Needed Research in Secondary Education

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Bulletin 1937, No. 28

UNITED STATES DEPARTMENT OF THE INTERIOR

Harold L. Ickes, Secretary

OFFICE OF EDUCATION · J. W. Studebaker, Commissioner

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Foreword

THE National Committee on Research in Secondary Education, which took such an active part in the National Survey of Secondary Education during its progress, has been no less interested in follow-up of the survey after its completion. The suggestions coming from this organization have been most valuable. The present publication is an outgrowth of one of those suggestions made by the members of the committee to the Office of Education through Carl A. Jessen, of the Office staff, who is also secretary of the committee and was from 1929 to 1932 coordinator of the National Survey of Secondary Education.

In the preparation of this bulletin Mr. Jessen has had helpful advice and assistance from members of the staff of the National Survey of Secondary Education, who examined the materials prepared on the respective monographs of which they are authors; from Harl R. Douglass, of the University of Minnesota, and D. H. Eikenberry, of Ohio State University, who reviewed parts of the manuscript while it was in preparation; and especially from Leonard V. Koos, of the University of Chicago, who was associate director of the survey, and contributed materially to revision and improvement of the present manuscript.

The bulletin on Needed Research in Secondary Education is issued in the belief that it will be useful to workers in educational research and through them to schools and educators throughout the Nation.

BESS GOODYKOONTZ,
Assistant Commissioner of Education.

I

PURPOSE OF THIS PUBLICATION

THE publication and wide circulation of the monographs of the National Survey of Secondary Education offer an appropriate background for a statement on research needed in secondary education. The survey itself, comprising in the aggregate more than 4,400 printed pages, is a collection of important research studies relating to organization of schools, the pupil, administrative and supervisory problems and personnel, the curriculum, and the extracurriculum. It is to be noted that a number of important fields were omitted from consideration in the survey. These omissions were made by intention. Among them are history of secondary education, objectives, finance, training of teachers, and buildings and equipment. This limitation on subjects is carried through also in the present publication.

This bulletin, in fact, follows rather closely the plan and content of the survey monographs. For instance, quotations and summaries of statements regarding needed research taken from the monographs appear from time to time in these pages. Where, as happens with most of the monographs, no listing of research studies is included, attempt has been made to draw out the implications and suggestions for research studies from the findings reported and the procedures employed. The writer, while feeling free to draw his material from numerous sources, nevertheless has throughout maintained the viewpoint that this discussion is principally in the nature of a follow-up of the National Survey of Secondary Education.

No effort is made to outline the research undertakings in detail. Such an attempt would carry the project far beyond

its purpose and would, besides, be unnecessary, since students of education who desire to undertake any of the studies here suggested can secure assistance in planning their investigations from numerous specialists in the various fields covered. It is hoped that the problems recommended may be judged to be both important and susceptible of study by techniques already available or possible of development on the basis of present information.

The numbers and titles of the survey monographs and the names of the authors follow:

1. Summary. Leonard V. Koos and staff.
2. The Horizontal Organization of Secondary Education—A Comparison of Comprehensive and Specialized Schools. Grayson N. Kefauver, Victor H. Noll, and C. Elwood Drake.
3. Part-Time Secondary Schools. Grayson N. Kefauver, Victor H. Noll, and C. Elwood Drake.
4. The Secondary-School Population. Grayson N. Kefauver, Victor H. Noll, and C. Elwood Drake.
5. The Reorganization of Secondary Education. Francis T. Spaulding, O. I. Frederick, and Leonard V. Koos.
6. The Smaller Secondary Schools. Emery N. Ferriss, W. H. Gaumnitz, and P. Roy Brammell.
7. Secondary Education for Negroes. Ambrose Caliver.
8. District Organization and Secondary Education. Fred Engelhardt, William H. Zeigel, Jr., William M. Proctor, and Scovel S. Mayo.
9. Legal and Regulatory Provisions Affecting Secondary Education. Ward W. Keesecker and Franklin C. Sewell.
10. Articulation of High School and College. P. Roy Brammell.
11. Administration and Supervision. Fred Engelhardt, William H. Zeigel, Jr., and Roy O. Billett.
12. Selection and Appointment of Teachers. W. S. Deffenbaugh and William H. Zeigel, Jr.
13. Provisions for Individual Differences, Marking, and Promotion. Roy O. Billett.
14. Programs of Guidance. William C. Reavis.
15. Research in Secondary Schools. William H. Zeigel, Jr.
16. Interpreting the Secondary School to the Public. Belmont Farley.
17. The Secondary-School Library. B. Lamar Johnson.
18. Procedures in Curriculum Making. Edwin S. Lide.
19. The Program of Studies. A. K. Loomis, Edwin S. Lide, and B. Lamar Johnson.
20. Instruction in English. Dora V. Smith.

21. Instruction in the Social Studies. William G. Kimmel.
22. Instruction in Science. Wilbur L. Beauchamp.
23. Instruction in Mathematics. Edwin S. Lide.
24. Instruction in Foreign Languages. Helen M. Eddy.
25. Instruction in Music and Art. Anne E. Pierce and Robert S. Hilpert.
26. Nonathletic Extracurriculum Activities. William C. Reavis and George E. Van Dyke.
27. Intramural and Interscholastic Athletics. P. Roy Brammell.
28. Health and Physical Education. P. Roy Brammell.

Throughout the present publication the monographs will be referred to by the numbers assigned to them in the above list without further detailed reference.

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II

SOME CHARACTERISTICS OF RESEARCH IN SECONDARY EDUCATION

Study of Practices

MUCH of the educational research conducted at the present time is characterized by a strong emphasis on the study of practices. This undoubtedly marks an advance over the earlier condition when the predominating stress was on the prejudice or opinion of the person or persons expressing a judgment without much regard to the securing of any considerable amount of objective evidence in support of that judgment. A sort of validation is supplied by common practice since it reflects both a theory in which many have believed and an experience in which many have participated.

The study of practices is of two principal types. The first of these, the mere study of status, takes a group of schools of a certain size, or type, or class, and studies them with a view to learning and reporting what their practices are in a given field. It often proceeds on the tacit assumption that frequency of occurrence of a given practice is indicative of desirability of that practice. In the other type, the schools to be studied are selected on the basis of certain criteria of excellence applied to them. In the study of outstanding schools as well as in the study of unselected schools the implication is present that the best practical ways of prosecuting any given educational undertaking are in operation somewhere; the problems confronting the research worker are to identify the schools and study their practices.

It would appear, however, that theoretically better ways of doing the job may be possible even though these better ways may not have been put into operation by any school, or, if practiced, are so difficult to find that they are not uncovered in the schools selected for study. A study of *what should be* may be justified by fully as convincing a train of logic as a study of *what is* or *what has been*.

The greatest need in educational research at the level of the secondary school is for evaluation of present and projected procedures. Obviously, evaluation may and does come through study of practices. Obviously, also, it may come through experimentation under which modifications and controlled conditions are introduced in the practices to render the study more significant. There is a sort of three-level evaluation suggested here, the first level being a study of results of practices in any and all schools as found, the next being a study of outcomes of pratices in schools selected for their outstanding qualities, and the third a study of educational effects under experimental conditions set up especially for the purpose of testing theory.

Certainly it would be unfortunate if the impression were left that educational experimentation is not taking place at the present time. Much experimentation is being conducted. However, the experimental undertakings have often been narrowly limited in scope as regards both phases investigated and number of individuals or units cooperating in supplying the data. Some of the most significant experimental studies have been made by students of education who were engaged in preparing master's or doctor's dissertations; consequently, the facilities in time and money were all too often inadequate for a thorough canvassing of the problem under consideration. Generally speaking, the investigations were well planned; the techniques employed were excellently conceived and effectively executed; but the scope of the studies was so restricted as to allow only tentative conclusions usually hedged about by warnings not to apply the

findings or implications of the findings to any situations except those specific ones which had been examined. Studies more extended in scope and involving numerous cases under various conditions are needed if research is to be most useful to the high-school administrator and teacher. The prospectors have done a good job of exploration and have staked numerous promising claims; among the important functions of future research are not only further exploration but also extension of the diggings in search of deposits, the existence of which is indicated by the findings of the prospectors.

Coordinated and Cooperative Research

Coordinated and cooperative programs are needed. These should not aim at coming out with something so brand new or so startling as never to have been heard or thought of before. Rather, since they involve the expenditure of considerable amounts of energy and money, they should be in fields which have been well canvassed—fields which because of their importance have appealed to many investigators and in which much preliminary work has been done. The large coordinated study should profit from these earlier investigations, not by drawing their findings together and coming out with any sum total of these findings (any attempt to do this is usually futile and utterly impossible of accomplishment), but by examining the various methods of approach and the procedures utilized in order that the large study may center its attack on the problems which are important and at the same time susceptible of solution.

A certain amount of coordination or at least concerted attack on educational problems may be secured through studies on the same subject by a number of schools or individuals, such as, a series of dissertations on some phase of the curriculum or simultaneous studies on the history of education in various States. If such a series of studies is planned cooperatively it is possible to have different portions of the whole conducted by various persons or agencies and still come out at the end with findings possessing unity and

coherence. This method is followed by the Commission on the Relation of School and College established by the Progressive Education Association in 1930. Through cooperation in planning on the part of nearly 300 colleges and universities with 30 secondary schools, a significant attack is being made on the problems of college entrance without any thought that the approach must be made in a uniform way in the 30 schools.

The planning may be cooperatively centralized and the execution centralized as, for instance, in the extensive investigation now in progress under the auspices of the Cooperative Study of Secondary School Standards. This study was begun in 1933 as a cooperative undertaking of the six regional associations of colleges and secondary schools representing New England, the Middle Atlantic region, the South, the North Central States, the Northwest, and the West. Through having representation on the committee in charge of the study, the various associations bring together their judgments and experiences to the end that secondary schools may not only be accredited on the most advanced bases possible, but may also be stimulated to improve their educational services progressively from year to year. By pooling their own appropriations with the grant from an educational foundation and employing a research staff, the associations insure, in addition to cooperative planning, central gathering of facts, central tabulation of data, and central preparation of the report, all under the close direction of the cooperative committee.

Any plan looking toward central conduct of an extensive research undertaking calls for more adequate financing than often is available to educational projects. However, even where finance is definitely limited it is possible to secure many of the advantages of a comprehensive study through central or cooperative planning and cooperative execution. The series of youth surveys conducted during 1935 by 13 local communities in cooperation with the Office of Education may serve as an illustration of this method of attack. The plan for these studies was centrally arrived at through

cooperation of a considerable number of individuals and agencies, but responsibility for the actual conduct of the surveys, including the gathering of the information, the tabulation of the data, and the preparation of the local report was assumed by the individual communities. Nevertheless, the data gathered and the procedures employed were comparable to such an extent that the results from the 13 surveys add up to a meaningful total.

The three types of coordinated research described, namely, (1) central planning and diversified attack by a group of cooperating agents, as in the Progressive Education Association study, (2) central planning and unified attack from a central source cooperatively established, as in the Cooperative Study of Secondary School Standards, and (3) central planning and unified attack by a group of cooperating agents, as in the youth surveys, have certain important elements in common which probably should be commented on before the subject is dismissed.

