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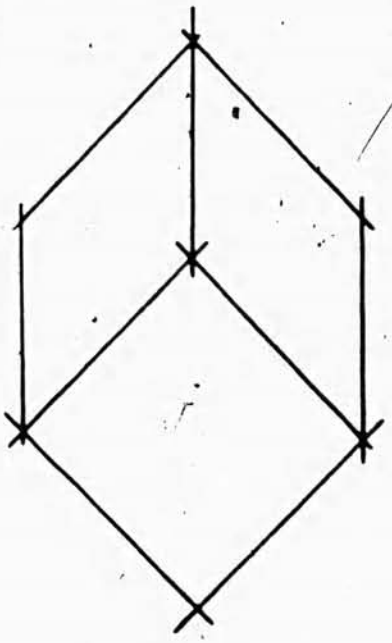
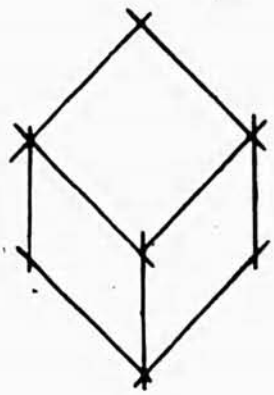


An Approach to

Individual Analysis

in Educational and Vocational Guidance



by

DAVID SEGEL
FRANK E. WELLMAN
and
ALLEN T. HAMILTON

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
ARTHUR S. FLEMMING, *Secretary*
Office of Education
LAWRENCE G. DERTHICK, *Commissioner*

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Contents

Foreword

IN A DEMOCRACY a guidance program at the secondary level is always advisable; when the need for manpower becomes acute it becomes a necessity. Many feel that this need is especially acute now and will continue for some time. The reason guidance is so important is that the choice of the type of high school education and of an occupation in a democracy is a matter, in the last analysis, for the youth and his parents. Therefore, there is a decisive and urgent need to have that decision by youth made with full knowledge of his capabilities and how he may overcome any handicaps to his use of these capabilities.

The analysis made in this bulletin bears directly on the problem. It suggests a reappraisal of the significant steps in the measurement program of secondary schools in relation to the choice of educational sequences and subjects and of an occupation.

This publication has been prepared by the Guidance and Student Personnel Section, under the direction of Frank L. Sievers, Chief, with assistance from the Trade and Industrial Education Branch.

E. GLENN FEATHERSTON,
Assistant Commissioner,
Division of State and Local School Systems.

Introduction

THE MANPOWER PROBLEM facing our Nation today and for many years to come emphasizes more than ever the need for vocational and educational guidance. Supply and demand for specialized workers in various occupations in our society have at no time in the past reached the serious proportions of the present situation. In a democracy the choice of an occupation and the choice of a school curriculum must be permissive giving students and their parents freedom of choice which is not always consistent with the manpower needs of the Nation.

This democratic principle must be maintained in any program designed to alleviate the critical manpower problem. We cannot tolerate any proposal which provides education for the needs of the Nation without due regard for the developmental needs of the individual student. The educational needs of our society and of the individual must, therefore, be met within the framework of our democratic structure.

There are several rather obvious situations which contribute directly to deficiencies in meeting manpower needs and in fully developing the educational and occupational potential of students.

1. Many students do not attend school long enough to prepare for an occupation or to develop their potentialities.

2. Many students are not aware of their educational and occupational potentialities and opportunities.

3. Many students are not sufficiently motivated to pursue educational activities and occupational goals consistent with their potentialities and opportunities.

4. Educational and occupational choices are frequently made with almost complete disregard of reality.

A substantial number of students drop out of high school at or below the tenth grade. Approximately 35 percent of those entering the ninth grade do not complete high school, and another large group goes through high school avoiding on the one hand direct training in vocational education and on the other the sequences in high school

which will prepare them adequately for college. Therefore, about 50 to 60 percent of our youth are ill-prepared for any particular advanced training or for any occupation requiring specialized skills or competencies. Then, too, many students who are adequately prepared for college do not enter college.

There are two important courses of action which high schools may take to hold students in school and to encourage the scholastically capable students to continue their education beyond high school. One is to develop curriculums which are appropriate to the needs of students and that prepare them for successively higher level educational and vocational activities. The other course of action is to provide the guidance services needed to enable wise student choices in curriculums and occupations and to stimulate motivation to remain in the appropriate sequences. The guidance needs demand at least two specific provisions. First, students must be informed of the world of work and of educational opportunities and be motivated to study thoroughly those decisions essential to their educational and occupational future. This may, at least partially, be accomplished in social studies classes, group guidance work, and through the use of interest inventories to stimulate thinking about these problems. Second, an accurate estimate should be made of the scholastic potential and the general aptitudes of all students so that the counselors and others can assist students and their parents in making more appropriate educational and occupational plans. In fact, without this information and counseling, an occupational information program might even increase the number of unrealistic or inappropriate choices of courses and occupations. Many students are primarily interested in well-paying occupations that seem to have an unusual quota of glamour. If the choice of curriculums is based entirely on the description of these programs without due consideration of the desired qualifications, many students will be disappointed and discouraged, and will ultimately withdraw from school.

This bulletin outlines an approach in guidance designed to estimate and utilize characteristics of students at the seventh- to ninth-grade level which should increase the effectiveness of educational and vocational guidance work. The original question which prompted the writing of this bulletin was, "How can we improve the selection of students for vocational education (in high school)?" Upon analyzing the situation, it was concluded that much better "selection" or better "guidance" for aiding students in choosing vocational courses

was needed and could be attained. However, it was also concluded that guidance for this particular purpose should probably be considered a part of the total school guidance program and not as an independent and highly specialized procedure. This approach should be helpful, therefore, in the process of educational planning for all students irrespective of their ultimate educational and occupational goals.

FRANK L. SIEVERS, *Chief*,
Guidance and Student Personnel Section.

Section I. The Need for More and Better Educational and Vocational Guidance

EDUCATORS and those having to do with manpower problems as well as psychologists and psychiatrists will testify to the special need of increased educational and vocational guidance facilities. The New York State Education Department has stated:[1]

> The establishment of an adequate guidance program in all secondary schools must take place without delay. The varied interests and abilities of youth now attending high school make necessary a thorough study of each individual before the school can plan appropriate educational and vocational programs which will meet the needs of the individual pupils.

Berdie[2] stated:

> It is important for both the student and society that a boy with an I. Q. of 190 obtain the most appropriate training, but also it is equally important that 100 boys with I. Q.'s of 125 and 1,000 boys of 100 I. Q. obtain the most appropriate training. Modern technology requires that persons at all levels be well-selected, well-placed, and well-trained. The scientist today is dependent upon his technicians, his aides, and his colleagues of lesser qualifications. For the entire social endeavor to function effectively, students most interested in and suited for accounting must be given assistance to become accountants, students most interested in and suited in glass blowing must be given an opportunity to become glass blowers. Otherwise, the efforts of the gifted few we educate will in large part be wasted.

Dugan[3] stated that:

> Choosing a career has always been a serious business. The making of correct vocational decisions is even more serious and difficult today because of the extremely complex industrial society in which we live. With more than 40,000 different kinds of jobs in our world of work and some type of specialized training required for most of these, high school graduates and beginning young workers quickly face the necessity of giving careful attention to appropriate avenues of further training and eventual life work. * * * The surest approach in overcoming the vocational choices and general misdirection of potential talent is through improved vocational guidance and counseling programs.

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[1] Improvement of Holding Power Through a Continuous Study of Youth in School. Albany, New York State Education Department, University of the State of New York Press, 1953.

[2] Berdie, Ralph F. Improving Evaluation in Student Recruitment and Selection. *Personnel and Guidance Journal*, 34: 481-86, April 1956.

[3] Dugan, Willis. Vocational Guidance. Speech made at the Science Research Associates Administrators Conference in Omaha, Nebr., Feb. 8, 1954.

One of the clearest views of the problem is that presented by McCreary in an editorial in a recent California Guidance Newsletter.[4]

> Recent statements by responsible national organizations either charge or imply that the schools are neglecting the important function of vocational guidance. The shortages of trained workers in critical occupations have focused attention upon our manpower resources, our training facilities, and upon the vital role of vocational guidance in strengthening our national labor force. The schools have been found wanting.
>
> The National Manpower Council[5] states that although "vocational guidance and counseling are recognized as important functions of the secondary school, except for a small number of communities, these functions are not being satisfactorily performed. Most students do not receive the assistance they require to make the best educational and occupational decisions * * *. The occupational information essential for sound vocational guidance is limited, and, moreover, it is frequently in a form that makes it difficult for the counselors as well as the student to use."
>
> Representatives of the American Vocational Association, an organization long friendly to the guidance movement, likewise have expressed their dissatisfacton with the vocational counseling—or lack of it—in high schools throughout the country.
>
> Apparently both the AVA and the National Manpower Council believe that in recent years many schools have so extended the scope of their guidance programs in the direction of counseling individuals with emotional and personal problems, the present staffs are unable to provide adequate educational-vocational counseling for all students. As a corrective measure, the Council has recommended that "school officials use their guidance and counseling staff primarily for vocational guidance purposes and, when expanded resources of staff and funds permit, also for counseling students with personal adjustment problems."
>
> Such charges should not be taken lightly. They merit the attention of California educators.

The period of most urgent need for guidance is when the crucial decisions are made regarding the educational programs of the student. This is normally at the eighth or ninth grade when the differentiation and choice of subjects become possible. The importance of placing particular emphasis on the interpretation of educational needs of eighth- and ninth-grade students as a basis for educational planning was pointed out by Chauncey[6] in a discussion of the identification of human abilities.

> While recognizing that identifying talent and providing guidance is a continuous process, if I had to choose a single point for emphasis it would be the eighth- or ninth-grade level.
>
> * * * at the point when the youngster is about to make the transition from the more or less common curriculum he has followed up through the eighth grade into one of the specialized high-school programs, it is imperative that he be provided with as much information about himself as can be mustered.

