics skills that are needed in each trade. He distributed to the group a bulletin published by the Chrysler Corporation. This bulletin was an illustrated list of industrial problems that are encountered in the industry. Copies may be obtained by writing to the School in Detroit, Michigan.

The Central Association publishes "School Science and Mathematics", and meets once a year. Any council member interested in becoming a member of the Association should write to Dwain E. Small, Senior High School, Richmond, Indiana.

--Dwain E. Small
Secretary, CASM, '53

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Council for 1955

Mr. Jackson B. Adkins--President
  The Phillips Exeter Academy
  Exeter, New Hampshire
Mr. Henry W. Syer--Vice-President
  Boston University, Boston, Mass.
Miss Janet Height--Secretary-Treasurer
  Wakefield High School
  Wakefield, Massachusetts
Miss Miriam Loring--Editor
  Belmont High School
  Belmont, Massachusetts

Term Expires 1955

Miss Barbara Betts
  D. C. Heath & Company
  Boston, Massachusetts
Prof. Edward M. Cook
  Northeastern University
  Boston, Massachusetts

Term Expires 1956

Miss Catherine Black
  Junior High School
  Quincy, Massachusetts
Mr. Robert E. Maynard
  Phillips Andover Academy
  Andover, Massachusetts

Term Expires 1957

Miss Minnie Belle Brewer
  The Buckingham School
  Cambridge, Massachusetts
Mr. William A. Lowell
  Chelsea High School
  Chelsea, Massachusetts
Prof. Harris Rice--Past President
  Polytechnic Institute
  Worcester, Massachusetts

--Tear off--

Fifty-Third Spring Meeting
Saturday, May 14, 1955
Natick High School, Natick, Mass.

(All sessions will be held in the high
school cafeteria)

Morning Session 10:15 A.M.

"The History and Logic of Number Systems"
Barbara B. Betts, Mathematics Editor,
D.C. Heath & Co., Boston, Massachusetts

"Very Large and Very Small Measure-
ments" James H. Burrows, Instructor in
Mathematics, The Phillips Exeter Academy,
Exeter, New Hampshire.

12:00 Noon Luncheon

All luncheon reservations should
reach Miss Anna E. Finn, Natick Senior
High School, Natick, Mass., by May 7th.
Price for luncheon and services...$1.25.

Immediately after the luncheon there
will be a guided tour of the beautiful
new Natick High School. The Science
Teachers of New England are to meet in

the same building on May 14, so we shall
also have an opportunity to visit the
school planetarium, and the exhibit of
the Massachusetts Industrial Education
Association.

Afternoon Session 2:00 P.M.

"The Psychology of Numerical Behavior"
John B. Carroll, Associate Professor of
Education, Harvard University.

To reach the Natick High School
BY CAR--from Route 9 turn off at Duncan's
Donuts; follow Steen Street to Pond St.
Turn left on Pond St. and take the first
street on the right after passing the
cemeteries.

BY BUS--The Middlesex and Boston bus
(Newton to Framingham) goes on Pond St.
Get off at Oakland Street. The school
is within walking distance.

Perhaps you may be able to pool
transportation with some members of our
own or the other groups meeting there.

7th MATHEMATICS INSTITUTE
Middlebury College, Middlebury, Vermont
August 18-25, 1955

The seventh annual Institute for Teachers and Professors of Mathematics, sponsored by our New England Association of Teachers of Mathematics, is to be held this year at Middlebury College in Middlebury, Vermont, from August 18-25.

The program will provide five days of inspiration with leaders in the field of education, mathematics and science. For recreation over the week-end there will be excursions to Fort Ticonderoga, Ausable Chasm, and The Shelburne Museum. There will be the usual picnic and entertainment on Saturday with a "Sugaring Off" party on Sunday night.

Members of the Institute will be housed in Forest Hall and meals will be served in the College dining-rooms in this building. Your whole family will be welcome but we cannot provide for pets. The fees for the entire week, including a registration fee of $12.50, meals for six days, room for seven nights, will total about $50.00. Single meals may be purchased by anyone wishing to commute, and the registration fees for guests and children are somewhat less. No meals except breakfast will be served on Saturday and Sunday. A room may be reserved by sending $5.00 to Miss Sarah M. Curtis, The Northfield School for Girls, East Northfield, Mass.