In the first place, these studies are comprehensive through cooperative action. By pooling of resources, human and material, they bring to bear the best thought and experience available on the subject under investigation and supply enough cases to give the findings an authority which is usually lacking in limited studies. Second, all of them involve central planning arrived at through cooperation of a considerable number of individuals and agencies. While uniformity in approach is not always required, the left hand is at no time unaware of what the right hand is doing. Third, because of the cooperative feature in their planning and prosecution they have the advantage of continuously educating and interesting those persons and agencies that should be most benefited by their findings; this value has repeatedly been demonstrated in investigations leading to course of study revisions in States and cities through cooperative action of the teachers who ultimately put the courses into use. And, finally, they are more likely than individual researches to be practical in their applications. It is very easy for the scientific research worker to say, "Wait until

I can check further," or "I shall give attention to that problem when I complete my present project." But the school board, the administrator, and the teacher cannot wait. They know that important decisions are being made daily in 25,000 secondary schools in the United States. And when they are represented on a governing board or committee of a cooperative undertaking, they are in position to direct the research worker to important practical problems and to remind him that it is his responsibility to supply the facts upon which conclusions and actions may intelligently be based by those who determine the administrative policies and the classroom practices in the schools.

·III·

FIELDS AND SUGGESTED STUDIES

Horizontal Organization of Secondary Education

THE influx of pupils to secondary schools has brought with it problems not visioned some years ago when only a small percentage of the population continued in school after completing the work of the elementary grades. In those days the pupil population in secondary schools was much more nearly homogeneous in abilities, interests, and needs. Now, with almost two-thirds of those of secondary school age actually enrolled in the schools, ways must be devised for meeting the variations in scholastic aptitudes, psychological composition, and vocational destination.

One way in which an effort has been made to meet some of these problems is through expansion of the curriculum, especially by introduction of vocational offerings. In practice this movement has shown itself in two principal ways, namely, (1) in adding vocational subjects to the programs of existing schools and (2) in the establishment of specialized schools. Monograph No. 2 of the National Survey of Secondary Education deals with these methods as practiced, respectively, in comprehensive and in specialized schools.

One phase of the problem concerns the extent to which pupils select the school nearest to their homes regardless of the specialized work featured by the school or regardless of other and more remote schools, either specialized or general in character, offering the types of work desired or needed. Data presented in the monograph indicate that in the three cities studied, pupils generally selected their schools, if specialized, because of the type of work offered and not

because of proximity of residence. Data from three cities, however, are not conclusive. Information on this subject from other cities is needed and can be secured by following the techniques described in chapter V of Monograph No. 2. In addition to throwing light on the effect which proximity of the school has upon its selection by the pupils who register in it, such studies will reveal to the communities those individuals who through improved guidance service may be led to more intelligent utilization of the school opportunities provided.

Another phase of the problem to which the survey points the way of investigation rather than the answer is in regard to attitudes and association of pupils in specialized and comprehensive schools. It has been rather generally assumed that pupils in specialized schools do not have the opportunity to associate with pupils interested in other lines of work to the same extent as do pupils enrolled in comprehensive high schools. The degree to which this assumption is true has never been ascertained with any conclusiveness and the psychological changes and effects which result from such association or the lack of it have not been identified. A limited study of this type through securing judgments of teachers and through construction and administration of attitudes scales to pupils in specialized and comprehensive high schools is described in chapter VII of Monograph No. 2. Additional studies on this subject may be made by applying the techniques of the survey investigation to local situations. Diagnosis of the attitudes developed in the various schools will not only reveal the effect which segregation has upon the attitudes of pupils, but will also serve to define the educational task of each school so investigated.

A third phase is follow-up of pupils after they have left school. While the follow-up studies described in Monograph No. 2 were conducted to throw light on the problems of specialized and comprehensive schools, the purposes of follow-up studies need not be thus limited. Education is in need of many more follow-up studies to learn what has happened not only to the pupils who have been graduated but also to those who have dropped out of school. Enthu-

siastic interest in studies of young people has been developed in the years immediately following completion of the survey,[1] but frequently these studies are limited to those who have been graduated from high school. Moreover, the studies generally need to be made more comprehensive in scope so as to include, in addition to vocational and educational careers, the social-civic and cultural activities of those who have left the schools. Because educational practices are so greatly in need of continuous evaluation and because follow-up studies offer such large possibilities in the way of evaluation, the opinion is ventured that this will prove to be one of the important fields for future research in education. Persons interested in following it will want to acquaint themselves with the methods and findings reported in chapter VIII of Monograph No. 2.

A study which the survey did not undertake concerns the extent to which specialized schools are actually specialized and in how far they are generalized in their curriculums. It would be illuminating to have case histories of curriculum development in a number of schools with names indicating specialization, for the purpose of discovering whether the programs of studies in these schools have tended toward more generalization or toward greater specialization.

A major method adopted for meeting the needs of the large army of pupils registering in the schools is the establishment of a number of auxiliary forms of education, supplemental mainly to the secondary school. The principal representatives of these auxiliary forms, namely, part-time cooperative, continuation, evening, and summer schools, together with correspondence instruction, are described in chapters of Monographs, Nos. 2 and 3.

The part-time cooperative school is operating in a field of great possibilities involving as it does the training of a

[1] See Office of Education Bulletin 1936, no. 18–VI "Youth—Community Surveys" and an article on the same subject appearing in the June 1936 issue of *School Life*. As this is written, the Cooperative Study of Secondary School Standards has in progress two extensive follow-up studies of graudates and drop-outs and the American Youth Commission of the American Council of Education has as one of its projects thorough-going studies of youth in one of the States, in a middle-sized city, and in a smaller community.

young person by keeping him on the job and in school at the same time through a part-time arrangement. Part time day-school education has not been widely attempted in the United States and we still find ourselves committed in practice to a number of years of full-time school, then a number of years of full-time employment (interspersed too often with periods of full-time unemployment), and finally a number of years of full-time retirement. The part-time cooperative school would make easier, more certain, and less subject to disappointment and delay the transition from full-time school to full-time employment. Undoubtedly, the reason it has not been adopted more generally is the large number of problems attendant upon its introduction. It is the function of research to attack the unsolved or partly solved problems of part-time education involving such subjects as securing jobs for the pupils, coordinating the curriculum with work on the job, relationships with employers and with labor, and guidance of the pupils. Moreover, the part-time cooperative school idea need not be limited to the vocational field. Research should explore its possibilities also in achieving some of the other objectives in education, such as, worthy home membership, worthy use of leisure time, and social, civic, and cultural training.

Both evening and summer schools are essentially independent schools and as such have numerous services and problems parallel to those found in regular day schools. For this reason many of the research studies suggested in these pages are equally appropriate for evening and summer schools, sometimes with little change, at other times with modifications to fit the character of the part-time schools. The close relationships which exist between evening schools and vocational education and between them and adult education offer opportunities for useful research on their organization and teaching problems.

The place of the continuation school in American education is far from determined. In recent years its enrollment has been greatly reduced. What is its place in the future development of secondary education?

Correspondence instruction offers an excellent field for research with regard to its organization, administration, curriculum materials, and general procedures. Various modifications have been made and others undoubtedly need be introduced in order that the work done may merit recognition by reputable educational institutions and in order that those completing correspondence courses may have their work so recognized. Wide study interests and vocational ambitions of school pupils and adults await the coming of correspondence work which will be accorded the same degree of respect and recognition that work completed in an educational institution now commands. It is the function of research to point the way toward improvement and expansion of correspondence work.

Although the high school has had a remarkable growth, one cannot ignore the fact that more than one-third of those who because of age might be expected to attend are not enrolled. This out-of-school group has received little attention from research workers. Something may undoubtedly be done for them through redirection of the work of the traditional school and through introduction of newer agencies such as have been discussed in the preceding paragraphs. However, it appears likely that, change and supplement the high school as we will, there will still remain a large number of youths who because of social, economic, or personal factors will not be drawn into the school. The development of programs of out-of-school educational, vocational, and recreational activity to occupy the time of these youths, both boys and girls, is a research problem of the greatest magnitude.

Secondary-School Population

The facts regarding number of pupils enrolled in secondary schools are published periodically in the Biennial Survey of Education issued by the Office of Education. Insofar as possible the data include distribution by States and by types and sizes of schools.

While data on the popularization of secondary education are thus available, much remains to be done in studying the

characteristics and conditions of the pupils in attendance. As greater and greater numbers of pupils enter the schools, the question of democratization is coming more and more to the front. When only 10 percent of the population of high-school age were attending high school it was accepted as inevitable that the school would be selective. Now with 60 or 65 percent of this population in attendance, interest and concern are aroused about the extent to which the school is drawing its pupils from different groups of our American citizenship.

The numerous studies of intelligence and socio-economic factors supply evidence of this interest. Usually, however, these studies are greatly limited in extent and are not comparable in their findings. Need exists for many more studies in this field; especially is it desirable that the studies should be closely integrated in order that the findings may be comparable. The repetition of Dr. Counts' 1920 study described in chapter I of Monograph No. 4 is an illustration of such coordination.

Chapter II is suggestive of a method for studying the socio-economic status of pupils in various types of schools and curriculums, and, in addition, provides data with which findings for any given school or city may be compared. The significance of such findings for the organization of individual schools, guidance of pupils, curriculum and extracurriculum offerings, teaching methods, and relations with the community is so generally agreed upon as to need no elaboration. Improvement of these procedures provide a vast field for inquiry which will be developed further in these pages. Certainly, as the school develops training methods better suited to pupils of different backgrounds and interests, its service will become more and more effective; and as its service increases in effectiveness its holding power will be improved and its attractiveness to those not in school will be enhanced. Moreover, if the techniques used in studies of pupil personnel provide hints on how to analyze the characteristics, attitudes, interests, and aptitudes of that large group of youth not in school, a double purpose will be served.

Monograph No. 5 presents a method of scoring the organization of schools. Further development and improvement in the measures and their application are desired.[3] The object to be aimed at is a rating system which will make it possible with greater assurance to compare the effects and relative success of different types of organization, to ascertain, within limits, the efficiency of individual schools representative of differing types of organization, to determine the relationship of size of school to organizational type, and to judge the effects which varying outlays and financial arrangements for different organizational features have upon the results secured by the schools. These viewpoints and others are emphasized in the appendix to Monograph No. 5 from which the following is quoted:

> The present study of secondary-school organization has been subject to at least three major limitations. First, there has been no opportunity for thorough validation of the system of scoring used in judging the organization of individual schools. Second, a number of promising clues have had to be disregarded in the analysis of various types of organization and various sizes of schools, for want of the time and funds necessary to follow all such clues to a definite end. Third, the brief time interval covered by the study has prevented any long-term analysis of the effects of various types of organization under varying conditions.
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> The defects arising from these limitations may eventually be removed if certain further studies can be made. Schools of education or individual students of education will be interested, it is hoped, in adding to the investigations described in this report. The following list of possible further investigations is presented as a suggestion of types of studies which might prove fruitful.
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> This list does not pretend to be all-inclusive. Many investigations which are not specifically mentioned will occur to the thoughtful student as having direct bearing on the problems of school organization. The studies suggested

[3] Following the completion of the Survey, O. I. Frederick, co-author of Monograph No. 5, prepared a doctor's dissertation at the University of Michigan entitled "Two standardized check lists for the organization of secondary schools, one for junior high school grades and one for senior high school grades."

are those which will most directly supplement the particular investigations already made, or which will provide desirable checks upon the conclusions set forth.