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[4] McCreary, William H. Are We Neglecting Vocational Guidance? California Guidance Newsletter, Vol. XI, No. 1, September 1956.

[5] Improving the Work Skills of the Nation: Conference Proceedings on National Manpower Council. New York, Columbia University Press, 1955.

[6] Chauncey, Henry. Identification of Human Abilities. *Teachers College Record*, 58: 53, November 1956.

Section II. General Principles of Educational and Vocational Guidance at the Eighth- and Ninth-Grade Level

THE SELECTION of curricular sequences at the eighth- and ninth-grade level is predicated on the following principles:

1. The voluntary selection of a curricular sequence is the privilege of each student.
2. Selection by the student of a curricular sequence and of vocational goals should be made only after all information pertinent to general *intellectual level* and specific aptitudes [1] has been made available to him by his counselor. It follows that the procedures for getting information must apply to the entire student body and not just to those who are expected to enter a particular curriculum.
3. *After the curricular sequence has been selected* other factors such as vocational interests, personality characteristics, emotional maturity, and socio-economic status, should be identified and analyzed with respect to their positive and negative influences on the full development of the curricular plan.
4. Guidance in the selection of curricular sequences consists of more than counseling. A systematic program of measurement should be carried on to get the information referred to in principle 2. Counseling is but one aspect of the guidance program and is dependent upon other procedures.
5. After a student has enrolled in one curricular sequence, there should be provisions in school regulations and guidance procedures to permit periodic reassessment of (1) the original curricular choice or decision, and (2) other personal and en-

[1] In this publication, aptitudes or special or specific aptitudes will be used synonymously to indicate the rather broad traits of abilities such as verbal, quantitative, spatial, mechanical comprehension, etc., which have been shown to have value in predicting success in various educational or vocational areas. Because of this interpretation they are referred to as aptitudes rather than abilities.

vironmental factors, to determine the validity of the chosen sequence and to determine whether a revision of plans is indicated, such as, a transfer to another curricular sequence.

6. Effective guidance procedures at the junior and senior high school levels and appropriate articulation between high schools and colleges, should reduce the need for college entrance examinations.

These six principles which were determined by a re-analysis of youth characteristics are not entirely consistent with current thinking. Yet neither can they be considered as a radical departure. The approach generally accepted might be stated as follows:

The selection by the student of a curricular sequence should be accomplished after he and the counselor have as complete information as possible regarding his aptitudes, achievements, personality traits and interests, the parents' desires, the economic status of the family, the curricular sequences, occupational fields, and the general summary of the situation as the counselor or other guidance official sees it.

Two Distinct Steps

There is one fundamental difference between the general principles of selection outlined above and the generally accepted approach. These principles propose a separation of the original choice of the curriculum on the basis of general level of scholastic ability and specific aptitudes from the analysis of other information, such as social status, vocational interests, and personal adjustment. This separation is inherent in the process stated in the second and third principles. This separation is distinct since the process suggested in the third principle should not be considered until the tentative choice of a curricular sequence has been made.

The difference in the use of the two types of data is illustrated in Chart I. In this chart, Part 1 shows the types of data which are commonly used by students and counselors in making curriculum decisions. Part 2 shows the proposed approach in which the initial decision is based on only two types of data—general level of scholastic aptitude or intelligence and the variations among special aptitudes. The consolidated use of the data given under Part 1 may tend to influence counselors and students to make curricular decisions inconsistent with the student's educational potential. Other factors, such as, social status, personality traits, and interests should, however, be given adequate consideration after the tentative curricular choice has been reached. These characteristics can then be analyzed objectively

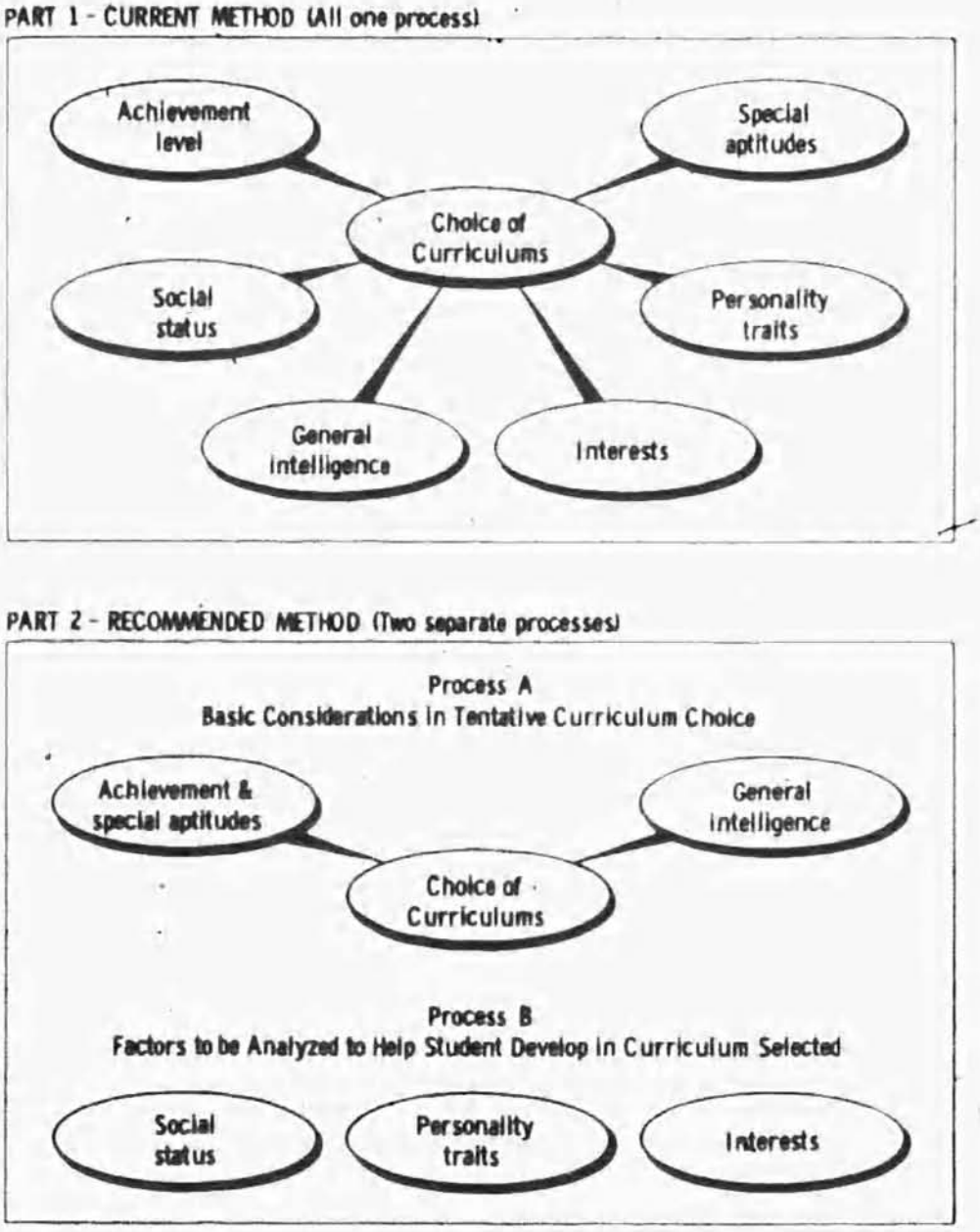

Chart I

to determine wherein they are liabilities or assets to the student and treated accordingly. The reasons for this statement and for the separation of the two steps will be discussed at length.

There is little disagreement that the main task of the secondary school counselor is in the educational-vocational guidance field. That the counselor must also assume the professional leadership in the school in dealing with all kinds of problems, including personal problems of a serious nature is axiomatic. Hahn and McLean [3] state what

[3] Hahn, Milton E. and McLean, Malcolm S. Counseling Psychology. New York, McGraw-Hill Book Co., 1955.

seems to be the prevailing thought and practice when they outlined the purpose of their book as follows:

> The purpose of this book is to focus upon counseling with individuals who are faced with vocational-educational-personal problems. There is some danger that, in so labeling this process and those problems, we and the reader may think of them as sharply separate entities, very different from other processes and problems with other names, simply because we have so labeled them. We must, at all costs, avoid this danger. It must become impossible for us to conceive of a counselee who has a "vocational" or an "educational" or a "vocational-educational" problem uncomplicated by, or unrelated to, other problems by cause or effect or both. A counselor employed by a school or college to put his major emphasis upon the vocational-educational aspects of student troubles will always find that his counselee also faces related ones in several areas, which may be labeled for convenience, personal, emotional, social, financial, health, recreational, family, marital, etc. In one case he will find that an emotional disturbance makes it difficult or impossible for the client to meet his scholastic requirements, because he is in love, or "hates" a subject for as yet unidentified reasons, or is harrassed by family quarrels. In another case the upset is caused by dull teaching, course assignments of reading and papers beyond the capacity of the most able, or poor classroom conditions of bad lighting, acoustics, or ventilation. In many instances counselees will describe their anxieties in terms of indecision or maladjustment in choosing a vocation. Probing will reveal that, in fact, the source of the worry is poor physical health, and a physician, not a psychologist is needed to clear it up.

This is the problem facing the school counselor. Careful analysis of the quotation tends to support the idea underlying a curricular choice as enunciated in this publication. Educational and vocational guidance are so interrelated and intertwined it is impossible to treat them adequately as separate entities. In fact, the same fundamental factors, namely, aptitudes and intellectual level, are given initial consideration in attempting to ascertain a sound curricular decision in either the academic or vocational field. These authors stated in the quotation that "A counselor employed by a school or college to put his major emphasis upon the vocational-educational aspects of student troubles will always find that his counselee also faces related ones in several areas, which may be labeled for convenience, personal, emotional, social, financial, health, recreational, family, marital, etc. In one case he will find that an emotional disturbance makes it difficult or impossible for the client to meet his scholastic requirements, because he is in love, or 'hates' a subject for as yet unidentified reasons, or is harrassed by family quarrels." This quotation warns that the counselor is faced not with personality difficulties, hates, or love situations as isolated and separate problems, but as interlocking factors. One of them may influence his response to every facet of life. Any approach to their solution must be made after a thorough consideration of the degree to which they ramify and affect his entire outlook.

