



1-1-1939

# The Effect of Music on Mental Deficiency

Russell E. Goucher

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THE EFFECT OF MUSIC ON MENTAL DEFICIENCY

PREFACE

This volume is a result of an effort to determine  
the effect of music on the mental development of  
mentally deficient children.

BY  
RUSSELL E. GOUCHER

Dr. Charles A. Munn, Superintendent of Schools,  
Chicago, Illinois, has formulated modern theories and  
methods for the educational growth of the  
mentally deficient child. These theories and methods have  
inspired the writer and have led him to make this

Psychologists believe that the main cause of  
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A Syllabus Submitted in Partial Fulfillment  
of the Requirements for the Degree of  
Masters of Music in School Music

The writer wishes to thank Mr. Stanley Burris, our  
critic, for his valuable aid and personal  
interest, and Mr. Walter Valley, Principal, for his  
kindness.

R. E. Goucher

THE ARTHUR JORDAN CONSERVATORY OF MUSIC

1939

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ARTHUR JORDAN  
CONSERVATORY OF MUSIC

## PREFACE

This syllabus is a result of an effort to discover how music effects the mentally deficient.

Mr. Donald Du Shane, Superintendent of Schools, Columbus, Indiana, has formulated modern theories and methods of caring for the educational growth of the handicapped child. These theories and methods have interested the writer and have led him to make this research.

Psychologists believe that the main cause of many mental cases is due to the unbalanced conditions of the emotions. By giving the child music in the public schools we are not only treating him for his mental disorder but we are giving him a balanced emotional experience which may lay the foundation toward a habit of learning.

The author has made tests, demonstrations, and experiments at the Central High School, Columbus, Indiana. He wishes to thank Mr. Stanley Norris for his constructive criticisms, invaluable aids and personal interest and Mr. Harley Talley, Principal, for his kindly counsel.

R. E. G.

Columbus, Indiana

June, 1939

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## Chapter I

Linking Music With Other Subjects  
In The Curriculum

In this research we are concerning ourselves with the problem of the validity of tests. What is accomplished in measuring ones intelligence and how does this effect his study of music? Is there a connection between music and the other subjects in his curriculum? If there is a connection and tests are of great value to us then we are justified in saying that a child can study music because he has a high "I. Q." But then what of the many children with a low "I. Q.?" Couldn't music be of benefit to them? Perhaps in many cases music may be the very study that they need to help them in their particular mental disease.

Today, more than ever we are interested in the placement of the child in the field to which he is most suited, both mentally and physically. The schools of today make a careful study of each child as to his mental capacity and physical build and try to make up his curriculum with the subjects that are suited to his ability and subjects which will not only help him at present, but which will have a direct influence on his future vocation. And again, a vocation for which he is most suited.

Ever since Binet used his famous examination for the recruiting of soldiers to determine the way each man would act in most situations, and thus showing their probable worth

as a soldier, testing has become more and more popular. Many new and different tests have appeared. Psychologists everywhere have made new mental tests--each one concerning itself with a different problem. Today we are not concerned with the making of new tests, but with the trying out of those already devised.

What is "intelligence"? John Frederick Dashiell, professor of Psychology at the University of North Carolina says:<sup>1</sup>

"First, let us not be misled by the form of the work: It is not a thing, not a substance, not a quantity of something. Like the chemist's word "valence" it refers to a capacity that something may exhibit in greater or lesser degree. As frequently employed, also, it refers to a quality or characteristic of a person's (or animal's) behavior. The present writer would recommend less use of the word "intelligence" and more use of modifiers such as "intelligent behavior," "intelligently," and so forth. It is an interesting fact that, although psychologists seem to be in fair agreement as to when it is proper to use the term and when not, they must confess failure in their attempts to define it accurately. Tentative statements to be found in the literature on this subject are such as these: Intelligence is the "capacity for persistent effort in pursuit of a goal," "capacity for adjusting thinking to new requirements: general adaptability to new problems and conditions of life," and so on, until we find one psychologist contenting himself with the statement that "intelligence is that which intelligence tests measure." Now there is an historical justification for this last; for interest in human "intelligence" has arisen and has increased hand in hand with the development of testing methods.