A. Subjects suggested for further investigation for which data gathered in the present study may be used as a partial basis:

1. The validation of a system of rating the organization of an individual secondary school; in particular the determination of relationships between—
   (a) Practice in detailed aspects of organization and pupil achievement.
   (b) Practice in general aspects of organization and pupil achievement.
   (c) Practice in general aspects of organization and the judgment of competent specialists as to effectiveness of organization.
2. Analysis of the extent to which effectiveness in one major phase of organization is dependent upon special effectiveness in one or more other phases of organization.
3. More exact analysis of the typical organization of conventionally organized schools as a means of gaging the effects of reorganization.
4. Detailed analysis of the organization of outstanding private schools as contrasted with the organization of public schools.
5. Study of the organization of private secondary schools used as agencies of public instruction as contrasted with the organization of comparable public schools.
6. Analysis of various special types of organization not sufficiently represented in the present study to allow detailed investigation; in particular analysis of—
   (a) The 4-year junior high school organization within unit enrollment groups.
   (b) The undivided 5-year high-school organization within unit enrollment groups.
   (c) Secondary-school organizations forming parts of 11-grade public-school systems.
   (d) Secondary-school organizations which include junior college units.
7. Detailed investigation of the factors which cause individual secondary schools either notably to exceed or notably to fall below the norms for organization

of schools of their type and size. (Study of this problem may properly be a phase of the validation of norms. On the assumption that certain norms have been accepted as valid, it is here suggested as a problem in the determination of causal relationships.)

8. Detailed study of methods by which schools necessarily handicapped either in size or in type of organization may improve their organization.
9. Further evaluations of various types of organization in schools falling in enrollment groups not adequately represented in the present study; in particular study of schools separately classified—
   (a) In subdivisions of average grade enrollments below 30.
   (b) In subdivisions of average grade enrollments above 333.
10. More exact analysis of the differences in organization between large and small schools by a segregation of schools in type groups and a determination of the differences between large and small schools common to all the type groups.
11. Investigation of the maximum effective size of school under various types of organization.
12. Study of the relationship between effectiveness of organization and per-pupil outlay for items immediately associated with organization.
13. Recurrent studies of school organization, according to methods similar to those employed in the present investigation, to provide—
   (a) Facts concerning the status of school organization on a Nation-wide basis, in the light of which progress in organization may be determined periodically.
   (b) Periodic data on the relationships of the various elements in the national program one to another.

B. Subjects suggested for further investigation for which few or no data have been gathered in the present study.

1. Study of the relative holding power of schools of various sizes and types over a period of years.
2. Investigations of the relationship between differentiation in salary schedules among separate units of the school system, and—

(a) Articulation between the units.
(b) Pupil achievement in the separate units.

3. Study of the relationship between the sources of support for extracurriculum activities and the scope of the extracurriculum.
4. Study of the relationship between the effectiveness of homogeneous groupings, and the use of—

(a) Semiannual as contrasted with annual promotions.
(b) Promotion by subject as contrasted with promotion by grade.

5. Investigation of the effects of extreme departmentalization in the junior high school grades.
6. Comparison of both the administrative and the educational effects of various types of curriculum organization.

In a letter written subsequently to the publication of Monograph No. 5, Francis T. Spaulding suggests the following additional subjects for investigation:

1. What is the effect on over-age elementary school pupils of special promotion to the secondary school? Though the junior high school organization contains provision for such promotion, we have thus far had relatively few reliable case studies of the pupils concerned. A careful check of the results of junior high school practice in this connection would be of much value in gaging the effect of this phase of secondary school organization.
2. What are the effects on pupils' elections of various types of curriculum organization—constants and variables, multiple-curriculum, or a combination of the two? This problem represents one aspect of the problem listed as B–6 in appendix B to Monograph No. 5. There is the possibility and the desirability of comparing the wisdom of pupils' preliminary (independent) elections of courses in schools which present practically identical curriculums organized according to different schemes.
3. To what extent do differences in the type of school organization affect pupils' social and moral attitudes? Both during the survey and afterward I encountered strong opposition to the 6-year type of school organization on the ground that the contact between the younger and the older pupils was undesirable from the standpoint of the younger. By testing pupils both in 6-year schools

and in separate junior and senior high schools some evidence could be gained as to the extent to which the difference in organization seems to be accompanied by a difference in the development of attitudes.

4. What is the effect on (1) scholastic accomplishment and (2) persistence in school of (a) comprehensive high schools as compared with (b) specialized high schools?
5. What are the observable effects of nonpromotion in high-school courses? So far as I know we have no careful and comprehensive study of nonpromoted pupils. One needs to be made before we can know the whole truth about the bugaboo of "failure."

In part III of Monograph No. 5 descriptions are supplied of innovational reorganizations of the elementary-high-school-junior-college period of training, aimed principally at shortening the time, integrating the work, or both. The plans described are, generally speaking, considered experimental by persons in charge of systems following them. They are indicative of ways in which the problems of integration and shortening of the period of training are being approached in some subjects and activities in a few schools. The issue of improved articulation is especially important in this connection. Obviously there is opportunity for application of the same techniques or of new ones to additional subjects and activities in numerous other schools. What has been done is a mere beginning, although a very important one, in the field of experimentation with reorganization plans.

Smaller Secondary Schools

An essential problem for investigation concerns means by which popularization of secondary education in rural areas may be extended without adding materially to the number of small high schools. Studies already made indicate that popularization increases as the number of high schools grows. Proximity of residence is therefore indicated as an important factor influencing high-school registration in sparsely settled areas. It probably is not the only important consideration; certainly factors such as transportation and tuition payments are thought to exert an influence. The high-school dormitory

has been tried with success in some places. Many more investigations need be made of factors which have an effect on high-school registration and attendance in rural regions.

When the various factors operating to reduce pupil attendance in sparsely settled communities are known, their effects evaluated, and remedies for them developed and tested, it may be found practicable to organize into larger school units without reducing registrations—possibly even with an increase in enrollments from rural territory and with educational services provided for age groups not now in school. In a small school it is not only the school that is small; classes are also small. Organization should make it possible to increase the size of classes or groups assigned to each teacher.

Curriculum expansion in small high schools has been studied extensively but is still far from solved. There is no lack of evidence that the curriculum of the small high school is principally academic. The problem is how in a practical way it may be enlarged. Reorganization of subject matter, especially in the direction of fusions of existing subjects, may hold a possibility of expanding the offering without adding to the number of classes to be taught daily. A flexible daily program calling for more independent work by pupils would result in fewer class recitations in each subject, thus saving teacher time which could be applied in expanding the offering. Much experimentation is needed with correspondence instruction, itinerant or group teaching and supervision, larger units of district organization, and other methods which may offer possible solutions. Itinerant services of other kinds, such as in health work, guidance, and library facilities, are also appropriate subjects for experimentation.

The extracurriculum offers a somewhat similar field for study. The activity offerings of a small school are limited in scope and as organized at present offer little opportunity for expansion since so few teachers are available for their supervision. One of the perplexing problems here is to find ways by which experiences which are essentially social in character may be made available in situations where under present organization there are few participants.

A fundamental problem in small schools is that of securing an adequate staff and of attracting and retaining efficient personnel—principals, teachers, supervisors, and clerical assistants. A few schools have been successful in this regard. Research can be useful to administration in showing the ways by which personnel problems in small schools have been solved.

A fact which should not be overlooked is that there is no likelihood of the small high school being eliminated in the near future through consolidation into larger units. The number of very small schools is steadily decreasing, and it is reasonable to suppose that this trend will continue, but indications are that the small high school will be with us for many years to come. It is therefore important not only to solve some of its problems by developing it into a larger unit but also to continue our efforts toward improvement in its educational services as a small school.[3]

Secondary Education for Negroes

Early in the monograph on education for Negroes it is pointed out that this is essentially a status study with attempts to emphasize outstanding practices as these may be discovered. Since the monograph deals with all phases of secondary education for the Negro race, the suggestions for research studies given throughout the present bulletin are pertinent to Negro education, with the important addition that study of Negro secondary education needs to be in the nature of basic investigation of educational services suited to the demands of Negro life and culture. Among the more important needed investigations the following are mentioned in the monograph as especially fruitful fields for study:

1. Further study of the accessibility of secondary-school facilities for Negroes in certain localities, counties, and States.

[3] A publication which indicates how one community solved many of the problems encountered in its small high school is Educational Monograph No. 7 of the University of Nebraska entitled, "The Chester six-year high school," by Knute D. Broady, Earl T. Platt, and Dean Mooney.

2. Factors affecting the variation of support of secondary education for Negroes in the different counties and districts of certain States.
3. Factors affecting the elimination and retardation of Negro secondary school pupils.
4. Influences and trends of curriculum changes in individual secondary schools.
5. A vocational education survey for Negroes, including a study of vocational guidance and vocational opportunity.
6. A Negro student personnel study at the high-school level.
7. Availability of elementary education for Negroes in selected States and communities in relation to secondary and higher education.
8. In the light of 5, 6, and 7, an intensive investigation of programs of studies and curriculums of Negro high schools.

Dr. Caliver, author of Monograph No. 7, has recently suggested the following additional needed studies in the field of secondary education for Negroes:

1. The relation of the kind of certificates held by Negro secondary school teachers to their actual teaching job.
2. The relation of the training of Negro secondary school teachers to the courses they actually teach.
3. A study of the articulation between secondary schools and colleges for Negroes.
4. A study of the content and methods of teaching representative courses in secondary schools for Negroes.
5. History of secondary education among Negroes.
6. Trends in the reorganization of secondary education for Negroes.
7. The provision of extraeducational services in secondary schools for Negroes.
8. A study of citizenship training in secondary schools for Negroes.

District Organization

To appreciate fully the problems involved in the school district organization of any one State one must have well in mind the historical background of present conditions. Few States have been able to approach the issues of school organization through a complete revaluation of the existing district system. In most cases plans initiated for drastic reorganization of local school administrative units have failed. The most significant advances have been made through carefully perfected planning attended by full recognition of the pecu-

liarities to be found within the State. In Louisiana and Utah the people have sought and have supported from the beginning the large parish and county school unit, while in New York, Pennsylvania, and certain other States the people have resisted practically all movements that tended to destroy the small school district. The sociological, political, and economic factors that lie back of and that foster the different types of school districts in these States present fertile fields for research and investigation.

While the last sentence of the paragraph from Monograph No. 8 quoted above refers specifically to certain States mentioned in the paragraph, it seems reasonable to conclude that the social, political, and economic factors related to district organization in numerous other States are worthy of careful study; especially is this true at a time such as the present when so many formerly accepted views are being revised.

The general report on district organization closes with a listing of considerations which it is suggested those interested in improving district organization should take into account. While stated in the form of conclusions, it must be realized that every one of these principles opens up a field for fundamental research in district organization as applied to local school units. The list of considerations follows:

If efficient schools are to be economically operated, no area of a State should be created as a school district unless it can produce a school population sufficiently large to warrant the operation of the complete minimum educational program established for the State.

No school district should be allowed to exist that does not have resources sufficient to maintain the complete minimum educational program with such additional assistance as may be allocated equitably to all districts from a State equalizing fund.

Every school district in the State should be of sufficient size to warrant the employment of a professionally qualified superintendent of schools and a supervisory staff.

The type of school-district organization is closely associated with public-school support. Any proposed modification in the plan for distribution of State subventions should be studied in relationship to the school-district organization.

Since the population and resources in various sections of a State are subject to modification, and since the means of transportation are also constantly improving, school-district

boundaries should be made flexible. This is essential if schools are to be conveniently adjusted to the changes that are taking place in the areas which they serve.

Much greater progress in the administration of secondary schools would be made if each State would consider the present school-district organization as experimental in nature. Selected districts might be designated as experimental centers for the study of the advantages and limitations of plans in operation and those that are proposed and to serve as demonstration school systems in order that the people may have the opportunity to visit and to judge from observation the relative effectiveness of different types of school-district organization.