If these personal and emotional disturbances become the primary factors of consideration in making the original curricular choice, confusion will certainly result.

It is suggested in this publication that it is essential for the school counselor to recognize the significance of *two types* of information; and that independent utilization of the two types will result in more appropriate choices of curriculums and subjects by students; i. e., the first type consisting of the fundamental or positive factors upon which curriculum choices are made (the general intellectual level and special aptitudes); and, the second type, the positive and negative influences of other factors in realizing good curricular choices.

Section III. General Intellectual Ability as a Factor

THE GREAT VARIATION in general ability from individual to individual and the variation in a distribution of mental ages or I. Q.'s for any group are well known. This variation may be shown by comparing a single grade group with the average ability levels of other grade groups. The range of variability in an eighth grade group in Evanston, Ill., is presented in Table I. The relationships

Table I—Grade level table of intellectual spread among Evanston eighth-grade students (adapted from the Illinois Study)[1]

Grade level equivalent	*Academic aptitude as measured by general intelligence (Number of students)*
13	4
12	18
11	65
10	119
9	117
8	91
7	45
6	15
5	9
4	3
3	1
	487

[1] The Nature of the School Population in the State of Illinois. Illinois Curriculum Program Bulletin No. 24. Springfield, Ill., Office of Superintendent of Public Instruction, June 1955.

NOTE: This table reads as follows: 4 out of the 487 8th-grade students had ability levels equivalent to the average 13th-grade student, 18 equivalent to the average 12th-grade student, etc.

of variations in general ability to success in high school and college and to occupational membership have been the subject of considerable research. Stewart's study[1] of the Army A. G. C. T. scores gives typical evidence on the relation of intelligence levels to occupational groups.[a] The relationship of general intelligence scores to success in

[1] Stewart, Naomi. A. G. C. T. Scores of Army Personnel Grouped by Occupations. *Occupations*, 26 : 5–41, October 1947.

school and in occupations is moderate and is seldom sufficiently high to be used in individual guidance except in conjunction with other data. Thus, measures of the general intellectual level should be supported by measures of more specific aptitudes to produce valid guidance data for individuals. The general intellectual ability level is, however, one of the two essential considerations in educational and vocational guidance.

Need for Early Interpretation of General Intellectual Ability

In principle 6 the statement was made that college entrance examinations should gradually diminish in importance as a factor in helping students decide on education beyond high school if appropriate guidance services are provided at the lower grade levels and if articulation between high schools and colleges is adequate. Most college entrance examinations are largely verbal in nature and selection based on this one characteristic eliminates many individuals who possess other aptitudes of a type which should be given proper consideration in educational and vocational guidance.

A recent study at the University of Kansas[1] has shown that the use of entrance examinations as the sole criterion of admission would eliminate many able students. The graduates of the University (not those who dropped out on the way) were classified on the basis of scores attained on an English examination and the American Council Psychological Examination which had been given to these students when they entered the University of Kansas. If the 50th percentile on either or both of the tests were used to determine admission (a cutting score which might normally have been used to screen out college applicants) a large proportion of the present graduates would not have been admitted. Chart II shows that approximately one-half of those who actually graduated would have been eliminated at entrance if these criteria had been employed. The heavy lines drawn in this table at the 50th percentile on both score distributions show that those who fell outside the upper right hand quadrant would have been eliminated.

Another reason for exercising caution in using college entrance examinations lies in the facts that many high school students capable of college work do not meet the academic prerequisites for college entrance, and that many other capable individuals do not even graduate from high school.

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[1] Smith, George B. Who Would Be Eliminated? A Study of Selective Admission to College. Kansas Studies in Education, Vol. 7, No. 1, December 1957. Lawrence, Kans., University of Kansas, School of Education.

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Chart II.—Plot of percentile scores for each of the 1006 students for the A. C. E. and English test.[1]

ENGLISH

A. C. E.	0–10	10–20	20–30	30–40	40–50	50–60	60–70	70–80	80–90	90–100
90–100	2	2	8	13	11	19	24	29	39	80
80–90	6	9	11	20	24	20	29	22	14	21
70–80	3	12	11	21	17	20	26	18	10	11
60–70	3	10	20	17	14	24	15	8	11	5
50–60	7	14	12	13	10	11	12	2		1
40–50	10	13	18	6	12	1	4	2	2	2
30–40	12	6	13	9	5	10	5	1	2	
20–30	14	22	9	3	5		2			1
10–20	16	9	11		1	1		3		
0–10	6	2	3	2			2			

ENGLISH

[1] Smith, George B., Who Would Be Eliminated? A Study of Selective Admission to College. University of Kansas publication, School of Education, vol. 7, No. 1, December 1954, Lawrence, Kans.

Note: This table reads as follows: 80 out of 1,006 graduates ranked in the upper 10 percent on these two entrance examinations, 6 ranked in the lowest 10 percent, etc.

Chart III taken from the National Science Foundation report,[2] shows the situation all too clearly. A vertical line has been drawn at an A. G. C. T. score of 110. (This score is approximately equivalent to an I. Q. of 108.) Above this score, i. e., to the right of 110 in the figure, the chance for success in college is substantial, whereas two-thirds of those below this score who enter college do not graduate.

It can be seen that there are more capable students (approximately 60 percent) who do not enter college than there are who do (approximately 40 percent). This suggests that only a minority of the more capable individuals even take college entrance examinations. This situation could be improved by good educational and vocational guid-

[2] Scientific Personnel Resources. National Science Foundation. Washington, U. S. Government Printing Office, 1955.

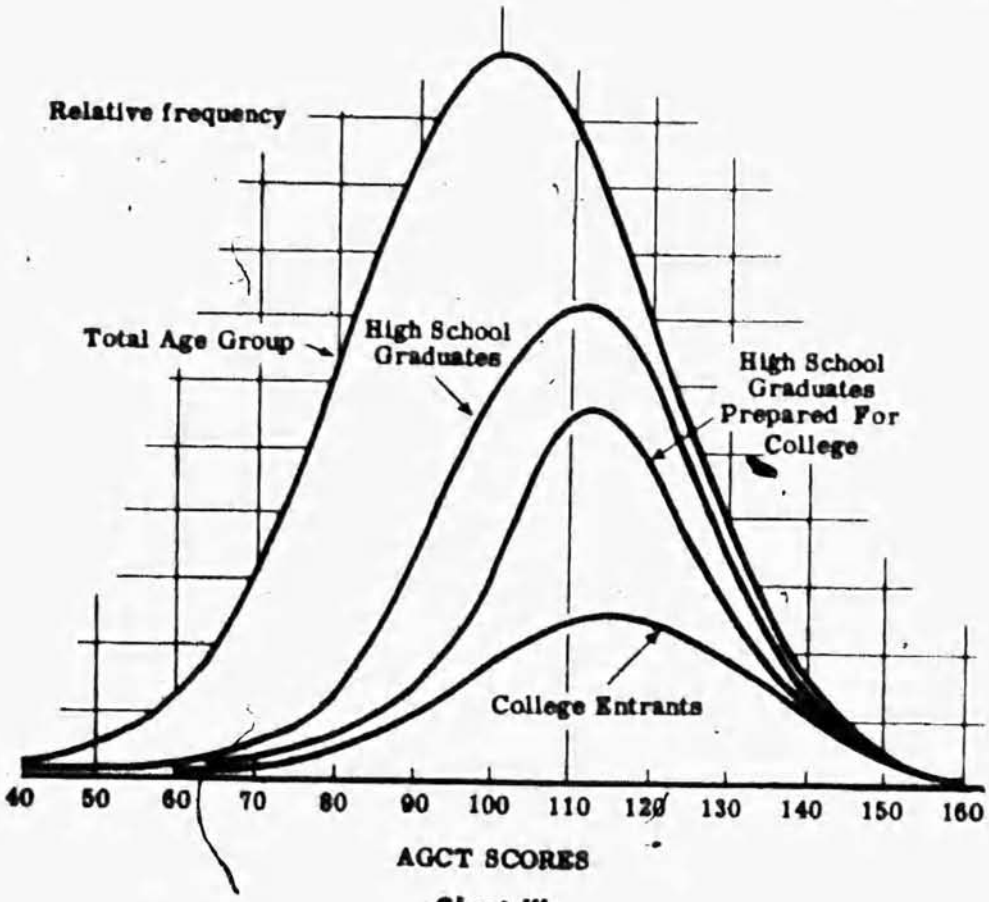

Chart III

ance for college entrance, as well as for all other educational and vocational areas, at about the eighth- or ninth-grade level. At this level most students can readily change their high school curriculum if it is not appropriate for the best development of their potentialities. Actually from an actuarial standpoint, tests of substantial reliability and validity given early in high school predict college success about as well as college entrance examinations. This has been shown by Seashore and Losee.[4]

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[4] Seashore, Harold. Tenth-Grade Tests as Predictors of Twelfth-Grade Scholarship and College Entrance Status. *Journal of Counseling Psychology*, 1: 106–114, summer, 1954.
Losee, LeNora Lillian. The Prediction of Academic Success from Ninth-Grade Achievement Records. Unpublished Master's Thesis, University of Utah, 1957.