That the methods of examination get at some capacity or capacities has been abundantly shown, even if what they get at remains in doubt. The capacity can be isolated in fact if not in words.

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1. Dashiell, John Frederick--Fundamentals of Objective Psychology Chapter 11--pp. 304-324

And in any case, there is some point to the claim that "measurements should precede definition."

The term is, however, not new to psychology. To be sure, technically it has formerly not occupied a place of importance in human psychology, but in the study of animal behavior it has been a central topic. Darwin, Romanes, and others had studied the apparently intelligent conduct of animals as manifested in a few of their own observations,.....Now the main contention of these experimentalists was that an animal that was intelligent was an animal that could adapt itself to new conditions, could learn; and the question as to how intelligently a given dog or turtle acted turned out to be a question of how readily and effectively it could pick up new habits.

It can be maintained that the use of the term "intelligence" by later-day examiners of human beings means nothing after all essentially different from what the workers with animals meant by the same term; and we will not go far astray from its general meaning if we adopt the statement that it is "the capacity to acquire and perfect new modes of adaptation through individual experience." It has been called "educable capacity."....On the higher human levels Stern's definition of intelligence is valid: "the general capacity to adjust thinking to new requirements." A person or animal that learns rapidly or elaborately, then, is intelligent.

This is not to be confused with the popular way of calling that man intelligent who is well equipped with "knowledge." It is more the capacity to get knowledge (and other habits). What makes a person intelligent is not what he knows or can do but is his capacity easily and quickly to acquire that knowledge or ability to do."

It would seem then that intelligence is determined not by what we have learned but by our ability to acquire habits. Intelligence is not made up of practices and experiences but is something that is inborn. The more intelligent child, or the child with the higher I. Q. is able to ac-

quire more rapidly and effectively than the child with a low I. Q.--providing, of course, that they are both given the same environmental opportunity and the same habits.

But what has this to do with music? Does the study of music require intelligence? A good musician is gifted at birth with a certain amount of ability and talent, but whether or not this is developed is up to the individual. If this ability is developed it would certainly require a certain amount of intelligence, and intelligence and music are both inborn, therefore there must be some connection between music and intelligence.

A persons intelligence is determined by his ability to acquire habits. The study of music is a matter of habit or habits. Music has grown slowly but surely from an extra-curricular activity into a definite part of the school's curriculum. However there are still educators who believe that music is inferior to other subjects. They feel that it is still the traditional three R's--Reading, 'Riting, and 'Rithmetic.--Why not add a fourth--Rhythm? Do they not stop to think that music carries over to other subjects and also helps in the making up of ones personality? Music contributes very definitely to the four-fold life of the child as well as the seven cardinal principles. In fact, it is probably the only subject in the whole curricula which does contribute to all seven of the principles.



All educators believe that education contributes to the fullness of life. Is not the relationship between music and life an intimate one? Since it stimulates all of the subjects in the curriculum, and has the practical value of the three R's and has a definite contribution to make in developing the fourfold life of the child and seven cardinal principles of education, they would surely agree that music runs hand in hand with academic subjects. Music has come to be regarded as an important factor in the achievement of the fundamental goals of education. This development is a tribute, both to the necessary force of music as a refined experience and to the great far-seeing educational philosophy which found a more permanent place for music in the school curriculum.

The Aims of Education, no matter how expressed, point to a person who is fully prepared to command a life economically secure and spiritually rich because he has been equipped with those elements of knowledge and skills that will give to him "the abundant life." The question is how to bring these aims into a workable educational program in order to bring forth the desired result. From birth to maturity great care is taken to provide the child with the proper experiences that will mold his education and nature into an individual with integrity. With his entrance into school the curriculum is so designed that he will be given the correct facility in his various studies essential for

his natural growth and development. The seeds of knowledge are planted and tended while he is young so that in future years when harvested this will not be a handicap to civilization. The importance of language as a necessary "must" in education is stressed. A sound physical body is perfected through Physical Education classes. Attention is given to the fundamental knowledge of numbers and their relations. And last but not least his religious training and his morals are emphasized not only in the school room, but also at home. But what of the development of good tastes and an equally well-balanced experience in the realm of aesthetics? Are not the subjects of art and music as important as these other experiences in contributing to "the abundant life?" Is there not a connection?