The methods used in studies of certain district organizations in California and Illinois described in parts II and III of Monograph No. 8 are applicable to situations elsewhere, especially to those involving consolidation of schools into larger district areas.

As this is written a significant investigation is under way of district organizations in 10 States. The investigation referred to is a Federal project under the direction of the Office of Education and is known as the "Study of Local School Units." The number of school administrative units in the 10 States cooperating in this study varies greatly, the largest number of such units in any State being approximately 12,000 and the lowest 167. The distribution of schools by number of pupils enrolled and number of teachers employed is correspondingly great. Evidence is certainly present that significant variation in school-district organization exists. The summary reports now in preparation by each of these 10 States will supply much significant material not only in the way of conclusions but also in the form of suggestions for students of distinct organization.

Laws and Regulations

The laws and regulations affecting secondary education are undergoing continuous change and are therefore in need of constant study. The Office of Education attempts to supply this service, but its efforts are in frequent need of supplement, especially as regards the regulations, which are subject to more frequent change than are the statutes.

Much original research needs to be conducted into fundamental issues which should determine how the laws and regulations are to be developed. For example, the laws governing payment of tuition and transportation of pupils have received treatment in Monograph No. 9 and other studies. A State legislator would, however, be likely to find himself considerably confused in attempting to develop a plan for tuition and transportation payments in his State on the basis of such findings as are available. Opportunity exists for excellent evaluative studies seeking to establish the advantages and shortcomings under different conditions of the various plans in operation as regards both tuition and transportation. In addition, safety in transportation of school children is only a partly solved problem as is evidenced by the record of accidents. The research worker in education can do much to indicate how transportation may be safeguarded.

The basis for allotment of school funds to high schools is another subject on which research could be helpful to the legislator attempting to develop a plan for his State. Data on practices are of value in that they suggest a variety of ways in which the problem may be approached, but they are confusing in their variety and prove especially bewildering because of the lack of studies indicating the results to be expected from the various ways of allotment.

The gradually increasing legislative control of the public-school curriculum has become a perplexing problem in the administration of secondary school courses of study. Investigations which would reveal the extent and nature of such legislative control and would supply also an evaluation of the specific changes which it has brought about in the high-school curriculums in the various States would be of value in connection with future legislative proposals in this regard.

Articulation of High School and College

In chapter II of Monograph No. 10 is given a report on present-day methods of admission to college both for regular and for special students. The large variety in criteria used

both singly and in combination with other criteria offers about as conclusive evidence as anyone could desire that there are no generally recognized standards in the field of college-admission requirements. Apparently, while numerous studies have been made in this field, more need to be made before anything approaching evaluation of admission methods will be available. Dr. P. Roy Brammell, author of Monograph No. 10, says:

> The actual reliability of individual criteria, or various combinations of criteria, and of no criteria at all needs to be determined. It needs to be demonstrated whether or not traditional entrance standards are worth the trouble they entail.

A similar conclusion may be reached regarding subject requirements for entrance to college. Many of the studies which have been made cast doubt upon the significance of specific subject requirements, although there is some evidence that certain types of subjects have predictive value. The practice, rather generally followed, of prescribing certain subjects for college entrance is in need of evaluation; the evidence is far from conclusive in its favor and tends in fact to throw suspicion upon the belief that completion of certain specific subject requirements constitutes any guarantee of success or of probable success in college work.

Much information regarding the students is assembled by higher institutions. However, the type of information which is gathered and recorded and the uses made of this information seem to be guided more by personal opinion, size of the college, public or private control, and the like, than by any viewpoints which result from more scientific or at least more objective procedures. The problems surrounding orientation and adjustment of students as they enter college are far from solved.

Closely related is the problem of differentiated instruction in college freshmen courses. Here also it is important that the procedures be tested in order that the heavy mortality in beginning college classes may be reduced.

Toward the end of Monograph No. 10 Dr. Brammell lists problems and closes his discussion with the following two paragraphs:

Suggestions as to how articulation may be improved and the means of improvement in effect in numerous institutions were presented in chapter IV. Some of these practices, particularly the one in which the secondary schools and higher institutions cooperate in comprehensive guidance programs, give special promise of solving in the main the general problem of articulation.

At the close of this study a sense of confusion prevails because of the extreme diversity among the data secured; but it is accompanied by a feeling that a few plans now in operation for the improvement of articulation are pointing in the right direction. The maze of admission criteria used at present by the higher institutions demonstrates the fact that either there are no admittedly superior standards of admission or the superiority of certain ones has been accepted on the basis of studies of isolated cases. The problem of articulation does not center and is not to be solved at the point of transition from the secondary school to college. It is more far reaching than that. A great deal of the expensive research now being carried on to determine what entrance criteria are most effective or what subjects should be required might well be turned to the task of solving the articulation problem at its source. That is to say, the abilities, habits, characteristics, interests, health, etc., of pupils ought to be studied during their secondary-school careers, and on the basis of the determined relationships of these to subsequent scholastic success, pupils should be guided into or directed away from the higher institutions. This may seem to be a task for the secondary schools only; but equally as important as this is the task of increasing, through cooperative guidance work with the secondary schools and differentiated instruction in college, the chances of success in the higher institutions. In view of the fact that past practices in general have failed to allay confusion and have not established the fact of the superiority of certain practices over others, it seems proper to hope that fair trial will be given to a few cooperative programs which touch directly and intimately the present work and future plans of the secondary school and college population.

Administration and Supervision

Numerous studies have provided limited information on the status of administration and supervision in secondary

schools. The studies of the National Survey of Secondary Education have revealed the practices of selected schools in these regards nationally. The next important step is evaluation of the various policies and practices which have been discovered.

What responsibilities should be borne by various administrative and supervisory school officers, such as the board of education, the superintendent of schools, the principal of an individual high school, the supervisors of instruction, and the like? What activities may most advantageously be performed by each? Since the high-school principal is largely relied upon for supervision of high-school instruction, how may he arrange his administrative work so as to have time for supervision? What are the most desirable practices with regard to supplying clerical service to teachers? What duties should such clerical assistants perform and what qualifications should they have? These are typical questions which may properly be asked regarding administration and supervision in the schools. They are not adequately answered by a recounting of frequencies with which the different procedures are followed, significant as data on frequencies may be. Satisfactory answers await the application of evaluative and experimental methods to the problems involved. Persons engaged in administration and supervision can do much to hasten arrival of good practices if they will try out different assignments and procedures, measuring the results and effects as they go.

Following are typical quotations from Monograph No. 11 regarding studies which may profitably be made in the fields of administration and supervision:

Considerable additional study is warranted in connection with the internal management of the business affairs of school systems and the relationships that should exist between the personnel employed in the several administrative units and in the central office to produce the best educational results most economically. The relationship of the clerks to the officials they serve in each building and to the central office becomes most important, if efficient standard practices are to be evolved and continued in operation.

The business staff in the superintendent's office and each principal must be agreed on the policies and practices that are to apply to budgetary preparation and control and to every other activity relating to the business management of the schools.

It would appear that profitable results would indeed be forthcoming if school systems would study in greater detail the types of central office supervisory organizations that are now being maintained.

A more detailed analysis of the services and activities of secondary schools must be made and more clearly defined classifications of duties must be forthcoming if administrative offices in secondary schools are to be raised to levels that will permit the proper performance of important school duties and if principals and their associates are to be raised above the clerical group of employees of a school system.

To what extent should a secondary school, operated as a unit of a school system, be independent of central office control in case there is one secondary school, and in cases where there are two, three, or more secondary schools? What constitutes desirable freedom of action and power of initiative on the part of the staff employed in each school?

To what extent should a school system maintaining several secondary schools endeavor to establish standard practices that shall govern the activities of all principals and associates in all schools?

Is it a sound administrative policy to perpetuate a plan of organization for the administration and supervision of schools without a periodic check of the organization against the services rendered?

Is it a sound policy to adopt changes in organization without a thoroughgoing study of the effect any one change may have on the personnel and the organization of the entire system?

Are there differences in the effectiveness of the teaching services and other activities in small schools as compared with large schools? In the former, teachers are required to share in all school activities, while in the latter a large number of administrative officers are employed and many teachers have in large measure only their teaching duties to perform. In other words, what effect does the centralization of a function have on the performance of that function and the performance of other functions closely allied to it?

Monograph No. 12 supplies needed data on requirements placed upon candidates for teaching positions, agencies through which suitable applicants are located, methods by which information regarding applicants is secured, and procedures which are reported as being followed in selecting, appointing, and retaining teachers. The monograph covers the practices surrounding employment of teachers. There is room for a companion study of practices successful in bringing about elimination of weak teachers from the schools, or better still in eliminating poor prospects from training courses in teacher-training institutions. A number of suggestions on this latter point were made by Raleigh Schorling in the School of Education Bulletin of the University of Michigan for January 1934. In all investigations of appointment and elimination of teachers, care needs to be exercised to secure the actual practices, not merely reported procedures.

The monograph closes with the following statement:

> This and other studies show that new teachers are located, selected, and appointed by a variety of procedures. As yet, however, little real evidence has been published to show which of the methods are most effective in obtaining competent teachers.
>
> It is, therefore, needless to say that further study should be made of the problem of teacher selection. Additional study of present practices in locating, selecting, and appointing teachers may not be needed, but it seems evident that studies to ascertain the best criteria for predicting the future success of inexperienced teachers and for appraising the work of teachers already in service should be undertaken by some educational agency. Several questions need to be answered. Among these are: (1) What constitutes teaching success? (2) How may future success of inexperienced teachers be predicted? (3) How may the success of teachers in service be measured? When these questions are answered the problem of teacher selection will be well on its way to solution.

It appears that the first need is for clearer statements and more satisfactory measures of what constitutes

teaching success. Some work has been done in this field, but more needs to be done. It may be that the development of such statements and measures awaits the employment of refined judgment by competent observers to an extent not found in studies available at the present time. It may be that entirely new techniques for measuring teaching efficiency must be developed. When they are developed it should be possible to determine more accurately the relationship between teaching success on the one hand and academic training, professional training, experience, personality traits, and the like on the other. Such investigations should make it possible more satisfactorily to select and retain efficient teachers and to eliminate weak teachers from the service. Ultimately a more confident selection of students for training as teachers may result or at least elimination from teacher-training courses of students who are not likely to succeed as teachers.

Individual Differences, Marking, and Promotion

The review of literature on homogeneous grouping presented as chapter I of part II of this monograph reveals that so far as controlled studies of homogeneous grouping are concerned "the era of grubbing for facts in this and related fields has only begun." Despite the great amount of literature available on the subject of homogeneous grouping, only eight significant studies have attempted to approach the problem from the angle of experimental and controlled groups. Obviously this check on theories of grouping is entirely inadequate. The inadequacy becomes especially apparent when one considers that the only fields or subjects investigated at all are English, history, mathematics, French, and general science; that no controlled studies have dealt with any pupils or subjects of the eleventh and twelfth grades; that taken together the studies have involved relatively few teachers and fewer than 3,500 pupils; that no experimental study has extended over more than a year and

only two over more than a semester; that the tests used were an inadequate measure of the important educative changes which presumably might have taken place in the pupils during the period of experimentation; and finally that owing to variations in conditions of the investigations and in techniques employed it is futile to attempt to reach any summary finding by adding the results of one investigation to those of any other.