Discussion Groups will be under the able leadership of Prof. Bruce Meserve, State Teachers College, Montclair, N.J., Prof. Morris Kline, New York University, Prof. Cletus Oakley of Haverford College, Miss Rachel Keniston, Stockton, California, and Mr. Chester Gadzinski, Statistical Specialist in Quality Control, General Electric Company; also Mr. Edwin A. Hoadley of the Mass. School of Art who inspired us all to great heights with his lecture last summer at M.I.T. The Junior High School Laboratory will be under the direction of Miss Florence Potter of the University of the State of New York, Albany; and Mr. Arnold Redgrave is in charge of the Senior High School one. We would be glad to have you let us know if you would be interested in a Laboratory Section for the elementary level.

Among the speakers at the general sessions are many old friends as well as new ones. These include Dr. John A. Holden, Commissioner of Education for the State of Vermont, Prof. Elmer B. Mode of Boston University, Prof. B. F. Wissler and Dr. Donald H. Ballou of Middlebury College, Dr. Vera Sanford of The State Teachers College, Oneonta, N. Y.,

and Dr. George R. Stibitz on "Computers". There will be an Open Forum under the direction of Dr. W.W. Rankin of Duke University.

Professor John G. Bowker of Middlebury is the General Chairman. Miss Sarah M. Curtis is in charge of housing and Miss Harriet Howard, The Ethel Walker School, Simsbury, Conn., is Publicity Chairman. Please send inquiries concerning the Institute to Miss Howard.

We think we have put together a program that will prove as stimulating and as much fun as those of past Institutes. We look forward to seeing many of you there.

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Those who cannot attend our own Institute because they will be in the middle west may want to attend the Fifteenth Summer Meeting of the NCTM at Indiana University, Bloomington, Indiana, August 20-24, 1955. Information about it may be obtained from Olive Leskow, 234 West 49th Ave., Gary 10, Indiana.

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Fifty-Fourth Annual Meeting
Saturday, Dec. 4, 1954

At the annual business meeting, officers were elected for the next two years (see page 1) and the treasurer's report was read and accepted. The meeting was then devoted to discussions of the theme: Concepts Taught in the Curriculum

High Lights from "Problem Solving"
Dr. Katherine E. O'Brien
Deering High School, Portland, Maine

Problem solving is like crossing the street in traffic — it may be luck. With interest even a slow student can make some progress. There must be excitement in learning, so dramatize the approach. Know your stuff and the people you're stuffing and you'll make it. Math reading is a discipline and must be retaught. Give a test by dictation, reading it twice. Give more practice in translating from algebra into English. Some students make a box, crawl into it, pull down the cover, and can't get out. Geometry problems (originals) often require the analytic method. Develop theorems by this method in class. The indirect method resembles establishing a candidate by demolishing the opponent's reputation. The psychology of creation is involved in problem solving. Problems are universal. Human nature finds its greatest satisfaction in problem solving. There ought to be a song with the refrain, "I can see it when you do it, but when I get home...."

The Song
by William Ransom
The angles that you pointed out
Upidee Upida
Are surely equal, yes, no doubt
Upideeida
I know they are, but why? Oh why?

I'll have to ask the F B I
Refrain:
   I can see it when you do it--
   But when I get home...

Let x be chosen as you chose
      Upidee Upida
This stuff is tough as goodness knows
      Upideeida
Then what on earth do you do next?
It's clear as Hebrew in the text!
Refrain:
   I can see it when you do it---
   But when I get home...

This cosine ought to equal one
      Upidee Upida
This trig just gets me on the run
      Upideeida
The sine ought not to come out two
I've lost the part I thought I knew
Refrain:
   I can see ti when you do it---
   But when I get home...

BAR MITZVAH

by Professor Bancroft H. Brown
Dartmouth College, Hanover, N. H.

   This all happened 50 years ago. Prof. Brown was the hero of this story. He was not an infant prodigy but he was good in arithmetic. His family was the kind of family that kept everything and they had a lot of old arithmetic books. Before Bancroft was ten he had solved most of the nastiest problems in his spare moments.

   His grandfather Brown kept a country store, liked puzzles, and liked paradoxes. His other grandfather, Wm. A. Mowry, was President of the Martha's Vineyard Summer Institute. Grandfather Mowry was hard to get along with. He saw no virtue im hiding his light under a bushel and he loved the limelight. Prof. Brown loved the limelight when he was a boy.