Section IV. Variation in Basic Aptitudes as a Factor

IN RECENT years counselors and educators have accepted the importance of variations in student aptitudes. The validity of the concept of variation in aptitudes recently introduced into school practice has been summarized by Wesman.[1] In discussing the relative values of approaches with achievement tests, intelligence tests, and specific aptitude tests, he stated that:

> A third alternative is the use of differential aptitude test batteries. These batteries ordinarily include measures of verbal and numerical aptitude, just as the scholastic aptitude intelligence tests do; they also provide measures of other aptitudes as well—spatial, mechanical, clerical, and the like. The instruments yield a set of scores which recognize intra-individual differences, accepting the fact that a student may be fairly high in verbal ability, average in numerical, very high in mechanical aptitude, and very poor in clerical speed and accuracy. These multi-score batteries provide broader coverage of mental functioning than is obtainable from the more limited scholastic aptitude test.
>
> Is this broader coverage worth the effort? It depends on what the user wants to accomplish. If only the probability of success in an English class is of interest, a scholastic aptitude test might well suffice—information concerning other abilities may not improve prediction enough to be worth obtaining. If several varied criteria are of interest, as in guidance into an academic, trade or commercial curriculum, the additional information provided by differential aptitude batteries should be well worth the effort. Interest in broad and varied criteria is greatest at the secondary school level, where the pupil reaches points of decision. At this time, the pupil and the school should be considering what kind of curriculum is best for him, what are appropriate directions and levels of aspiration for the immediate and the more distant future. Educational and vocational guidance are of tremendous importance; therefore, the broadest scope of ability testing is both desirable and eminently worthwhile. True, differential aptitude testing takes more time and costs more money. A two-, three-, or four-hour difference in time, or a dollar per pupil difference in cost, should be seen in the perspective of all the years of each student's educational and occupational future. The choices to be made may well set the pattern of the student's life; information to help guide those choices warrants the additional expenditure of minutes and pennies.

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[1] Wesman, Alexander G. Aptitude, Intelligence and Achievement. Test Series Bulletin No. 51. New York, The Psychological Corporation, December 1956.

The variations in aptitudes may be derived through multipotential test batteries. The most useful of these tests are some of the newer aptitude batteries. Achievement test batteries may also contribute to the general objective of discovering variations in aptitudes. The aptitude test batteries ordinarily include measures of verbal abilities, numerical or quantitative abilities, mechanical comprehension, sense of spatial relations, and speed of perception. These instruments yield a set of scores which recognize intra-individual differences. A student may, for example, be fairly high in verbal ability, average in numerical ability, very high in mechanical aptitude, and very poor in speed of perception.

Although the use of multipotential aptitude test batteries did not come into general use until after World War II, considerable data are available on the significant differences among intellectual traits and of the relationship of the pattern of scores to success in school subjects and occupations. Before the development of these aptitude test batteries, it was necessary for the counselor to give single aptitude tests, such as reading and other verbal tests, mathematical tests, or mechanical aptitude tests. The norms for these tests were often established for specific occupational groups. For example, the score of a student on the Bennett Test of Mechanical Comprehension may be compared with the scores of persons employed as mechanics. This type of comparison can be an advantage at the twelfth-grade level when students are ready for specific occupational counseling, but usually has limited value for counseling in the eighth, ninth or tenth grades. Further, most independent aptitude tests such as verbal tests or mathematics tests, have been normed on different school populations and are not too well suited to assess relative strengths and weaknesses of the aptitudes measured.

This problem can be understood better by contrasting the standardization procedure of single aptitude tests with the procedure followed in a test battery. A test battery, for example, may consist of five tests. If these tests are to be standardized on a population sample consisting of 10,000 persons, each of the 10,000 takes all five of the tests. In the case of single aptitude tests, such as the Minnesota Clerical Test or the Bennett Test of Mechanical Comprehension, they are normed or standardized on separate and possibly quite different populations. Thus, no common basis is established to interpret the relative abilities of a student. That end cannot be achieved accurately unless the same population participated in the standardization of all the tests. Thus, it may be concluded that an aptitude test battery has greater practical value than a group of several independently standardized aptitude tests in a student appraisal program, and subsequently in counseling with students relative to tentative curricular

choices. As indicated, achievement test batteries may also contribute to the differential diagnosis and prediction of significant variation in aptitudes and these should be included in the operating procedures.

For further discussion of the advantages and disadvantages of using aptitude measures as individual tests or as batteries see Adams and Torgerson.[2]

Considerable validity data have been reported on the significant differences among intellectual traits and on the relationship of aptitude patterns to success in school subjects and in occupations.[3]

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[2] Adams, Georgia S. and Torgerson, Theodore L. Measurement and Evaluation for the Secondary School Teacher. New York, The Dryden Press, 1956.

[3] Cantoni, Louis P. High School Tests and Measurements in the Prediction of Occupational Status. *Journal of Applied Psychology*, 39 : 253–55, August 1955.

Geist, Harold. Validity of the Minnesota Occupational Rating Scales. *Journal of Applied Psychology*, 36 : 23–28, February 1952.

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Segel, David. Intellectual Abilities in the Adolescent Period. Washington, U. S. Government Printing Office, February 1951. (Office of Education Bulletin 1951, No. 1)

Wellman, Frank E. Differential Prediction of High School Achievement Using Single Score and Multiple Factor Tests of Mental Maturity. *The Personnel and Guidance Journal*, 35 : 513–517, April 1957.

Section V. Place of Other Measures in Educational and Vocational Guidance

THE GENERAL RELATIONSHIPS of some of the various types of student data to educational and vocational guidance were shown in Chart I. It was suggested that measures of personality traits, problem inventory scores, ratings of teachers, and socio-economic status be minimized in the original consideration of a curricular sequence choice. The whole gamut of abilities, interests, social status, and personality traits has rarely been interpreted effectively to help students make the fundamental educational and vocational decisions. This inadequacy is at least partially due to the involvement of so many negative or potentially negative factors, and to the susceptibility of interests, personality, and status factors to modification with maturity and environmental changes.

In addition these factors are sometimes deterrents to objective discrimination with respect to essential decision. For example, the projection of personality problems into curricular choices places emphasis on the negative rather than the positive factors. On the contrary, a good curricular choice may help solve other frustrating problems whatever their nature. The counselor's responsibility is to help each student face frustrations and conflict situations rather than to permit them to direct his life. Social status should have no direct relationship with curricular selections. Instead, one of the functions of the school is to help the student face reality and to overcome any feelings of inferiority which may be associated with social status. The Scottish Survey[1] revealed some significant facts related to this problem.

Social Status

The Scottish Survey of intelligence, social status, and other factors, using a good sample of the whole Scottish population, showed that there is significantly more undeveloped talent in the lower social

[1] Social Implications of the 1947 Scottish Mental Survey. London, England, University of London Press, 1953.

classes (the classes which receive less education) *than is found* in the privileged social classes (which have every educational advantage). The evidence for this conclusion is shown in detail in Table II.

The Scottish Survey reported that, "The occupational class which contributes the largest number of the high [intelligence test] scores is not class 1 with the highest average score, but class 5, the skilled manual workers. Similarly, though the children of the unskilled manual workers have the lowest average score, yet they include 24 children [out of 416 children found in all 9 social classes] who are among the best 6.3 percent of the test. The difference between the groups is not that the upper social classes contribute more intelligent children to the total population, it is that a higher percentage of the children are intelligent." [2]

Probably the youth in the United States who constitute the poorer social groups are somewhat more likely to have the opportunity for an adequate education than in Scotland. However, the need to provide adequate educational opportunities for economically deprived groups is great. Much evidence indicates that lack of equality of educational opportunity is one of the most pressing problems in the Nation.

Table II.—Distribution of occupational class for high scoring children in the Scottish Mental Survey [1] (adapted)

Occupational class	Number in sample	High scores	(col. 3) as percentage of total high score	(col. 3) as percentage of sample
1	2	3	4	5
1	221	66	15.8	29.9
2	330	33	7.9	10.0
3	236	44	10.6	18.6
4	556	63	15.1	11.3
5	2,392	133	31.9	5.6
6	1,190	31	7.5	2.6
7	1,132	24	5.8	2.1
8	142	8	1.9	5.6
9	428	14	3.4	3.3
Total	6,627	416	99.9	6.3

[1] Special Implications of the 1947 Scottish Mental Survey. London, England, University of London Press, 1954. p. 48.

Although social status should not be a primary factor in the selection of a curriculum, it is often the determining factor even in a democratic

[2] Ibid., p. 48.

school system. The data used by the Illinois group,[3] which was originally taken from Hollingshead's *Elmtown Study*,[4] have been developed to show the relationship between I. Q. level and social class on the one hand and enrollment in various high school curriculums and social class on the other. The data summarized in Table III show that the overwhelming majority of the youth in the two lower social classes do not take the college preparatory curriculum, whereas the data in Table IV show that the two lower classes contribute a large number of high ability individuals. In fact the two lower classes contribute between four and five times as many potentially able students as the two top social classes.

Table III.—Enrollment in high school curriculums, by social class (adapted from the Illinois Study [1] and Hollingshead [2])

Course	Social class	
	I and II	IV and V
College preparation	23	27
Other curriculums	12	293

[1] Nature of School Population in the State of Illinois. Illinois Curriculum Program Bulletin No. 24. Springfield, Ill., Office of the Superintendent of Public Instruction, June 1955.
[2] Hollingshead, A. B. Elmtown's Youth. New York, John Wiley and Sons, 1949.

Table IV.—Number of individuals of varying intelligence test scores, by social class in high school (adapted from the Illinois Study [1] and Hollingshead [2])

I. Q. group	Social class	
	I and II	IV and V
111–139	23	105
70–110	12	215

[1] Nature of School Population in the State of Illinois. Illinois Curriculum Program Bulletin No. 24. Springfield, Ill., Office of the Superintendent of Public Instruction, June 1955.
[2] Hollingshead, A. B. Elmtown's Youth. New York, John Wiley and Sons, 1949.