The study reported in Monograph No. 13 answers as fully as need be the question: What significant procedures in grouping and special classes are being followed by outstanding schools? Neither it nor any other study in existence offers adequate solutions to the numerous problems surrounding bases of grouping and assignment to special classes, levels of grouping, grouping in different subjects and subject fields, development of prognostic tests in the various subject fields on the basis of which pupils may be assigned to different groups, measurement of outcomes (especially outcomes other than scholarship), grouping within class sections as contrasted with homogeneous classes, grouping through assignment to special schools as contrasted with grouping within schools, class size in relationship to ability groups and special classes, and modifications in curriculum content and teaching procedures for groups or classes at different levels. In recent years increasing doubt is being cast upon the fundamental soundness of the principle of grouping or segregating normal pupils into separate schools or into different classes. Entire batteries of well-coordinated studies need to be trained on grouping problems if they are to be solved; they will not be reduced by desultory guerilla attacks.

On page 36 of Monograph No. 13, Roy O. Billett says that "the composite picture suggests a progressive decrease in the advantages of homogeneous grouping as the intelligence quotients of the pupils increase." This conclusion has such important implications for practices with regard to homogeneous grouping that it would

appear desirable to conduct further studies to learn the extent to which the hypothesis is true.

The development, organization and evaluation of curriculum materials and teaching procedures to care for the capacities and interests of individual pupils is seen by Dr. Billett as a "fundamental unsolved problem." The specific issues which he raises are placed in part II of Monograph No. 13 dealing with plans characterized by the unit assignment, but they are of general significance for the whole movement toward caring for individual differences:

1. What do the subject-matter specialists regard as the real contributions which study of their subject matter may make to the growth of the individual? How may these contributions be classified under the headings of concepts, attitudes, appreciations, knowledges, or skills?
2. How are these concepts, attitudes, appreciations, knowledges, or skills ranked by capable adults who are not subject-matter specialists, from the standpoint of their importance; their range of use; the difficulty of acquiring them; the desirability of acquiring them in certain subject-matter fields rather than others or even entirely outside the school?
3. To what extent may principles of differentiation and adaptation of subject matter be obtained from the analysis and interpretation of psychological studies reported in educational literature, of studies of children's present needs and immediate interests to be made through interviews with the children themselves and through observation of their present normal activities, and of studies of probable adult needs?
4. Do these studies suggest a certain organization and sequence of subject matter which will be most consistent with the pupil's normal process of growth?
5. What minimum essentials should be required of all pupils and to what extent is it necessary to retard the progress of the slower pupils in order that thorough mastery may be assured?
6. What should be the content and method of honor courses in each grade for the very capable or gifted, of courses for the superior but not gifted, and of courses for the normal pupil?
7. How can tests be developed, the passing of which will constitute entirely adequate grounds for excusing pupils from certain phases of a course or even from certain courses?

8. How can the work of all subject-matter fields be correlated and integrated?
9. How can the products of learning be adequately and economically measured?

Two principal methods have been evolved in American education in caring for individual differences. One of these looks toward breaking the school population up into groups and instructing the groups separately. Of this nature are special schools, special classes, and homogeneous grouping. Administrative organization is necessary to achievement of these purposes. The other way which may or may not be attached to those already enumerated involves dealing with pupils individually rather than in groups. It includes the methods which Dr. Billett groups together as plans characterized by the unit assignment. It can be put into operation by an individual teacher without far-reaching administrative changes. For certain kinds of materials, certain pupils, certain teachers, and certain communities one plan may be vastly superior to any other. What sorts of materials, what kinds of pupils, what types of teachers, and what classes of communities? These are fundamental questions for research to answer.

Few school practices are subjects for investigation more frequently than marking and promotion. Witness the large number of studies leveled at failures, retardation, acceleration, types of marking systems, distribution of marks, factors influencing teachers' marks, and the like. It is true, however, that much of this research is of methods rather than of fundamentals. Research is needed to ascertain more definitely the accomplishments and traits for which separate marks should be awarded and to develop marking techniques which the typical teacher can use and, having used them, feel that the mark given is a reliable and valid index of what it purports to measure. Little available research, moreover, deals with the educational effectiveness of substitutes for ordinary marking systems, with evaluation of methods directed at reducing or eliminating failures, and with substitutes for the system of basing promotion on the earning of a specified number of units, counts, or hours of work.

Monograph No. 14 contains case studies of 10 outstanding guidance systems. These are found principally in larger cities and larger schools. Similar information needs to be gathered regarding guidance services in small schools. Furthermore, the studies of the National Survey of Secondary Education were made in 1930 and 1931. Programs established or materially modified since that time may prove especially significant in view of the necessity during at least a part of this period of operating guidance services on greatly reduced budgets.

One important field for study in guidance is the individual pupil—his interests, background, aptitudes, and abilities. Much work has been done; but the field is so extensive, the conditions so varied, the new discoveries so frequent, and the need for knowledge of individual pupils so insistent that nothing short of continuous study can be considered satisfactory. The work leads into testing of all kinds, prognostic work, and development of records which are useful to guidance officers and teachers. Since the need for such studies is unceasing, the techniques for study are no less important than the findings themselves.

A significant phase of guidance relates to occupations. In order that vocational guidance may be wisely given, it is necessary for the counselor to have knowledge not only of the pupil but also of occupations. Consequently there is an extensive field for study in analyzing occupations, especially in discovering what are the specific duties and responsibilities of persons engaged in the various occupations.

Mental hygiene is a phase of guidance work almost universally regarded as important, but almost as universally overlooked or at least understressed in the schools. Studies are needed of school systems which are effective in their adjustment efforts with a view to discovering how the work is organized and conducted and how the classroom teachers are trained and supervised in order that they may make the important contributions which they can make in this field.

The studies should concern not only the ways of discovering and treating cases of extreme maladjustment, but should also reveal the means employed for assisting normal pupils to develop well-balanced, healthy personalities.

A study of investigations in guidance made by Kefauver and Davis [4] reveals that in the judgment of leaders canvassed evaluation of programs for guidance is the kind of research most needed at the present time. The evidence of such investigators as Reavis and Woellner and Koos and Kefauver leaves no doubt that numerous schools have developed programs for guidance; a next step greatly needed is evaluation of programs, whether regularly established or experimental, by following groups of students through their school and post-school careers and measuring the effect of the guidance given.

Interpreting the Secondary School to the Public

In a letter Belmont Farley, the author of Monograph No. 16, says in part:

There are three fields in which I think research in educational publicity should be made as soon as possible: (1) Exhibits; (2) home visitation; (3) radio.

Very little has been done in any of these three fields to discover what type of presentation is most effective and what kind of information is best suited to the medium. There is a real need to direct the people interested in publicity away from the newspaper as the only agency. I do not mean to minimize its importance, but there are a number of neglected fields and I think the three I have mentioned are among them.

If I had an opportunity, I would experiment in these fields:

1. The building of a publicity program instead of merely reporting one that happened. By that, I mean that there are many events that can be planned purposely to make publicity possible. The publicity man's most effective work is done by planning publicity into an event, not by merely taking advantage of publicity that is incidental or accidental.

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[4] Kefauver, Grayson, and Davis, Albert M. Investigations in Guidance. Occupations, November 1933. *See also* the Review of Educational Research for April 1936 on the subject Pupil Personnel, Guidance, and Counseling.

2. Comparison of the effectiveness of emotional and inspirational types of publicity with types that are more factual and based primarily upon the results of research or careful investigation.
3. The selection of mediums and the preparation of materials best suited to the interpretation of various school subjects such as English, history, mathematics, physical education, and so on.

A planned publicity program requires some balance between the different subjects and services of the school. There is a tendency to overemphasize in the publicity program certain subjects and school activities. While there are often reasons for special emphasis, usually extra space and attention devoted to one school service at the expense of others is the result of poor planning. It may be that technics in advertising will be helpful in determining the effectiveness of certain kinds of copy for publication and of the use of certain mediums for the interpretation of the different school subjects and services.

It seems to me that a definite part of the publicity man's field is knowledge of the attitude of the public toward education. I would like to undertake a study of this attitude in various ways, one of which would be the result of asking intelligent and sympathetic persons what they would prefer to include in or eliminate from the training of their own children. Then I would like to compare the replies to this query with what citizens who are not parents would like to see provided for the education of other people's children.

The technique used in Dr. Farley's study for evaluating the general publicity program through testing parents for information which they have concerning the schools is applicable to any specific policy or practice which may be put into operation for interpreting the schools, not only to patrons but also to pupils and teachers. A thoroughgoing investigational program of this nature would involve a series of well-coordinated studies, and when completed it should yield measures of the relative effectiveness of each of the various important types of publicity utilized in the schools. The success of any given policy, practice, or device of interpretation followed in a school or group of schools may be judged, at least in part, by whether those to whom the publicity was addressed have acquired the information or attitude which it aimed to con-

vey. Obviously also the effectiveness may be judged by whether in the past the features supported by publicity have been introduced. Moreover, the relationship of various types and means of publicity to those programs which have been adopted and to those which have failed of adoption may be significant as indicating which publicity methods are successful and which are ineffective.

The Library

Monograph No. 17 contains a section on recommendations for further study. It is quoted here in full:

School library problems are much discussed in educational and library periodicals. An examination of the literature reveals, however, that few research studies have been made in attempting to throw light on the vital issues of school library administration. Objective investigations of several pressing problems would undoubtedly make important contributions to the school library movement. A number of studies of this type are suggested:

1. Many and various in character are the library standards which have been set up by States and by other school-accrediting bodies. No compilation of standards has as yet proved completely satisfactory; no set of standards has been developed on the basis of scientific evidence regarding the library requirements of schools; and in no case has a statement of standards been announced which adequately recognizes the qualitative as well as the quantitative aspects of school library service. The problem is one which demands both extensive and intensive study.
2. Extensive studies are necessary to determine the effect of the newer methods of classroom teaching on the use of the secondary-school library, and particularly important are experimental investigations of procedures for adapting the library to the newer methods of classroom teaching.
3. Many interesting devices and activities are reported by high-school librarians, but no one knows the actual effect of these devices or activities upon the use of library materials or upon the reading habits of the pupils. A series of studies to appraise various methods of encouraging recreational reading would perform a genuine service in helping to determine what devices to use and which to

discard. For example, what influence does the regularly scheduled free reading period have on pupils' recreational reading habits?

4. Much discussed is the problem of the relation of the library to the study hall. Data reported in the present study indicate that the combination library-study hall encourages the use of library materials. Continued study needs, however, to be made of this problem. In such investigations as are carried on, consideration must be given to the objections which many librarians are raising to the library-study hall plan.
5. Little cooperation is reported between school and public libraries. Few high-school librarians report receiving assistance from public libraries, and even fewer secondary school librarians report performing activities to assist public libraries. The problem of the relations of the school library to the public library demands extended investigation in order to determine the respective functions of these two types of libraries and in order to set up programs for effective cooperation between school and public libraries. The problem is one which might well be investigated by a committee of school and of public librarians.
6. The problem of book selection in the high-school library needs further investigation. How can the book collection in a high-school library be evaluated? What criteria should be adopted in selecting books to be ordered?
7. The entire problem of instruction in the use of books and of libraries demands investigation. Can the value of such instruction be objectively demonstrated? What should be included in a course in library instruction? In what grades of the school ought the various units of instruction be given? Who should give the instruction, librarians or teachers? These questions must be given the same careful study that is being given other branches of the school curriculum.
8. Throughout the country the relation of teachers to the library is receiving much attention. If teachers are not led to make effective use of library materials, the school library can at best achieve only a small measure of success. Most librarians are making conscious efforts to encourage teacher use of the library, and in many schools effective programs of teacher-library cooperation have been set up. In general, such difficulties as are reported appear to center around the fact that teachers fail to

realize the resources of the library. This situation is, it would seem, one which must be attacked during the college days of teachers in training. A much-needed investigation is that of provisions which teacher-training institutions are making and can make for instructing their students, first, in the use of libraries, and, second, in the use of library materials as an aid to teaching in the secondary school.