   Seven august gentlemen, including two college presidents, two school superintendents, a minister, a noted professor and a U.S. Commissioner, having heard the boastings of Grandfather Mowry about young Bancroft wished to see if he was as remarkable as the grandfather thought. So they assembled on a hot August afternoon and asked him the toughest arithmetic problems they could think of. All the gentlemen were dressed in Prince Alberts, ØBK keys, and yachting caps. It was a hot afternoon. Prof. Brown had a new necktie and new shoes for the occasion. Colored William (his grandfather's servant) was to pass the drinks later.

   Young Bancroft answered four questions correctly and then Dr. Harris suggested an intermission. They drank Moxie, except Dr. Tefft who had ice water.

   After the intermission, three more questions were answered correctly. Then Dr. Tefft asked "According to Milton's Paradise Lost, Satan, having been cast out of Heaven, fell for 9 days and 9 nights. I demand, how far is it from Heaven to Hell?" Tefft asked this one because he was upset by the Moxie incident. (He thought Moxie contained a stimulant and would not drink it.) All the group seemed to be saying silently, "Please don't get Dr. Tefft mad." Prof. Brown realized he was supposed to calm down Dr. Tefft as he had had a hard day and he produced the correct answer. (1,832.308,363 mi., 203 rd., 10 ft., 6 in.) Someone remarked "There is nothing too hard for the lad." Colored William said, "Sweet spirits of Beulah land, what things they figure out these days!" Dr. Tefft gave the benediction. Dr. Harris passed young Bancroft five crisp one dollar bills. He had never possessed as much money in his life. His status was changed. He had been an amateur, now he was a professional. William remarked, "Before the Lord, Master Bancroft, you elucidated the straight road to hell."

Dinner Meeting
February 5, 1955
Topic - Proof -- Inductive and Deductive

Miss Julia W. Bower
Connecticut College, New London, Conn.

   Miss Bower described a freshman course at Connecticut College designed to make the student independent of teaching. They learn to study the text, and gradually learn to be satisfied only with complete proofs; and to appreciate polished work. The students learn the difference between acceptance and real understanding by having to do the proofs themselves. These proofs are required not only in algebra – for example proving that the product of two numbers is zero if and only if one of the numbers is zero, - but also in analytical geometry-- for example deriving the formula for the distance between two points. The finding of geometric properties from algebraic relations is also emphasized. Although students develop at widely different rates and must be held to different degrees of rigor at different levels, Miss Bower asked if this course could not be better taught in the twelfth grade than in the first year at college. Having the students be very complete in thinking and writing makes them very mature, and produces budding mathematicians.

William G. Shute, Choate School
Wallingford, Conn.

   "I remember the first time I learned to reason. It was in the Gay Nineties and there was a school visitor. I was given three toothpicks to divide in two equal parts and was stumped. The minister's daughter solved the problem by putting one toothpick behind her back. A third student broke one in two and taught me reasoning." Aristotle said "...in education habit must go before reason..." Dont teach the child-

ren to think at first; they get confused.
A new subject puts a student in a state
of shock; so you continue to repeat it
till it becomes a part of them. Then
they begin to think. First year algebra
is largely manipulative. Deductive rea-
soning appears in the second year. In
plane geometry the theorems should be
learned word for word and some proofs
learned and recited, but solid goemetry
requires good hard thinking. To the
statement "I'll never use this stuff"
the reply is "You'll be a reasonable be-
ing if you master this."

Discussion brought out very clearly
the differences between courses taught
for aesthetic enjoyment in a liberal
arts college and those aimed at practi-
cal applications in technical schools.

Dinner Meeting
March 26, 1955

Topic: Relationships and Operations
Miss Marion Bates.Brookline High School

Twenty-five years ago there were
teachers of definite areas in mathemat-
ics isolated from the rest. Then came
a period of "teachers of youth" where
the subject matter was merely a means to
an end - the training of citizens. Now
we are teachers of mathematics again and
are better teachers. Relationship is
defined as some existing connection be-
tween two elements. In the youngest
grades a boy knows only that he has re-
lations. Then he becomes aware of non-
mathematical comparisons and eventually
of numerical and geometric relations -
as in putting pegs in holes. Teaching
does not lead to learning unless accom-
panied by active experience, and there
are many everyday experiences of com-
parison. As the boy goes on to Junior
and Senior High and college he meets
new relationships, both mathematical
and non-mathematical; and to be succes-
ful in mathematics he must understand
implied relationships as well as expli-
cit ones. Creative thinking deals with
relationships.