Interests

Interest is not a characteristic which will yield a basic measurement since interests change fairly easily in relation to experience. Interests, therefore, should not be a basic factor in the selection of a curricular

[3] Nature of the School Population in the State of Illinois. Illinois Curriculum Program. Program Bulletin No. 24. Springfield, Ill., Office of the Superintendent of Public Instruction. 1955.
[4] Hollingshead, August B. Elmtown's Youth. New York, John Wiley and Sons, 1949.

sequence. Most persons can become interested only in something they can do. On the other hand, without an interest no amount of capacity will be sufficient to produce achievement. Interest follows achievement and achievement follows interest. If the curriculum is appropriate for the development of a student's intellectual traits he will normally develop sufficient interest to achieve satisfactorily in the curricular activities. Interests are rarely as stable at the eighth- to tenth-grade level as they are at the college level, where experience has broadened and the relationship between interest and successful activities is more apparent. Interest measurement is probably of most value at the secondary school level as a means of stimulating occupational exploration and evaluation of tentative choices in occupational orientation classes. When used in this manner attention is focused upon possible activities and occupations in developing an understanding of our complex industrial life. Interest inventory scores, however, should not be used at the eighth- to tenth-grade level as definite cues for the choice of curricular sequences. To use measures of immature interests in the selection of educational goals would not only be poor policy, but may prove to be a negative influence on the ultimate achievement of those goals. Hahn and McLean [5] comment that, "Many studies have shown that choice is often based upon wishful thinking, impractical aspirations, day dreaming, and a desire to give a socially acceptable answer." A good summary of the value of interests has been reported by Dressel.[6]

School Marks

School marks should be used only as supporting evidence and not as the principal criterion of curriculum sequences. Marks do not provide adequate evidence to compare strengths and weaknesses in different subjects because the standards of evaluation vary a great deal from teacher to teacher. Also, marks may be more a reflection of the personality of the student and to some extent of the teacher than of achievement. Russell and Thalman [7] state:

> Boys and girls are meeting success or failure in many of our Nation's schools on the basis of the marks which a teacher gives to them in recognition of some unknown quantity of hidden ingredients . . .

Recognize those problems for what they are, but avoid allowing them to appear in the disguise of a teacher's mark. The widespread belief that marks are assigned on the basis of academic achievement is open to serious question.

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[5] Hahn, Milton E. and McLean, Malcolm S. Counseling Psychology. New York, McGraw-Hill Book Co., 1955. P. 62.

[6] Dressel, Paul L. Interests—Stable or Unstable. *Journal of Research*, 48:95–102. October 1954.

[7] Russell, Ivan L., and Thalman W. A. Personality: Does It Influence Teachers' Marks? *Journal of Educational Research*, 48, 561–64, April 1955.

Personality Traits

Too often the personality of the student is used by principals and others in high schools to determine admittance to one or more of the high school curriculums—usually the college curriculum. In addition to personality, this decision is often supported by other factors, including social status. Educators of today believe that socialization of the individual is of considerable importance. This objective of the secondary school is accepted. However, this objective of the school should not be associated with the student's competence in any one of the various high school curriculums. Socialization and the development of other desirable personality traits are among the objectives of all curriculums. Personality measures are of highly questionable value in helping students arrive at tentative curriculum decisions. Such measures may become useful *after* the tentative choice of a high-school curriculum has been made but *not while* it is being made. The validity of the theory and practice of considering scores on personality measures as important factors in the choice of a curriculum has not been substantiated.

A Straw Man?

Some readers may feel that a straw man has been set up in the above statements regarding the use of social status, interest, and personality characteristics as an aid to counseling with students regarding choices of educational and vocational goals. The following illustration of their use in this type of counseling situation is quoted from a well-known test service publication.

> We may conclude this section with a brief outline of a sample case to illustrate the bearing of personality on vocational plans. Jerry Black was an honor senior student in a Midwestern city high school. He had obtained an I. Q. of 142 when tested at age 15 with the "Terman-McNemar Test of Mental Ability." His interests, as indicated on the "Kuder Preference Record," were as follows:
>
> | *Significantly High* | *Definitely Low* |
> |---|---|
> | Computational | Social Service |
> | Scientific | Clerical |
> | Literary | |
>
> His "Heston Personal Adjustment Inventory" results on senior boys' norms were as follows:
>
> | | |
> |---|---|
> | Analytical Thinking | 96 percentile |
> | Home Satisfaction | 70 percentile |
> | Emotional Stability | 60 percentile |
> | Sociability | 8 percentile |
> | Confidence | 12 percentile |
> | Personal Relations | 6 percentile |

Jerry's father was a successful merchant, and their closest neighbor in an excellent residential section was a noted physician, who had for some time been Jerry's ideal. Jerry came to the school counselor to plan his further education. While he had made no definite vocational choice, he had been seriously considering medicine as a career, a goal his family could easily finance and for which his mental ability seemed completely adequate. The counselor, however, read between the lines as to the probable source of the goal (the successful neighbor) and encouraged Jerry to evaluate his personality and interest scores in the light of his proposed medical goal. With a little subtle help, Jerry realized that, and considering all the pertinent evidence, his low sociability and personal relations scores on the "Heston Personal Adjustment Inventory" and the low social service on the "Kuder Preference Record" did not fit very well into the ideal pattern for a happy physician. Before the interviews were completed (it took three), Jerry decided to aim at a career in scientific research (chemistry or zoology), where direct contacts with many people would not be so important.

The problem resolves itself into whether sociability, social class, passing interests, or even marks are valid aids in choosing an educational or occupational career, or whether the original choice should be made on the basis of those factors most closely associated with the possibility of success, i. e., general intellectual level and special aptitudes. The approach to individual analysis in educational and occupational counseling which appears most valid emphasizes that these positive and basic factors should be used as the point of departure to appropriate educational and vocational choices and adjustment. Seymour's[8] observation is pertinent to this point: "The administrator needs competent guidance services for two reasons: Pupils need counsel in making choices that draw from their highest potential; and the school needs help to determine the best possible organization and program." Shaw's[9] dictum for success is also apropos here, "to be able to choose the line of greatest advantage instead of yielding in the direction of least resistance."

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[8] Seymour, Howard C. An Administrator Looks at Guidance Services. *Education*, 75: 427–28, March 1955.

[9] Shaw, Bernard. Man and Superman. New York, Brentano's, 1903. P. 134.

Section VI. The Relation of General Level of Intellectual Ability and Specific Aptitudes to the High School Curriculum and Success in Occupations

SUCCESS in the various high school curriculums, the individual courses leading into other types of education, and to some extent in recreational activities is dependent upon: (*a*) general level of intelligence, and (*b*) strengths and weaknesses in specific aptitudes.

School Curriculums

Although curricular offerings vary greatly from school to school many large secondary school systems offer four or five different types of curricular training. Sometimes two curriculums are provided for students going to college—one for those who are especially gifted, in addition to the regular college preparatory program. Sometimes separate schools for the especially gifted are established. Differentiation of some type is often made by intellectual level for those pursuing college preparatory courses and also differentiation may be made in types of college entrance prerequisites, such as foreign languages, mathematics, or science.

The general curriculum is another type. This curriculum usually offers about the same general subject areas as the college preparatory curriculum, but provides for modifications to meet variations in intellectual ability. A limited number of electives are usually available in all curriculums. The vocational and prevocational curriculum represents a fourth type. The regular vocational curriculum begins in different school systems at varying grade levels ranging from the ninth to the eleventh year. Some schools offer post-high-school vocational courses in the twelfth, thirteenth, and fourteenth years and in adult education programs. Prevocational work is often not too well defined, but usually starts in the seventh grade and runs through the ninth or tenth grades. The vocational curriculum is characterized by a variety of offerings, among the more common ones

being trade and industrial, agricultural, home economics, distributive, and business courses.

There are a number of cities that have fairly complete curricular sequences as those described above and practically all city schools offer some choice of curriculum. The size of the high school is, of course, one factor related to the number of sequences available. Small high schools are almost from necessity limited to only one sequence plus some vocational offerings; but even here the recognition of the differences in intellectual level and special aptitudes can be used if individualization of instruction is practiced. Among schools reporting curricular sequences similar to those mentioned above are Madison, Wis., and Pittsburgh, Pa. In the largest city school systems, such as in New York City, the various curricular sequences are provided for, in part, by establishing separate schools for particular sequences, or even for variations within sequences. Thus, New York City has specialized vocational or trade schools and specialized high schools for college-bound students especially able in science.

Examples of some of the relationships between four curriculums and the general mental ability level and special aptitudes are shown in Chart IV. No attempt has been made to describe all of the possible variations in each curriculum for the varying special aptitudes and the suggested overlap of general intellectual level scores should be noted. An illustration of students who have special aptitude in quantitative and mechanical ability at the various levels is given later in this bulletin. *It is important to* recognize that the selection of curriculums and the choice of occupations is an integrated process, using the same original guidance data. That is, selection for training purposes, difficulty of the occupation, and levels of ability would be given the same consideration in occupational choice as the difficulty of subject matter and abilities of the student are given in curricular choice.

Vocational guidance must be directed toward the processes involving, (*a*) occupational choice and preparation, and (*b*) occupational placement, growth, and adjustment. The first of these is initially centered primarily in the school, while the second starts in the school and continues throughout the occupational life of the individual. Within this context tentative occupational choices should be a major consideration in the interpretation of educational potentialities, and curriculum choices made, through guidance, at the eighth-, ninth-, and tenth-grade levels. The educational potential of the individual and the corresponding occupational choice thus serve as the criteria for planning appropriate preparation in high school, college, and graduate school. Occupational placement following formal preparation in school opens new avenues for continued oc-

Chart IV.—Relationships of general intellectual level, special aptitudes, and high school curriculum

General intellectual level (I. Q.)	Achievement measures at the 7th Grade			
	Language usage—reading vocabulary		Arithmetic—computation reasoning	
	Multipotential measures at the 9th grade			
	Verbal	Quantitative	Mechanical comprehension	Spatial reasoning
108-up....	College-preparatory curriculum with variations for the development of special aptitudes.			
100–120...	General curriculum except for areas in which the student is especially capable—in those areas the subjects in the college-preparatory or vocational curriculum would be taken. This would prepare for semiprofessional and technological education.			
90–110.....	Combines vocational and general curriculum. This would prepare for entrance into apprentice training or directly into skilled trades.			
70–90.....	General curriculum. In large schools, this might be at a lower level than the regular general curriculum. This level prepares for direct entrance into those occupations requiring a short training period on the job.			

cupational preparation, and expanding occupational opportunities. In true American tradition learning on the job becomes an essential part of occupational preparation for a vast array of jobs which lie above the level of the entrance job. With the exception of unskilled jobs, this process applies, in varying degrees, to all occupational levels from the semiskilled jobs through the professions. The basic ideas of growth within occupational areas and levels are illustrated at two different occupational levels in Chart V.