9. The problem of the training of secondary-school librarians requires careful investigation. Should the librarian be trained as a teacher? If so, what courses in the field of education ought she to pursue?
10. This investigation succeeded in bringing to light a number of devices and procedures reported to be successfully used in outstanding secondary-school libraries. The sources of such devices are far from exhausted. Continued study of outstanding practices on a much more inclusive basis than was possible in this survey would undoubtedly succeed in bringing together numerous additional ideas of value alike to school librarians, teachers, and administrators. Such studies should make real contributions to the further improvement of the secondary-school library.

Two library problems probably are encountered by the school administrator more often than any others. They concern the selection of books and the utilization of the library.

The problem of selection of books and other materials, such as clippings, records, pictures, and art subjects, is a recurring one owing to the large number of publications and new processes which are constantly appearing and which consequently are making older materials out of date. For instance, revised book lists are needed periodically. In making selections, whether of books or of other materials, it is important to apply as valid techniques as are available or can be developed. The new is not necessarily better but the new is worthy of consideration.

The question of utilization of the library has many phases involving use by teachers, pupils, and others in the community. The classroom library is one of those phases. The problem of utilization of the library in the small high school is another. The effectiveness of use of public-library

facilities by the schools is a third phase involving problems of location, control, personnel, etc. Similarly the contribution which can be made by county libraries to school needs offers an inviting subject for investigation. A question opened up in Monograph No. 17 deals with the relationship of housing to utilization. In Dr. Johnson's study libraries are classified into three groups according to housing, namely, library and study hall separate, library and study hall together, and library and study hall connected by a door or passageway. Utilization by pupils was far inferior in the first type to that in the second; limitations of the study made it impracticable to measure utilization under the connecting-door plan. A study of utilization under this plan comparable in technique to that made by Dr. Johnson would be opportune.

Procedures in Curriculum Making

The study reported in Monograph No. 18 presents detailed data on practices followed by States, counties, and cities in developing and revising their courses of study. Throughout the investigation attempt was made to secure evaluations of the various procedures from the persons reporting them. These evaluations are in the form of subjective judgments of participants.

Especially significant for those contemplating further investigation of procedures in curriculum making is the summary of evaluative judgments presented at the end of chapter IV of Monograph No. 18. As revealed there, judgments approach unanimity on such matters as the desirability of participation by as many teachers as possible and the need for making the conditions right for such participation through training of teachers and through providing time for curriculum study and work. However, judgments on numerous important subjects there listed are in need of much corroboration before they can be considered safe guides for action.

In many cases it should be possible for research workers to evaluate the success of different procedures in a more

objective way. The practical question may be raised, for instance, as to the most effective ways of organizing for attack on curriculum problems. The study reveals a wide variety in practices with regard to selection and assignment of personnel for both direction and production. The variety in judgments concerning success of the various practices is almost as diverse as the practices themselves. No one will believe that only one effective method of selection and assignment of personnel exists. On the other hand, not every problem is local and individual. The problems of various localities in this regard are undoubtedly much more similar than dissimilar.

Another field for further evaluative study concerns the agencies which can most effectively assume specific responsibilities in connection with the revision program. Still another series of problems centers around the selection and organization of materials. Who is ready to express himself with any considerable degree of certainty regarding the most satisfactory methods of selecting subject matter and of coordinating the subject matter of course outlines? After the course is prepared, how may it best be tried out under classroom conditions and reactions secured for its further revision? What means are most effective in training teachers to use the new courses to the best advantage?

Program of Studies

A technique used extensively in the studies reported in Monograph No. 19 is that of following the programs in the same schools over a period of years to ascertain what additions, subtractions, and changes in emphasis have occurred with the various reorganizations and revisions which have taken place. Obviously information with regard to trends can be kept up to date only by recurring studies of present offerings. The data reported in Monograph No. 19 were gathered largely in 1930. In view of changes brought about since that time, it is desirable to have further national investigations on comparable bases made of present status in order that later trends in programs of studies may be determined.

Studies of present and past practices with regard to offerings do not, however, indicate the extent to which these offerings reach the pupils. A study of subject registrations provides such a measure. A study of registrations may be of the type described in division III of part I of Monograph No. 19, where the pupils have finished their high-school work, or it may be a study of registrations by pupils enrolled in the school at any given time.[5] In the case of pupils who have been graduated, such a study offers opportunity for investigation also of the sequence and continuity in the programs of individual pupils—a most important feature and one frequently omitted in investigations of programs of studies.

Recurring throughout the chapters of Monograph No. 19 are classifications of the ways in which programs of studies are administered. The effects on pupil election resulting from different ways of organizing and administering programs of studies open up wide areas for investigation. What is the effect in the subjects pursued by pupils of the multiple-curriculum type as contrasted with the constants-with-variables type of program? What are the advantages and disadvantages of the combination type of program as shown by pupil elections of subjects? To what extent does the general curriculum meet a need in allowing for exploration of interests and to what extent does it more or less needlessly postpone educational and vocational decisions which should be made before the pupil reaches the end of his high-school course? These and other influences on pupil election of subjects allow of more than philosophical discussion, since the results can be studied in the programs followed by pupils now and in the past.

No student can be oblivious to the important changes which may be overhanging the program of studies as a result of research and experimentation undertaken in numerous schools by such agencies as the Department of Secondary

[5] Among studies of registrations are those to be found in Annual Reports of the Commissioner of Education beginning in 1890 and ending in 1915. This series was continued in the Biennial Survey of Education, 1920–22, and again in the bienniums 1926–28 and 1932–34. More detailed data regarding registrations are needed especially with regard to the grade placement of the pupils taking the various subjects.

School Principals, the Progressive Education Association, the College Entrance Examination Board, and the North Central Association of Colleges and Secondary Schools. Insofar as the revisions attempted in these and other studies are successful and to such extent as they are adopted, they will render obsolete the present program of studies and the research findings based on it. Some of the facts regarding the new programs have been assembled in a fairly satisfactory way; others are in need of much more interpretation and evaluation than has been given them. Furthermore, try-out and scientific evaluation of new types of programs of studies and new integrations of subjects and subject fields should appeal to those who believe that the most important next steps will be through experimental approach rather than through statistical compilation of present and past practices.[6]

Subject Fields

Investigations applicable to more than one field.—The expansion which has occurred in the curriculum during the twentieth century has made it inevitable not only that new materials must justify their incorporation but also that traditional content must show reason for its retention. Curriculum research must be importantly concerned with weighing the values of both old and new. Administration obviously cannot escape making decisions as to what is to be included in the curriculum; research, therefore, cannot avoid responsibility for advising administration concretely and specifically what is of value and what may without serious loss be omitted.

Supported strongly, in certain quarters, for inclusion at the present time are education in safety, thrift, character, sex, narcotics and stimulants, peace, conservation, a multitude of vocational subjects, certain foreign languages, and additional materials in social studies, science, fine arts, and health. The movement to put the extracurriculum into the curriculum visions important additions to the content of

[6] The reader is referred to an article by Arthur K. Loomis, one of the authors of Monograph No. 19, appearing in the Bulletin of the Department of Secondary School Principals for April 1935.

courses. Suggestions for elimination, while not so numerous, are far-reaching in fields which have maintained themselves the longest such as, mathematics, history, and foreign languages. Frequently these attempts at expansion or reduction are initiated and supported by representatives of pressure groups which, however sincere their motives may be, often bring a partisan and therefore a somewhat unbalanced viewpoint to bear on curriculum subjects and course content. The curriculum research specialist must protect the curriculum, on the one hand, from exploitation through undesirable propaganda subjects or "snap" courses and, on the other, from a too strong adherence to traditional content and an undue resistance to change of any kind.

Another type of study relating to selection of material applies not to selection of subjects but to selection of content within courses. Much work has been done here with analyses of topics treated in textbooks, content of courses of study, and pupil interests. Without disparaging in any way the excellent work which has been done, it may be said that there is need for more research into fundamental values and placement of present and proposed curriculum materials. While no one set of methods of investigation are applicable to all subjects and all conditions, common elements exist to such an extent that the techniques used in approaching the problem in one subject are suggestive of methods of investigation which may be used in other subjects.

In addition to studies aiming at determination of what should be included and what should be excluded, there is a large field for study of how curriculum materials should be organized. Calling for continuous study are problems related to the sequence of courses, the nature and sequence of topics within courses, the relationship which subjects and subject fields bear to one another, and the development of curriculum content involving not only fusion of courses but also fusion of fields. The motive of modification in the organization of the curriculum enters strongly into the adjustments made by the 30 secondary schools which are cooperating with the Progressive Education Association's Commis-

sion on the Relation of School and College. Experimental and demonstration schools connected with universities and colleges as well as numerous other secondary schools are continually trying out new ways of correlating, integrating, and fusing curriculum content into "core" curriculums. Work in the popular field of fusion demands both a thorough knowledge of content in each of the various courses or fields to be integrated and an overview of the entire curriculum field; no plan for development of fusion courses can be successful unless it brings to bear both of these abilities in the personnel charged with responsibility for curriculum revision.

A third important group of problems for investigation by the curriculum research worker concerns the presentation of curriculum materials. What has been done in investigating teaching methods may at first sight appear formidable, but the inadequacy of research in this field becomes more and more apparent the further one looks into what is available. Even for such moot questions as the direct method in foreign languages or the relative advantages of individual, small-group, and demonstration experiments in laboratory science, the studies made are greatly limited in number and are usually restricted to certain classes of one instructor covering a portion of a year's work in one subject. The methods of these studies are excellent—so excellent that they should be applied to many more cases in order that defensible findings may result and in order that subjects which are not even touched at present may enter the experimental area. The field of teaching methods is in need of an experimental approach more extensive than has yet been witnessed in educational research. The extension will include not only more researches on more subjects but also more schools, more teachers, and more pupils participating in each experimental undertaking. Only in the field of testing of achievement has a coordinated and cooperative experimental attack been adopted widely by curriculum workers.[7]

[7] For excellent reviews of literature on the curriculum the reader is referred to curriculum numbers of the Review of Educational Research. The latest number on this subject is dated April 1937.

For the large majority of high schools and high-school teachers, curriculum problems are primarily problems within subject fields. Consequently among the studies of the National Survey of Secondary Education were investigations of instruction in English, social studies, science, mathematics, foreign language, music and art, and physical education and health. Each study was pointed toward examination of available courses of study and the recommendations contained in them on such subjects as objectives, organization, content, and teaching procedures. The quotations and discussions which follow indicate research investigations needed in the subject fields mentioned above.

English.—The author of the monograph on Instruction in English suggests the following problems for consideration:[8]

1. What should be the relationship of high-school English to the general objectives of secondary education?
2. How far does the present program in composition and in literature meet the present or the future needs of adolescent boys or girls?
3. To what objectives other than mere correctness should the composition courses contribute?
4. To what extent does the present program in English grammar influence speech and writing? What is its relative importance in an overcrowded program of instruction?
5. Granted that a pupil is of low intelligence and has but a year or two to remain in school, what program of English instruction will contribute most to his future welfare and efficiency?
6. What is preparation for college; that is, what are the actual demands of higher institutions? To what extent should they dominate secondary school practice?
7. Is there a common body of literary materials with which all pupils should be familiar?
8. What are *minimum essentials* and on what bases should they be selected?
9. Granted that the major objectives of the teaching of literature are breadth of experience and interests, and a habit of lifelong association with good books, what literature

[8] *See also* the 34th Yearbook of the National Society for the Study of Education. In the chapter entitled "Diagnosis of Difficulties in English", Dora V. Smith, author of Monograph No. 20, gives a list of needed research studies.

content and what methods of classroom instruction are best calculated to achieve these ends?