Operations cannot be considered with-
out relationships and together they lead
to a concept. Operations vary in dif-
ficulty. For a young child it might be
giving a name to a dog. As the child
progresses he performs operations of a
higher and higher order; and in the
High School he has also to decide what
operation to use and how to apply it.
He has to say not only "What is the an-
swer?" but also "How do I get it?"

Henry Syer - Boston University

Relationships and operations run
through mathematics from kindergarten to
college. A relationship may be defined
as any statement about an element which
can be judged true or false: If we have
$R_m(x_1, x_2 \ldots x_m)$T or F, we see that m

must be two or more--i.e. $R_2(x_1, x_2)$ may
be evaluated as true or false. If x is
trees and R is sets of trees, for instance,
20 trees to be placed in 5 rows with 7 in
each row, the relation may or may not be
satisfied. At the college level x_1
might be Function, x_2 differential equa-
tion, and R the solution. The order of
the relation is the number of elements ne-
cessary to decide whether the relation is
true or false. Since larger numbers of
objects tend to be compared in two groups,
the relation is still of the second order.

What does operation mean? $X_m = Op(x_1,$
$x_2 \ldots x_{n-1})$ is an operation on x_{n-1} ele-
ments. If $R_m (x_1,x_2\ldots x_n)$ and $R_m(x_1,x_2\ldots x_m)$, then $x_m = x_n$. If $x_1,x_2\ldots$ are
positive whole numbers, the operation may
be addition. Bisecting a line segment may
be done by a series of operations. An
operation can be determined by only one
element. For example finding the negative
of a number; finding the value of a com-
plex number; or finding the center of a
circle.

ATMNE welcomes the
following new members:

Bardol, Mrs. Ann
  Beverly Junior High School
Burlingame, Warren F.
  Investment Administration
Cerasoli, Peter P.
  Revere High School
Colby, Eben T. Winthrop High School
Collins, James L. Revere High School
Connor, Roger T., Northeastern University
Finn.Catherine, Natick Junior High
Flood, Edward J. Revere High School
Forest, Bernard A. Boston University
Hackett, Katherine M. Beverly Junior H.S.
Hinchey, Margaret M. Hyde Park H.S.
Hovenden, Lena F. Fessenden School
Hunt, Helen J. North Quincy H.S.
LaCivita, Louis J. Attleboro H.S.
McDonald, Elizabeth M. Stamford Conn.
McLaughlin, Eugene L. Boston Latin School
Thompson, Helen, Beverly Junior H.S.
  and the following New Members from the
Connecticut Valley Section:

Allen, Mrs. Helen K., Wilmington H.S.
  Wilmington, Vt.
Barrett, Lawrence, 29 Cambridge Road
  Bristol, Conn.
Bassette, John D., Mount Hermon School
  Mount Hermon, Mass.
Bates, Donald G. Worthington Ridge
  Berlin, Conn.
Buchanan, Walter G. 385 Hope St.,
  Glen Brook, Conn.
Bucknam, William R. New Milford H.S.
  New Milford, Conn.
Bushey, Benjamin R. 16 Carlisle St.,
  Springfield, Mass.
Casey, Paul, Bristol H. S., Bristol, Conn.
Casinghino,Enrico,Suffield H.S.,Suffield,"
Chelinski, Mrs. Frances, Milford H.S.
  Milford, Conn.
Clebowitz, Alexander, Teachers College
  of Conn., New Britian, Conn.