There are, of course, many factors which operate to create occupational opportunities which are independent of individual control, for example (*a*) the differentiated growth of industry and the resulting changes in occupational activities; or (*b*) the opportunities within the particular industrial organization in which the individual is employed. The progression within an occupational field otherwise de-

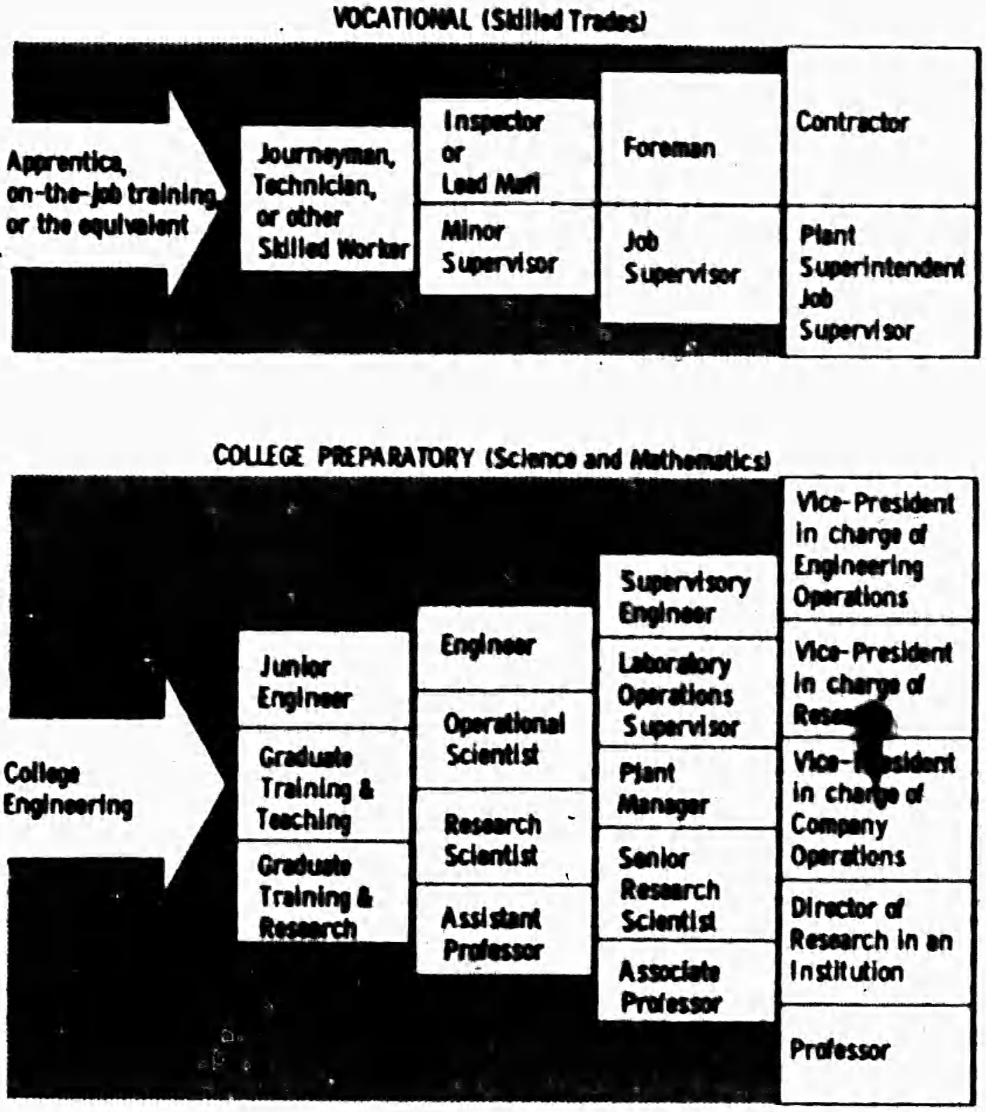

Chart V

pends largely upon the original intellectual level, the differentiated aptitudes, the development of these aptitudes, and the various other personal qualities of the individual worker.

One concept becomes increasingly significant as a result of an analysis of Chart V. The original prognosis for the student when the tentative occupation and curricular sequence are chosen should be based on sound factual data indicative of special aptitudes and general mental ability. These are the basic and indispensable factors that make the completion of education and training possible and enable the youth to enter appropriate employment. Growth and adjustment in school and particularly in the occupational world are greatly influenced by other factors after the basic decisions are reached. The progress of the young employee in his chosen occupation is dependent upon personal traits which are essential to the full

utilization of special aptitudes and mental ability. It is entirely possible for a youth to have the necessary special aptitudes and mental ability to reach the top of his occupational area and yet remain in the lower levels of the area. It is at this point that such qualities as personality, social status, initiative, resourcefulness and willingness to work become preeminently important. Counselors and teachers should assist the student in identifying and modifying personal qualities so that they may contribute to the achievement of educational goals. At the original level of guidance and counseling for the selection of an occupation and a curricular sequence these factors were given a neutral position, but in the process of educational preparation and occupational progress, their relative positive and negative influences must be determined. From this evaluation plans should be formulated for the avoidance, utilization, and modification of these traits as they may relate to the more basic objectives of optimum development of the individual's intellectual potential and special aptitudes.

Let us examine some examples of this process in relation to different intellectual levels and special aptitudes. Students with a high intellectual level and especially high levels of mechanical comprehension and quantitative ability may pursue training in the various scientific and engineering fields, and after college graduation become high school mathematics or science teachers. With graduate training, the lower ranks of college and university teaching are opened up with opportunities to work up gradually to the level of research scientist. Those with this ability and aptitude pattern who graduate in engineering may enter the profession as a junior engineer and progress to the positions of senior engineer, supervising engineer, and eventually management of an engineering firm.

Students within the average range of general intellectual ability with special ability in mechanical comprehension, and with average or above average spatial and quantitative abilities, may enter either the general curriculum or a vocational curriculum in high school. After high school graduation apprenticeships or advanced technical training at the thirteenth- or fourteenth-grade levels are good possibilities for more nearly adequate development of the student's potential. A 2-year post-high-school technical course will open up many opportunities for employment at the technical level. The apprenticeship route offers opportunity for progression from the semiskilled level to the skilled level and possibly to the technical level occupations. A large majority of the technical level occupations are filled by upgrading people on the job either informally or through organized job training programs. A few attain the professional level by further development on the job and larger numbers are utilized

in supervisory positions at the technical level. This upgrading of occupational level almost always occurs in the same general type of work at progressively higher levels. Progression to these higher occupational levels usually requires an above-average level of ability, both in terms of general intellectual level and in special abilities or traits.

For long-term occupational progression the original consideration of intellectual ability and special aptitudes becomes increasingly important. The rate and extent of occupational progression depend largely upon general intellectual level, and the original occupational direction depends upon both intellectual level and special traits or abilities. It must be remembered, however, that progression is not only a function of traits and level, but also of the influence of the other personal and environmental factors.

The ideal school will see that these other factors are carefully evaluated, developed, and modified to enable optimum and balanced total development of the student. In adult life the individual must assume the primary responsibility for the appropriate utilization of his aptitudes. These other personal characteristics will inevitably govern, to some degree, the advancement in the various levels of the chosen occupational area. The school has the responsibility with the less mature members of society to see that their potentialities are identified and developed and that personalities are developed to permit full utilization of their abilities in adult life.

Relation of Theories of Occupational Choice to the Approach Developed

The process of occupational choice and the determinants of career patterns are related significantly to the thesis of this bulletin. That is, occupational choices should be more realistically reached than is evident in many cases. This approach has attempted to present suggestions for the consideration of basic facts significant to realistic choices. Super and Hoppock [1] [2] have made some of the most extensive analyses of the theories of vocational choice. Super and some of his colleagues are engaged in a longitudinal study of a group of individuals extending from about the age of 12 to final occupational adjustment in adult life. There are some aspects of this analysis and research that have an important bearing on the approach presented here. The research in the theory of occupational choice is designed

[1] Super, Donald E., *et al.* Vocational Development: A Framework for Research. New York, Bureau of Publications, Teachers College, 1957.

——— The Psychology of Careers. New York, Harper and Bros., 1957.

[2] Hoppock, Robert. Occupational Information. New York, McGraw-Hill Book Co., Inc., 1957.

to discover how people acquire their adult vocations. It has been discovered that there are many factors related to this process, such as social status, family, attitudes, interests, personality, geographical factors, and aptitudes. These studies are factual—they point out the factors that do operate, but they are not evaluative. They do not indicate whether the final choices were advantageous to the individual or to society. If, however, some agreement can be reached regarding those factors which will produce the best individual adjustment and also best serve the needs of society, then the study of vocational choice will make significant contributions. If there is any agreement on the relative values of the positive factors in educational and vocational choice, as developed in this bulletin, then the utilization of research results from studies of occupational choice will add substantially to the total analysis of the problem.

Section VII. Specific Guidance Procedures

THE PRECEDING DISCUSSION has been devoted to basic considerations of intellectual abilities and aptitudes without specific reference to applied interpretations in guidance procedures. In order to provide students with appropriate assistance in curriculum selection it is desirable that the measurement program for this purpose begin not later than the seventh grade. This part of the program should be followed by measurement for the vocational selection process in the ninth or tenth grades. In the seventh grade, an achievement test battery and a general intelligence test are basic; in the eighth grade, the intelligence tests should be repeated; and, in the ninth grade a multipotential test should be given. Although this program is frequently confined to the ninth-grade level, the program outlined above is superior for three reasons: First, the reliability of the diagnosis and prognosis is increased by the number of measurements; second, the use made of measurements in the seventh, eighth, and ninth grades gives the counselor a chance to identify changes in development (substantial deviation from growth trends would occur in only a few cases), and also to show the growth pattern of the individual insofar as this can be done in 3 years; and, third, the traits and abilities revealed by the achievement test battery used in the seventh grade and the aptitude test battery used in the ninth grade may be sufficiently different to justify further study and to suggest modifications in individual educational and occupational programs.