Social studies.—The schools have accepted the obligation to emphasize American principles of government. The social-studies subjects which have the largest registrations are, in order: American history and government, world history, and community civics. It will be noted that the first and third of these deal with American institutions of government.

The grade placement of different social-studies materials and experiences is a perplexing problem. No pronounced unanimity exists with regard to grade placement of the principal subjects in the social-studies field; and when the content of the social-studies curriculum as a whole is considered, the amount of overlapping and duplication is very apparent. Here, because of the frequent changes and the unstandardized nature of the content, research needs more than in any other subject field to show the way toward correlation and integration.

Since so much of social experience should be gained outside of books, it becomes especially significant to determine with precision which elements may most effectively be gained or strengthened through contacts with organizations and through participation in extracurriculum activities. Moreover, the related practice of marking pupils on civic traits and school citizenship involves careful consideration of values and dangers inherent in ratings on attitudes, ideals, and opinions.

In chapter II of Monograph No. 21 are listed a number of problems with regard to social studies. In a letter written after the appearance of the monograph, William G. Kimmel, the author, suggests the following problems for investigation by those conducting research in the social studies:

1. Extended and intensive analyses of materials in textbooks, syllabi, and the like in terms of values in content generally agreed upon by specialists in content.
2. Evaluation of all kinds of teacher aids, pupil aids, workbooks, etc., again in terms of values in content.

3. Investigations of visual aids of all types, with intensive analyses of their accuracy, worth, and feasibility.
4. The possibilities and limitations of the radio in terms of the social studies, especially with respect to symbolism, propaganda, distortions of materials, and the like.
5. The "unit" as a plan for organization of materials.
6. The education needed by prospective and present social-studies teachers in general, special, and professional fields.

The chapter on summary and conclusion implies throughout the need for fundamental studies on combinations of subjects, arrangement of materials, and sequence of courses in the social-studies field. Fusion courses in the junior high school and in problems of American democracy, 1-year world history and 2-year sequences in European history, minimum and optional assignments, methods of teaching and testing, supplementary reading lists, and the relationships of the social studies to contemporary life and to national and international affairs are problems which call for much more research than has been done.

Science.—The conclusions of significance to future research reached from the examination of courses of study in science are reported by Wilbur L. Beauchamp in Monograph No. 22 as follows:

The analysis of courses of study and classroom observation indicate certain practices which may be considered as innovating and hence should be carefully examined and evaluated by those who are engaged in curriculum building and who are desirous of improving instruction in science. These practices are as follows:

(a) A shift has occurred from the organization of courses in terms of topics and subtopics to organization around certain major ideas or concepts. These ideas may be generalizations or principles of science or important ideas underlying the understanding and control of certain phases of man's environment.

(b) A shift has taken place from the topical method of developing a topic to the problem method of development. Each problem is focused on some important idea or generalization of science.

(c) A greater emphasis on the interpretation of the environment is observed in the more recent courses. This is

indicated in the courses in physics and chemistry by a more marked emphasis on the qualitative aspects of the science with an accompanying decrease in emphasis on the quantitative aspects.

(d) A widespread use of illustrative material supplied by newspapers, magazines, and Government bulletins was also observed in all science classes.

(e) The use of the classroom period for oral recitations has been replaced to a considerable extent by the use of the period for study purposes under the supervision of the teacher.

(f) The introduction of materials to serve as study guides is apparently widespread. These take the form of mimeographed guide sheets, containing directions for study and exercises to solve, and commercially printed work books. A study of the guide sheets indicate that the first formulation usually consists of a large number of questions focused on the various facts presented in the text. A marked similarity exists between these questions and the questions asked by the teacher in the oral recitation. Revision of this first set of guide sheets usually results in a great reduction in the number of exercises. The exercises of the revision are centered on ideas involving the use of facts rather than upon the accumulation of a series of facts. Work books vary in their emphasis. Some of them have not evolved past the first stage of development. The use of work sheets and work books undoubtedly has resulted in a greater emphasis on pupil activity and a consequent decrease in teacher activity.

(g) The more recent courses of study include a much greater number and variety of suggestions for teaching than the older courses. This appears to be a recognition of the principle that the products of a given course are largely dependent upon the method employed. This is a distinct shift from the older viewpoint which assumed that a course of study consisted solely in the enumeration of the content to be covered.

(h) Teacher or pupil demonstration has replaced individual experimentation to a marked degree in the junior high school. A great increase in the use of the demonstration is also observable in the specialized science courses.

(i) The laboratory work in the specialized sciences has, in the past, often been divorced from the work in the textbook. The organization of courses in terms of problems requiring a synthesis of the laboratory results and data from the textbook, has unified these two aspects of instruction. The solution of problems has been elevated to the focus of

attention. The data obtained from the laboratory and the textbook are thus used as sources of data. This has resulted in some schools in a decreased emphasis upon the formal record of laboratory experiments. This shift in emphasis has been accelerated by the use of the demonstration method.

(j) More attention is being given to visual aids than ever before. Experiments have shown the value of films and slides for imparting information. In some schools a large portion of the instruction is carried on through visual aids. It appears that there is some danger that too great an emphasis upon visual material may neglect two of the fundamental objectives of science teaching, namely, the inculcation of the scientific attitude and increased efficiency in critical thinking.

This list of innovating practices does not necessarily indicate the changes which should be brought about in the teaching of science. The trends do, however, disclose the variations from the dominant practice which may well result in progress and which, as already stated, should be given careful consideration by those who are undertaking the improvement of instruction in science at the secondary-school level.

In a letter Dr. Beauchamp comments as follows on studies especially needed in the teaching of science:

1. Investigations made concerning the relative efficiency of individual laboratory work and classroom recitation have assumed that the major function of the laboratory is to illustrate and clarify principles and facts of science. Tests which were devised measured this aspect almost exclusively. Laboratory work should also focus on increasing accuracy of observation, increased ability to use data and knowledge in drawing conclusions, and increasing ability to check the conclusions drawn. Before we discard individual laboratory work, investigations should be made measuring the relative value of individual work and demonstration in attaining these objectives.
2. Our courses in science attempt to teach a large number of principles. For example, the typical high-school course in physics presents 90 principles. Usually these are merely taught to the point of apprehension, that is, to the point where the pupil catches the idea. If a principle is usable, the pupil requires a great deal of practice using the principle as a basis of explaining his environment. Investigations should be made to discover the amount

of practice required really to master a principle and to discover how many principles can be taught effectively during a school year.

3. One of the major aims of the teaching of science is an increased ability to use the scientific method. Very little attention is focused directly on this ability in the majority of classrooms. It is assumed that it is an automatic concomitant of the study of science. Investigations concerning the possibility of increasing ability to employ the scientific method by direct focus upon it should be made.

Mathematics.—The National Committee on Mathematical Requirements in its report on The Reorganization of Mathematics in Secondary Education, issued in 1923, recommended that mathematics be a required subject in grades 7, 8, and 9, and that the courses be reorganized to include materials not usually found in pure arithmetic and algebra courses. The extent to which this recommendation has been followed, both as regards the character of the courses and the requirement that all pupils take them, offers an important field for investigation. Such limited studies as have been made seem to indicate that the recommendation has not been extensively adopted by the schools. If thorough canvass of the situation should show this to be the case, it would indicate that clearer evidence needs to be presented to educators as to the results secured from organization according to the plan recommended by the committee.

A movement is present in the mathematics field looking toward teaching the essentials of mathematics used in everyday life and omitting other materials except for those whose later careers will call for specialized knowledge of mathematics. While progress has been made, much work of an evaluative character needs yet to be done in developing differentiated work for those intending to follow walks of life in which specialized training in mathematics is not necessary, for those who are not going to college but expect to follow some pursuit calling for the practical use of mathematics, and for those who plan to enter college and prepare themselves for some profession involving the use of higher

mathematics. The aspects of mathematics needed for these different types of life careers have not been determined with sufficient accuracy. After the topics are determined there remain still the problems of organization and sequence in order that the materials may be most advantageously placed and developed both for further study, such as in subsequent science and mathematics courses, and for life careers.

No special listing of topics for investigation appears in the Survey Monograph on Instruction in Mathematics. However, the treatment accorded the following topics implies strongly that they offer fruitful fields for research:

Objectives, especially disciplinary aims.
Work which should be required in mathematics.
Order of topics.
Values of separate courses and of *fused* mathematics courses.
Correlation with other subject fields.
Development and testing of visual aids, practice methods, reteaching and relearning materials, and unit plans of teaching.

Foreign languages.—Two extensive studies, namely, the Classical Investigation and the Modern Foreign Language Study, have exerted important influences on educational practices in Latin and modern languages; this is especially true in the case of the classical investigation which has been published for a sufficiently long time to make its influence felt in the schools. The time is ripe for a more thorough evaluation than has as yet been made of the results secured in Latin classes operating on the reorganized plan.

The grade placement of foreign languages is a problem which needs further investigation. This also should be an evaluational study since the answer to the problem is certainly not to be found in the present practices of schools; the time for beginning study of the various foreign languages ranges all the way from the seventh to the eleventh grade. In connection with investigations to determine the time for beginning the study of foreign languages it is well to remember that the effects and results of such study in the junior high school probably extends much farther than is revealed by a

tabulation of the number of years pupils thus initiated into foreign language study continue the subject.

In the junior high schools is a large variety of exploratory and general language courses. Judgments regarding the values of these are approximately as diverse as the courses themselves. Research may with reason be expected to supply in the near future a better evaluation of these courses and their possibilities for improvement than the school administrator can find at the present time. Similarly appraisal needs to be made of the values attaching to foreign language courses covering various periods of time. For instance, credit is not ordinarily allowed for less than 2 years of study of a foreign language; it is pertinent to inquire whether credit should not be granted for 1 year of foreign language study or, on the other hand, why the minimum requirement should not be raised to 3 or 4 years.

Dr. Helen M. Eddy, the author of Monograph No. 24, in a letter suggests the following specific studies in modern languages:

1. Compilation of frequency lists of forms, and syntax material needed for the development of reading ability.
2. Compilation of lists of the vocabulary, forms, and syntax material necessary for the development of a minimum adequate speaking and writing ability.
3. Compilation of basic vocabulary lists that take into account the semantic character of words.
4. Further experimentation to determine student knowledge of cognates in the various modern languages.
5. Selection and organization of material to teach the cultural objectives.
6. Continuation of the production of scientifically graded reading material in the various languages.
7. Continuation of experimentation for developing methods of acquiring reading ability.
8. Experiments to determine the relative value of intensive and extensive reading.
9. Experiments to determine the amount of oral and aural training advisable in a course in which the primary objective is development of the ability to read the foreign language.
10. Continuation of experimentation in the field of the psychology of language learning.

11. Further refinement of tests to measure achievement at progressive stages in the development of reading ability.
12. Construction of reading tests which will adequately test ability to comprehend the thought of a paragraph as a whole, rather than single words, phrases, and sentences in a contextual setting.
13. Tests to measure attainment of the cultural objectives.