(also welcomes)

Collins, Anne H., 66 Ventura St.,
        Springfield, Mass.
Condell, Nancy L., 1293 Post Road
        Fairfield, Conn.
Coombs, J. D., Woodbury H.S.
        Woodbury, Conn.
Dickerman, Frances, Naugatuck H.S.
        Naugatuck, Conn.
Downing, Robert B., Valley Road
        Westport, Conn.
Duskon, Jane, 391 Meadow Street
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Elliott, Bruce, Bristol H.S.
        Bristol, Conn.
Felicia, Brother, Notre Dame H.S.
        West Haven, Conn.
Ferlini, Alvaro, St. Joseph's College,
        West Hartford, Conn.
Ganz, Phyllis, Northfield School for
        Girls, East Northfield, Mass.
Hall, Raymond, R.D.2
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Heath, John M., Hopkins Grammar School
        986 Forest Road, New Haven, Conn.
Henrikkson, Gunhild, L., 71 Pine Hill
        Ave., Glenbrook, Conn.
Hoffson, June, 123 Washington St.,
        Hartford, Conn.
Hoxie, Hazel, Center Gould Hall, North-
        field School for Girls, East North-
                field, Mass.
Kendrtarvich, John, Marianapolis,
        Preparatory School, Thompson, Conn.
Kilfoil, Mary Jean, Plainville H.S.
        Plainville, Conn.
Lannon, Dorothea M.
        173 North St., Stamford, Conn.
Launer, Leonard L.
        40 Wildwood St., Fairfield, Conn.
Lindman, Edwin L.,Canterbury School
        New Milford, Conn.
Linn, Andrew, Hamden Hall Country Day
        School, Hamden, 17, Conn.
Lowell, John L. 185 Edgewood Ave.,
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Maby, Earl
        Lee H.S., Lee, Mass.
Nearing, Cary, Choate School,
        Wallingford, Conn.
Norvig, Torsten, Buxton School,
        Williamstown, Mass.
Parkhurst, Wallace A., Danbury H.S.
        Danbury, Conn.
Paveloak, Joseph, Hopkins Academy,
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Peters, Helen M., Mass.State Teachers
        College, Westfield, Mass.
Ranft, Winston A., McTernan School
        Waterbury, Conn.
Ravitz, Philip, Warren Harding H.S.
        Bridgeport, Conn.
Rosenbaum, David, Milford School,
        Milford, Conn.
Rosenbaum, Harris, Milford School,
        Milford, Conn.
Rosenbaum, Mrs..Louise, St. Joseph
        College, West Hartford, Conn.

Rosenbaum, Prof. Robert A., Wesleyan
        University, Middletown, Conn.
Scanzillo, Thomas, Warren Harding H.S.
        Bridgeport, Conn.
Sharp, Capt. Henry S., U.S. Coast Guard
        Academy, New London, Conn.
Spilecki, Robert M., Box 43,
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Stanley, Brother, Notre Dame H.S.,
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Stebbins, Ruth, The Ethel Walker School,
        Simsbury, Conn.
Steele, George, Choate School,
        Wallingford, Conn.
Stevenson, Walter B., Staples H.S.,
        Westport, Conn.
Strout, Vincent D., Roger Ludlowe H.S.,
        Fairfield, Conn.
Tata, Ray, Staples H.S.,
        Westport, Conn.
Taylor, Ann E., Box 166,
        Cheshire, Conn.
Turner, Mrs. Prescott, Roger Ludlowe H.S.
        Fairfield, Conn.
Tripp, Mrs. R.M., Nathan Hale Jr. H.S.
        New Britain, Conn.
Werner, David L., 417 LaSalle St.
        New Britain, Conn.
Welna, Irene, 176 Smith St.,
        New Britain, Conn.
Zervas, George, East Hartford H.S.,
        East Hartford, Conn.

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Contact your state representative, or
the ATMNE secretary, Janet S. Height,
41 Richardson Ave., Wakefield, Mass.

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Abstract

Statement of problem - It is commonly agreed upon in educational circles that professional growth is an essential factor to the development of sound and efficient teaching. Among the several state and regional associations of mathematics teachers, mathematics newsletters or bulletins maintain a place of importance as professional aids in that they serve as a major means of communications between the professional group and the individual teachers.

Despite the fact that more than twenty associations of mathematics teachers publish a newsletter or bulletin of some type, relatively little attention has been given to this area of activity. Except for occasional material in The Mathematics Teacher, no detailed study of mathematics newsletters is available. It is the intent of this project to analyze and summarize the status of mathematics newsletters as they exist today. The survey is primarily of a quantitative nature without particular reference to qualitative ratings of the newsletters individually or as a group.

Three important aspects of any journal or bulletin are its purposes, its content, and its means of publication. It is to these three areas that the major portion of this thesis is confined. The analysis of the mathematics newsletters with respect to their purposes, content, and means of publication was conducted from three significantly different points of view - the author's, that of the editors of the newsletters, and that of the readers of the newsletters.