The results on the (1) achievement test battery, (2) the general intelligence test, and (3) the aptitude test battery should be analyzed to identify discrepancies which might be attributed to standardization on somewhat different populations. The discrepancies, however, will not be sufficient to invalidate the findings. Ideally, it would be better if all three instruments used could be standardized on the same population and all scores translated into the same medium, that is, some type of score based on the standard deviation of the distribution of scores on each test.

Seventh-Grade Achievement Test Battery

The results of achievement tests at the seventh-grade level can serve teachers, principals, and counselors for a variety of instructional and immediate guidance purposes. This discussion is limited to their use in making curricular choices at the high school level. Test results indicative of the general level of achievement, as well as areas of strengths and weaknesses in achievement, can be most helpful in discussing educational plans with both parents and students.

Examples of achievement tests which may be used for this purpose are:

American School Achievement Tests: Advance Battery. For grades 7–9. Sub-tests on (1) Sentence and Word Meaning, (2) Paragraph Meaning, (3) Arithmetic Computation, (4) Arithmetic Problems, (5) Language, and (6) Spelling. Public School Publishing Co.

California Achievement Tests: Intermediate Battery, Grades 7–9. Sub-tests on (1) Reading, (2) Vocabulary, (3) Reading Comprehension, (4) Arithmetic Reasoning, (5) Arithmetic Fundamentals, (6) Mechanics of English and Grammar, and (7) Spelling. California Test Bureau.

Coordinated Scales of Attainment. Elementary Division Battery. For grades 4–8. Subtests on (1) Language Arts (includes reading and spelling), (2) Social Studies, (3) Arithmetic Skills, (4) Literature and Science. Educational Test Bureau.

Gray-Votaw-Rogers General Achievement Tests: Advanced. For grades 7–9. Sub-tests on (1) Science, (2) Language, (3) Literature, (4) Spelling, (5) Vocabulary, (6) Reading Comprehension, (7) Social Studies, (8) Health and Safety, (9) Arithmetic Reasoning, and (10) Arithmetic Computation. Steck and Co.

Iowa Tests of Basic Skills: Grades 3–9. Sub-tests on (1) Vocabulary; (2) Reading Comprehension; (3) Language Skills (Spelling, Capitalization, Punctuation, Usage); (4) Work-Study Skills (Map Reading, Reading Graphs and Tables, Knowledge and Use of Reference Materials); and (5) Arithmetic Skills (Arithmetic Concepts, Arithmetic Problem Solving). Houghton Mifflin Co.

Municipal Battery Tests: New Advanced. For grades 7–9. Sub-tests on (1) Language Arts (includes vocabulary, word usage, spelling, sentence structure, reading comprehension, and literacy appreciation); (2) Mathematics, and (3) Social Studies (including health education and science). Acorn Publishing Co.

Sequential Tests of Educational Progress: Level 3 for grades 7–9. Sub-tests on (1) Language Skills, (2) Science, (3) Mathematics, and (4) Social Studies. Educational Testing Service.

SRA Achievement Series: Battery for grades 6–9. Sub-tests on (1) Language Arts, (2) Reading, (3) Arithmetic, and (4) Work Study Skills. Science Research Associates.

Stanford Achievement Test: Advanced Battery. For grades 7–9. Sub-tests on (1) Paragraph Meaning, (2) Word Meaning, (3) Social Studies, (4) Science, (5) Language, (6) Arithmetic Reasoning, (7) Arithmetic Computation, (8) Spelling, and (9) Study Skills. World Book Co.

Normally, even a tentative prognosis of the most desirable high-school curriculum is seldom made at the seventh-grade level. When questions about curriculum are raised by the student or his parents, however, it is helpful to have information available to make a tentative prognosis. Also, experience has shown that a general and tentative diagnosis and prognosis may be made with considerable accuracy at this level—but it must be regarded at tentative.

Intelligence Level

A general intelligence test should be given during the seventh grade and again in the eighth grade to establish more firmly the general level of intelligence. The results of these tests and the variability in the different achievement areas, shown by the achievement test administered to the student in the seventh grade, justify preliminary and tentative guidance decisions regarding curricular choices.

Examples of some intelligence tests appropriate for this level are:

California Test of Mental Maturity: Intermediate Series, for grades 7–9. California Test Bureau.

Detroit Intelligence Tests: Alpha Test for grades 4–8. Public School Publishing Co.

Henmon-Nelson Tests of Mental Ability: For grades 7–12 and college. Houghton Mifflin Co.

Kuhlmann-Anderson Intelligence Tests: Sixth Edition, One Booklet for grades 7–8. Personnel Press, Inc.

Kuhlmann–Finch Intelligence Tests: Junior High School Test. Educational Test Bureau.

Otis Quick Scoring Mental Ability Tests: Beta Test, for grades 4–9. World Book Co.

School and College Abilities Tests: Level 3, for grades 7–9. Educational Testing Service.

Terman-McNemar Test of Mental Ability: For grades 7–12. World Book Co.

Multi-Potential Approach at the Ninth-Grade Level

At the ninth-grade level a multiple aptitude type of test should be given from which a more complete analysis of multi-potential traits can be made. Examples of some of these tests are:

Differential Aptitude Tests: For grades 8–12. Sub-tests on (1) Verbal Reasoning, (2) Numerical Ability, (3) Abstract Reasoning, (4) Space Relations, (5) Mechanical Reasoning, (6) Clerical Speed and Accuracy, (7) Language Usage. The Psychological Corporation.

Guilford-Zimmerman Aptitude Survey: For grades 9–12, college and adults. Sub-tests on (1) Verbal Comprehension, (2) General Reasoning, (3) Numerical Operations, (4) Perceptual Speed, (5) Spatial Orientation, (6) Spatial Visualization, and (7) Mechanical Knowledge. Sheridan Supply Co.

Holzinger-Crowder Uni-Factor Tests: For grades 7–12. Sub-tests covering the following abilities: (1) Verbal, (2) Spatial, (3) Numerical, and (4) Reasoning. World Book Co.

Multiple Aptitude Tests: For grades 7–13. Sub-tests on (1) Word Meaning, (2) Paragraph Meaning, (3) Language Usage, (4) Routine Clerical Facility, (5) Arithmetic Reasoning, (6) Arithmetic Computation, (7) Applied Science and Mechanics, (8) Spatial Relations—Two Dimensions, and (9) Spatial Relations—Three Dimensions. California Test Bureau.

SRA Primary Mental Abilities: For ages 11–17. Sub-tests cover (1) Verbal Meaning, (2) Space, (3) Reasoning, (4) Number, and (5) Word-fluency. Science Research Associates.

Application of the Intellectual Level and Specific Aptitude Scores in the Curriculum Grid

The problem of selection (guidance) of students for vocational education is first of all a problem of general educational guidance. The counselor and teacher are obligated to provide the student with all possible assistance in making educational decisions. The basis for these decisions should be a careful analysis of general intellectual ability and level and variation of specific aptitudes. When these decisions are made on any other basis, the guidance provided the student tends to become unsystematic and vitiated by subjective opinions, counselor bias, and unwarranted attention to secondary personal characteristics.

One of the most recent reviews of the literature on predicting success in high-school trade and industrial courses was reported by Patterson.[1] His conclusions, based on an analysis of the evidence on the relation of various factors to success in these courses, were: (1) Tests of verbal ability or general intelligence have been found to be significantly related to (success) in trade school courses; (2) tests of visualization (or spatial relations) have shown significant relationship with success in trade-school courses; (3) tests of mechanical experience and comprehension are predictive of success in trade-school courses; (4) tests of simple manual ability or dexterity do not appear to be related to success in trade-school courses.

Since it has been established that students planning to enter technical courses and vocational courses should be guided by evidence of substantial proficiency in quantitative and mechanical comprehension, our illustration will be concerned with students possessing those strengths. Actually, of course, some aspects of both general ability level and special aptitudes have to be considered if the general intellectual level indicates a vocational curriculum as desirable for the student, and should serve as a cue for serious consideration of this alter-

[1] Patterson, C. H. Predicting Success in Trade and Vocational School Courses: Review of the Literature. *Educational and Psychological Measurement*, 10: 363–369, Autumn 1950.

native by both the counselor and the student. The student must make the final decision; however, this decision should be made only through good counseling of sufficient duration to insure appropriate understanding of the educational and vocational direction which seems to hold the greatest probability of success.

Students at the first or highest general level of intellectual ability, with substantially above average quantitative and mechanical comprehension abilities, and with average or above verbal and spatial abilities should consider the regular college preparatory curriculum with emphasis in science and/or mathematics. This course of action would lead to the probability that college planning would emphasize some phase of science, mathematics, or engineering. In the case of students at the second level of general intellectual ability with special abilities in the quantitative and mechanical comprehension areas and with average competence in the spatial area, the general high school curriculum with regular college preparatory subjects in mathematics and science is indicated. This might very well lead into the 2-year technical curriculum in a junior college or technical institute. If the general intellectual level indicates the trade or vocational level and if the student is average or above in mechanical comprehension and not greatly below average in quantitative and spatial abilities, the student may profitably consider the vocational curriculum in high school—which, of course, may extend into training at the trade school level. Some general basic courses in high school should precede and parallel specific vocational training.

For students at the fourth general intellectual ability level, with near-average scores in mechanical comprehension, plans for the general curriculum of a high school and direct entrance into operative occupations or other simple mechanical work are usually indicated.

Chart VI shows the relationship of special potentiality in quantitative aptitude and/or mechanical comprehension at different general levels of intellectual ability to the different curriculum alternatives.

One important point in regard to the intellectual level of vocational education students should be emphasized. At present, the general intellectual ability of students enrolled in vocational courses in many schools is skewed significantly towards the lower end, and they seldom represent a substantial total range of ability.