Similarly, the following problems are suggested for the attention of those conducting research in Latin:

1. Investigation as to whether extensive or intensive reading is the most effective way to bring about reading knowledge of Latin.
2. Experimentation to determine the effectiveness of a recognition knowledge only of vocabulary, forms, and syntax for acquiring the ability to read Latin.
3. Comparison of the functional versus the formal method of teaching the elements of Latin, the criterion being reading knowledge measured both by translation and tests on comprehension.
4. Experimentation to determine the value of writing English into Latin for acquiring the ability to read Latin.
5. Experimentation in the production of scientifically constructed and correctly graded reading material.
6. Construction of frequency lists in vocabulary, forms, and syntax from a wide range of Latin literature, taking into account range as well as frequency.
7. Compilation of difficulty lists for words, forms, and constructions as shown by the actual errors of students on objective tests.
8. A study of pupil knowledge of Latin-English cognates with a view to determining what Latin words the pupil will be assumed to know from his knowledge of English.
9. Experimentation to evaluate the effectiveness of the "oral" method in gaining a reading knowledge of Latin.
10. Continued experimentation as to the most effective method of presenting and learning new Latin words.
11. The development of tests to measure a recognition knowledge of forms and constructions.
12. The further refinement of objective tests to measure ability to read Latin.

Music and art.—The fine arts as curriculum material are much newer than fields already treated; consequently courses in music and art are standardized to a lesser extent than in

the older subjects and the body of available research is more limited. Aside from investigations relating to values of different courses, content of courses, required work, tests, and the like, opportunity exists for study of objectives of fine arts which differ somewhat from those emphasized in other subject fields. Fine arts are justified to considerable extent on aesthetic, emotional, and ethical grounds, and they presumably contribute in a marked way to education for leisure-time pursuits. To what extent these objectives are attained or may be attained through school work in the fine arts, both required and elective, is a subject for investigation by the research specialist.

The author of that part of Monograph No. 25 which deals with music made no special listing of subjects for investigation, but the following quotation points the way to certain problems for study:

> While working out the appropriate offering and methods, it seems further desirable to select a nomenclature which is descriptive of all courses carrying the same subject matter. The 96 courses of study examined for this report revealed 54 different titles for music courses offered in the secondary school, while 38 courses bore no specific designation. Analysis of courses in many cases showed duplication of materials with only the nomenclature being different. There is also little agreement in the time allotted to the same offerings in different schools. Credit allowance shows like disparity.

Two paragraphs of a letter received from Anne E. Pierce, author of the part of Monograph No. 25, dealing with music, are so rich in suggestion that they are quoted here:

> The entire music program offers rich opportunity to the research worker. What courses are essential? How should they be worked out? In general, what should be the content? What should be the objectives of music training in secondary schools and how should they be worded so as to explain to all just what is to be accomplished? How should courses be worked into the school day? What courses are desirable for the small high school, for the larger one? What credit should be given for music work? How can individual differences be cared for in the music class? Methods and materials should be carefully studied to discover what is worth while and what is not. The general

music class in junior high school is usually an example of poor teaching in music. Much should be done on this level.

Specific topics that might be mentioned are: Pupils' interests in music at different age levels (what songs they like to sing, what instrumental compositions appeal to them); music reading; creative music (original compositions); instrumental class instruction (how to teach all instruments in one class, how to care for beginning pupils in the band and orchestra along with more advanced players); vocal problems (range of voices at different periods, how to develop correct intonation in a choral organization, how to help the problem singer sometimes called the monotone, how to teach voice in classes); integration of music with other subjects; radio in the classroom.

In the part dealing with art the following investigations are listed:

1. (*a*) A comprehensive study of the art curriculum as it exists in secondary schools; (*b*) research on the extent to which a knowledge and appreciation of art functions in adult life; (*c*) the development of a proposed curriculum based on this research (a beginning toward this was made in Minneapolis in 1932).
2. A study of the influence of training on ability in art by comparison of paired groups of those who do not take art with those who take it in the high school. This study would also include a comparison of different methods of instruction.
3. A study in methods to determine how to conserve self-expression and creativeness typical of the elementary-school child and still gain skill in technical values of which pupils in secondary schools feel need.
4. Research in the psychology of self-expression, imagination, and creativeness, including analysis of these experiences, leading toward the development of tests for their discovery in pupils, and experiments to determine methods to develop these qualities.

Among additional research studies in art education suggested by Robert S. Hilpert, author of the part of Monograph No. 25 dealing with art, are the following:

1. The current aims and objectives of art education in the high schools.
2. The needs for art information and art skills in the daily life of high-school pupils.

3. Revision of terminology pertaining to art education.
4. A technique of art instruction which will carry the experiences of the children beyond the schoolroom.
5. Degrees to which it is advisable and profitable to require teachers of the accepted and established high-school subjects to add art instruction to their teaching, not as a separate and specialized subject, but as an integral part of traditional subjects.
6. Degrees to which emphasis should be placed on:

   Enjoyment and appreciation of art wherever found.
   Originality in manipulative activities—design, drawings, etc.
   Feeling and emotional content.
   "History" of the art heritage from the past.
   Correlation and integration with the established school subjects.

7. Degrees to which the manipulative activities in art classes should be supplanted by "lectures", discussions, and required readings similar to assignments in other high-school subjects.
8. Studies to determine whether there are relationships between:

   Appreciation and skill in art.
   Appreciation in one art with another (music and art).

Health and physical education.—The subjects of health and physical education are also comparative newcomers in the curriculum organization. There are, therefore, numerous opportunities offered for significant studies on features which have already been canvassed to a considerable extent in older subjects.

In addition these subjects are sufficiently different in character from the usual curriculum subjects to call for investigations of somewhat distinct type. Evaluation of course content here as with other subjects is in order, but in addition there is the problem of program content which includes numerous health services and activities not to be confused with classwork. Moreover, studies are needed in course organization and program organization, relationship between the health program and physical education, relationship of both to the athletic program, personnel, services to be sup-

plied and activities to be engaged in, contests, equipment, and tests and examinations designed to measure both the condition and the progress of individual pupils.

The last paragraph in Monograph No. 28 points the way to two important groups of problems which in the judgment of the author will occupy the attention of workers in physical education and health:

> Two shortcomings were reported by workers in health and physical education more frequently than any others. These probably indicate the trend which work in this field will take in the future. They are the tasks which lie ahead. One of these shortcomings is the lack of effective programs of correction in physical education and of proper follow-up to facts brought to light through various tests and physical examinations. The other shortcoming is the failure to measure the effectiveness of the general programs in this field, the methods of instruction, and the materials used.

The Extracurriculum

The extracurriculum has had a varied development. Introduced apologetically, almost surreptitiously, it has taken on more and more respectability until now many of its proponents support it for inclusion in the regular daily schedule of the school. There are, of course, those who, remembering well its condition in bygone days, regard it with suspicion and only grudgingly give it a place even outside the school day.

Some activities originally regarded as extracurriculum in nature have by changing their names and dressing up in different clothes presented a sufficiently good appearance to be accepted in the best curriculum circles. Many courses in dramatic art, journalism, and public speaking would in days gone by have been called by such names as class or school plays, school paper or school annual, and debate; as such they would have been considered extracurriculum in character and would have competed with one another for the time which pupils could give to them outside the school day. It would seem that a good opportunity is presented for comparing the differing conditions and effectiveness with which they exist and operate, since some schools now admit them

into the curriculum while others still regard them as extracurriculum.

Where attitudes are so diverse and judgments so varied, research has a special responsibility for supplying reliable data on which programs can be built and defended. An unusual opportunity exists for checking of values achieved against values claimed for the extracurriculum. One of the chapters in Monograph No. 26 closes with the statement that the analysis of practices "reveals a decided need for self-examination and internal evaluation designed to ascertain the extent to which the maximum benefits of the activities are realized for the pupils through present programs and to lay the foundation for substantial improvement in those programs."

A technique described in chapter V of Monograph No. 26 supplies a measure of the value of activities through ascertaining the extent of carry-over of participation from high school to college and adult life. Additional studies of this type should prove valuable. In addition, present values of participation in extracurriculum activities should not be overlooked.

The extent and variety of activities have probably been canvassed sufficiently well by recent investigators. The facts regarding participation have also been adequately gathered, but the methods by which both overparticipation and nonparticipation may be avoided are in need of further study.

Contests growing out of extracurriculum activities are a controversial feature. Their values are frequently drawn in question and certain types of contests such as interscholastic basketball for girls are rather generally condemned by health authorities. Research needs to be aware, however, that mere elimination of contests in one or several or all fields does not constitute a solution of the problem. The competitive spirit is strong and has much to justify it; certainly it cannot be ignored. If research should decide that contests, as we have them, should be eliminated or greatly restricted and modified, research must also take responsibility for developing substitutes for contests. Such contests as are retained offer special problems.

In Monograph No. 27 the following research undertakings in intramural athletics are mentioned specifically:

1. Careful study of intramural athletic activities in secondary schools having enrollments of 100 to 300 pupils.
2. How to organize and promote games having large carry-over value, and games designed to take care of pupils not included in contesting groups.
3. The correct placement of games by grades.
4. Determination of the maximum number of contests in individual sports in certain sized schools, in keeping with the goal of self-directed free play.
5. Careful evaluation of plans for the organization and administration of intramural sports programs, of systems of financial control, of personnel arrangements, and of the contribution of certain games to projected goals.

In table 31 of this same monograph is presented a list of problems pertaining to interscholastic athletics reported by 327 selected schools. The following comment on the table indicates the problems which are most frequently encountered at present and which probably are most in need of attention by research workers:

> . . . According to these data, the outstanding difficulty connected with a program of interscholastic athletics is the fact that too few pupils derive benefit. This problem is at present troublesome to more secondary schools (160) than any of the 27 other problems listed. One hundred and one schools indicate that there is a tendency at present for their communities to rate the success of the school in terms of athletic success. Six other problems rank comparatively high when the number of schools reporting them to be prevalent problems is considered. These are (1) conduct of spectators during contests; (2) pupil transportation and the conduct of pupils on trips; (3) eligibility of participants; (4) detraction from school work; (5) physical hazards to contestants; and (6) encroachment on school time.

The viewpoint that the educational program should be regarded a unified whole of which the curriculum and the extracurriculum are important parts involves the research worker in a host of problems related to snap courses, credit allowance, time assignments, requirements for graduation,

and minimum and maximum participation. While the status in these and other regards has been investigated on a number of occasions, the advantages and disadvantages of various practices still remain largely matters for subjective judgment, and decisions regarding extracurriculum policy are consequently too strongly conditioned by the experience or inexperience of school administrators or by the assumption that the majority way is the best possible way.

The relationships of health programs, physical education, intramural athletics, and interscholastic athletics offer interesting problems for research. It would appear from Monograph Nos. 27 and 28 that solution for many of the problems respecting coaches and coaching, competition between unevenly matched pupils, training for teams, athletics for girls, corrective exercises, and the like are to be found in a close integration of programs and personnel in health and physical work. Careful evaluation of results in schools operating on different plans will indicate to what extent such a conclusion is justified.

Conclusion

The discussions of research problems in the pages which precede have not been developed with any thought that they are comprehensive and all inclusive.[9] They are problems within the fields treated in the National Survey of Secondary Education which are not adequately solved by present research and still are judged to be susceptible of solution in whole or in part by available techniques or by new methods that can be developed from information and experience at hand. It is hoped that they may prove suggestive to research workers and that the manuscript may have some influence in directing concerted attention on some of the important problems in the uncharted, changing, and growing field of secondary education.

[9] In February 1937 the National Committee on Research in Secondary Education released a mimeographed circular entitled "Problems and Questions in Secondary Education Suggested for Investigation." It lists nearly 1,000 suggestions for research studies gathered from school administrators, college professors, and other students of research.