Author's analysis – Newsletters were obtained from twenty different associations for use in this study. Only regularly published newsletters directly related to a professional organization were utilized, thereby excluding student journals or special communications not regularly a part of the sponsoring organization's program. Copies of the available newsletters were examined to determine the types of articles included, the percentage of space devoted to each major classification, and the essential physical features of the publications.

A wide range of articles was found in the various newsletters, and twenty-one principal types were drawn up as covering the entire gamut. News of the activities of the sponsoring organization and articles on methods of teaching were found to be the two types most frequently encountered in the newsletters. Everyone of the twenty newsletters examined contained news of its sponsoring organization with the percentage of space devoted to this type of article varying from eleven per cent to ninety-five per cent of the total space in a newsletter.

The variation found in the styles of the newsletters was as marked as the difference in the types of articles used. The dimensions of the newsletters ranged from 6 X 9 inches to $8\frac{1}{2}$ X 14 inches, with $8\frac{1}{2}$ X 11 inches the most popular size. The least number of pages in any of the newsletters was two, and the greatest number of pages was thirty-two.

Only four of the associations used covers for their newsletters and in only six cases was any color used. Three methods of printing

were found to be utilized among the newsletters with stencil the most common method. Offset and letterpress were the two other styles of printing.

Editors' evaluations - A questionnaire seeking pertinent information about his publication was sent to each editor of a newsletter, and seventeen replies were received. The editors agreed that a wide range of articles would be desirable in their newsletters, but noted that in any single publication such a wide spread of material was not to be found. A s expected, news of activities of the sponsoring organization was given as the most frequently used item.

With respect to the purposes of their newsletters, the editors felt that they were operating on specific, well-defined objectives, and that their efforts were being justified. The most often mentioned objective was that of providing reports on the work of the sponsoring organization, an objective which is borne out in the previously reported content of the publications.

Publication data received from the editors revealed that average circulation per issue varied from 100 to 1000 with 300 as a median figure. The frequency of publication ranged from one to four issues per year with two issues being the most common practice. The median cost per issue of the newsletters surveyed was thirty dollars.

The editors stated that the major difficulty experienced in their work was apathy on the part of teachers, while financial restrictions were also frequently mentioned as troublesome.

<u>Readers' evaluations</u> - Questionnaires similar to those used in questioning the editors were sent to a small sample of readers of each of fourteen newsletters for which readers' names were available.

Every one of thirteen suggested types of articles was considered worthwhile by a large majority of the readers who were polled. A nnouncements about workshops and conferences, reports of activities of the sponsoring organization, and news about teaching aids were the most frequently supported categories. From these results it is evident that the readers, like the editors, were virtually unanimous in the belief that news directly related to the activities of the parent organization deserved primary attention in the newsletters.

When asked for their reactions to their newsletters, approximately two-thirds of the readers stated that they read the publications thoroughly, and a somewhat smaller percentage indica ted that they considered the newsletters as an aid in professional growth.

The readers were virtually unanimous in their feeling that they were free to contribute material to their newsletters, but only slightly more than sixty per cent felt that their newsletters were being managed on the basis of the readers' opinions.

The most important contributions of newsletters in the eyes of the readers were the building of professional spirit and the aiding in classroom teaching. The most often mentioned criticism was that of inadequate content, but there was little agreement as to what constituted adequate material.

Conclusions – Unquestionably the major purpose of mathematics newsletters as determined by this survey is the professional improvement of teachers of mathematics with the resultant raising of the quality of mathematics instruction. Editors and readers are largely agreed that the newsletters are making a significant contribution in the area of the teaching of mathematics and in serving as a common bond uniting mathematics teachers.

Although the range of articles found in newsletters is wide, virtually all types may be considered in one of three categories – those directly relating to the professional body sponsoring a publication, those concerning the actual teaching of mathematics, and those of a personal or recreational nature.

The opinions of the editors and readers vary somewhat as to the popularity and usefulness of the several types of articles. The editors gave high ranking to articles dealing with the sponsoring organization whereas the readers expressed preference for methods of teaching and teaching aids. This divergence of opinion suggests that perhaps some newsletters are not providing the type of material desired by its readers.