In New York City, the average I. Q. of entering vocational education students was only 85.7 in 1953. They reported [2] that:

> With the chronological promotional policy now in effect in the lower schools, some students now reach secondary schools with the intelligence levels formerly considered not sufficient to do adequate elementary school work. The average I. Q. of students entering the vocational high schools

[2] Guidance in Vocational High Schools. Curriculum Bulletin 1954–55, Series No. 2. New York, Board of Education of the City of New York, 1955.

in 1953 was 85.7. It is a serious question whether it is possible to make skilled workers out of individuals with intelligence scores lower than this average, yet one-half of the entering pupils are in this group. If the demands made on the student by the shop or classroom teacher are too great for his comprehension, he is likely to rebel in some fashion. This may take the form of refusal to work, absence from school, or conduct that will distract attention from his inadequacy. When pupils are grouped according to their abilities, [illegible] are not made conspicuous by their inferior performance. They enjoy competition with their equals if the tasks are not beyond them. Teachers in the vocational high schools long ago learned to modify the subject matter to keep within the abilities of the pupils, but they often fail to recognise that the difficulties of a troublesome pupil may be traced to his inability to understand the work of the class even at the lower level. Most vocational high schools make provisions for such pupils by means of low-ability tracks in both the academic and shop subjects. The guidance counselor is concerned with the organisation of the special courses and the assignment of the proper pupils to them.

Chart VI.—Examples of the relation of general intellectual level and the special aptitudes to the choice of curriculums in high school and education or vocational plans beyond the high school

I. Q.	Special aptitudes			
	Verbal	Quantitative	Mechanical comprehension	Spatial
1	2	3	4	5
108–up....	(*)	(**)	(**)	(**)
	College preparatory curriculum with science emphasis—leading to engineering in college.			
100–120...	(**)	(**)	(*)	
	General curriculum with regular college preparatory science courses—leading to 2-year technological junior college.			
90–110....	(*)	(**)	(*)	
	Vocational curriculum in mechanics for entrance into the trades at the mechanic helper stage.			
70–90.....	(*)			
	General curriculum—entrance into power machine operation or other simple mechanical work.			

*Average or slightly above.
**Substantially above average.

Educators are greatly concerned with the problem of assigning students to vocational courses in high school. Students who are poor in academic subjects are often assigned to vocational courses. This

is often due to the lack of school facilities and the failure of some educators to understand that inadequate ability to master traditional academic subjects is no indication of aptitude for learning a skilled trade. The quotation from the Report by the New York Board of Education says: "With the chronological promotion policy now in effect in the lower schools, some students now reach secondary school with the intelligence levels formerly considered not sufficient to do adequate elementary school work." The fragmentary data available indicate that this may be a general situation throughout the United States. The fact, however, that it exists in New York City is alarming. If such poor students are to be assigned to lower levels of work it should be in a more appropriate program than vocational education for the skilled trades. Educators throughout the Nation are now discussing the inadequacy of the secondary school program. Particular attention is being given to students on the two extremes of intellectual ability, namely, the gifted and the below average. In far too many instances the below average student has been assigned to vocational courses. Overwhelming evidence indicates that this plan is not satisfactory and may do immeasurable harm to both the student and the vocational program. The need for sound guidance is clearly indicated, but cannot function with respect to this problem until school administrators recognize and take positive action in developing a feasible program for these students. Only students who can profit from technical and trade instruction should be assigned to vocational trade and industrial education classes. The program has been in operation 40 years, yet this problem of selecting students for trade courses has scarcely been touched.

This discussion has been focused upon students with potentialities in the scientific areas and in trade and industrial education. The basic principles of this approach are just as applicable to the other professional and vocational areas, such as law, the humanities, accounting, business education, and distributive education. It is hoped that the examples presented have been sufficiently illustrative of the basic principles involved, that teachers in all fields and counselors of all students will be able to use the approach regardless of the area of greatest student potentiality. The most significant practical limitation on the application of this approach to any educational or vocational pursuit is the restriction on modification of curricular emphases in the school. If curricular choices and modifications are not possible, little educational planning can be accomplished and educational opportunities are proportionately limited.

Section VIII. Concluding Statement

THE APPROACH presented here is related to only one specific aspect of guidance procedure, which either has not been recognized or has not been spelled out in theory or practice. It has been suggested here that school counselors separate student data into two categories for two different uses. It is suggested that in order to do this successfully, the two different uses be separated in point of time when they are first used in the educational and vocational guidance of a student.

It is emphasized that there are two types of data—positive and negative—which should be used in a sequence in the original counseling with the student about his educational choices at the beginning of the high school period. At later grades as choices are evaluated, it is proper to consider all factors in combination since it is assumed that the maintenance of original choice may be dependent on modification of factors with negative influence.

This approach to the problem of curriculum or occupational choice is not contrary to Super's "theory of vocational choice." Rather it suggests that there are points at which vocational choices can be improved over prevailing patterns. It is hypothesized that the current studies of vocational choice will find that prevailing patterns of choice are often inimical to the problem of manpower of the Nation on the one side and the adjustment of the individual to his career on the other.

When counseling with a student about strictly personal and social adjustment problems, *all* of the information about a student should be considered. This discussion has no direct bearing on the procedures in personal and social guidance, except that indirectly the solution of educational and vocational problems may enhance personal adjustment.

Appendix I. Two Minor Limiting Features

ALTHOUGH the procedures outlined in this publication deal with the problem of educational and vocational guidance for the majority of high school students, there are two limitations which should be noted. First, specific provision has not been made for students with a high level of artistic or music aptitude. The reason these aptitudes were not considered in the overall outline is because only a small minority of the students will display significant potentialities in these areas, and it is not practical to give art and music aptitude measures to all students. The guidance of individual students in these areas should be based on a consideration of the student's motivation as well as his talent. In our society, occupational opportunities in art and music are not great and the educational program for development appropriate to these occupations has not been clearly established. However, where such talents are suspected, or student aspirations are in these areas, the counselor should administer special aptitude measures in art or music on an individual basis.[1]

The interpretation of aptitude scores in music or art should follow the same approach as presented in previous sections. The general level of intellectual ability and the level of the special aptitudes would serve to estimate the type of high school curriculum most appropriate for the student.

The second limitation is that this method assumes approximate equality of school experiences—that is, the students involved are assumed to have had their school experiences in the United States and to have entered school at about the 5 to 7 year age level and to have attended continuously without significant interruption, such as being out of school for a year or more. Retardation or acceleration of a year or two does not invalidate this approach because the interpretation of test results at the seventh and eighth grade can be made using age and grade norms. Special aptitude or trait scores are related to the grade group. This is not a disturbing factor, however, since the scores on special aptitude tests tend not to vary a great deal from grade-to-grade at this level.

[1] The names of companies publishing aptitude tests in music and art may be obtained from the *Measurement Index* (U. S. Office of Education Circular No. 608, January 1960).

Appendix II. Note on Cummulative Records for Use With the Essential Data Discussed in This Approach

THE CUMULATIVE RECORD for the junior and senior high school period should carry an understandable record of the achievement battery at the seventh grade, the general intelligence test results at the seventh and eighth grade, and the multi-potential aptitude tests at the ninth grade. Most cumulative records have provision for recording scores. However, they are not always shown so that the comparison can be easily made among the scores. For this reason, it is suggested that provision be made for the achievement battery test scores at the seventh grade to be geared to age and grade norms, and for the multi-potential aptitude test scores at the ninth grade to be given in percentiles or sigma scores for the grade. Provision for general mental ability test scores, i. e., M. A.'s and I. Q.'s are found in practically all cumulative records.

Appendix III. Addresses of Publishers of Measurements Mentioned in This Approach

ACORN PUBLISHING CO., Rockville Centre, N. Y.

*BUREAU OF EDUCATIONAL MEASUREMENTS, Kansas State Teachers College, Emporia, Kans.

*BUREAU OF EDUCATIONAL RESEARCH AND SERVICE, State University of Iowa, Iowa City, Iowa.

CALIFORNIA TEST BUREAU,
5916 Hollywood Boulevard, Los Angeles 28, Calif.
208 Bridge Street, New Cumberland, Pa.
2114 Irving Boulevard, Dallas 7, Tex.
110 South Dickinson Street, Madison 3, Wis.

EDUCATIONAL TEST BUREAU,
720 Washington Avenue, SE., Minneapolis 14, Minn.
3432 Walnut Street, Philadelphia 4, Pa.
2106 Pierce Avenue, Nashville 5, Tenn.

EDUCATIONAL TESTING SERVICE,
20 Nassau Street, Princeton, N. J.
4640 Hollywood Boulevard, Los Angeles 27, Calif.

*C. A. GREGORY CO., 345 Calhoun Street, Cincinnati 19, Ohio.

HOUGHTON MIFFLIN CO.,
2 Park Street, Boston 7, Mass.
432 Fourth Avenue, New York 16, N. Y.

*These companies distribute some of the tests of other companies, but do not publish any of the tests mentioned in this publication themselves.

PERSONNEL PRESS, INC., 180 Nassau Street, Princeton, N. J.

THE PSYCHOLOGICAL CORPORATION, 304 East 45th Street, New York 17, N. Y.

†PUBLIC SCHOOL PUBLISHING CO., 345 Calhoun Street, Cincinnati 19, Ohio.

SCIENCE RESEARCH ASSOCIATES, 57 West Grand Avenue, Chicago 10, Ill.

SHERIDAN SUPPLY CO., Box 837, Beverly Hills, Calif.

THE STECK CO., Ninth and Favaca Street, Austin, Tex.

*WESTERN PSYCHOLOGICAL SERVICES, 10655 South Monica Boulevard, Los Angeles 25, Calif.

WORLD BOOK CO.,
441 West Peachtree Street, NE., Atlanta 8, Ga.
2126 Prairie Avenue, Chicago 16, Ill.
6 Beacon Street, Boston 8, Mass.
Yonkers-on-Hudson 5, N. Y.
707 Browder Street, Dallas 1, Tex.
2054 University Avenue, Berkeley 4, Calif.

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*These companies distribute some of the tests of other companies, but do not publish any of the tests mentioned in this publication themselves.

† This company is merging with the C. A. Gregory Co. of Cincinnati.