From the early ages to the present, man has used music as a means of relieving his mind and soul of the troublesome conditions about him. He has found use for it in war, revelry, labor, worship and many other varied activities. Music is just as important in time of war as the most powerful agents of destruction the militants might have, especially its value in maintaining a high military morale.

We find examples of music being used to lessen the strain of labor almost all over the world. For instance the sailor's chantey is used when hauling in the anchor, then too, in the south we find the negro singing when loading cotton. From Russia we have obtained the Volga

boatmen's melodies; of late, modern industry is learning that the singing of a peppy tune will speed up slow fingers and help to a certain extent to ease aching muscles.

Music and religious worship has always had a close association. Just how much music contributes to sanctity is hard to determine, but a worship service without music would be indeed a failure. Does not emotion enter into a religious service? Does not music arouse our emotions? The combination of these two bring about a feeling of oneness to the Almighty Power. It is possible that music aids more in the establishing of this feeling than the service itself. Sacred music is not the only type that holds this power; any type can be sacred if it leaves us with gentleness and kindness in our hearts.

We know that the medicine man in many of the tribes used music to drive out evil spirits and to help cure the afflicted. There are cases where music has been used as an anaesthetic for a surgical operation. It is being used more and more to aid mental and nervous conditions by psychologists. It appears that the medicinal value of music is greater than what has been thought. John Redfield says:<sup>1</sup>

".....the most frequent use of music is not as a means to any end, whether war, work, worship, or cure of disease, but as an end in itself; the frank enjoyment of music without any ulterior thought or purpose but simple relief from the

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1. Redfield, John-Music, A Science and An Art--Chapter VIII pp. 131-7

general irksomeness of life. It is out of such conditions as these that music has arisen. Man found himself plunged into a world of unpleasant sounds from which he could in no way escape. To alleviate his condition, man undertook to create for himself a world of beautiful sounds; and, having created a sound-world that was beautiful, he called it "Music."

Music has just as important part to play in the molding of character, temperament and other essentials that make a life either a success or failure, as any other educational activity he might experience.

Music explains as much of the historical social changes in the life of a nation as any history book that was ever written. Dr. Samuel N. Stevens, Dean of the University College, Associate Professor of Psychology at Northwestern University, says:

"Music is in a real sense expressive of the social, economic and intellectual life of the period in which it is written. Throughout the history of civilization we may find new understanding of the music through which they expressed themselves. For example, the early nineteenth century impulse toward Romanticism is directly expressed and fully reflected in the music of that day. The characteristic tonal, rhythmic and formal patterns of Schumann's music speak to us more plainly and more truthfully of the essential thought and feeling of that period than do volumes of verbal description. In exactly the same way, the music of the twentieth century reveals the inner quality of our own time. The bold rhythms, the harsh dissonances, the abrupt shifts of key, if any, are expressive of a machine age, of a rapidly changing industrial society, of a people who have been terribly hurt and in whom the struggle between feeling and intellect has been temporarily resolved through fear in favor of a more aggressive approach to reality. On the other hand, we find creeping into the modern scene the softer and more primitive response of a

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1. Stevens, "varied values"  
Ed. Mus. Magazine 18:7 Sept.-Oct. '38  
as well as music.

human nature that cannot permanently accept the philosophy of despair.

The emphasis in modern music education on performance has contributed significantly to the enrichment of human personality. To acquire even a partial mastery of some musical instrument gives to the growing child and to the adult alike an added sense of achievement, and a new vehicle of expression. In a social-economic setting characterized for the most part by a mass indifference to the individual as a person, the training of students, whether they be young or old, in the art of musical expression and social participation constitutes one of the distinct advances in the adjustment of the educational program to meet contemporary needs.

Music may become a controlled means of effecting emotional release. Listening is an active, not a passive, phenomenon.. The art of good listening may be acquired and the aesthetic returns to the individual whose listening has been conditioned to habits of discrimination may be very great. Comments made by hundreds of students who have taken our courses in the "History and Enjoyment of Music" reveal that they have not only gained certain intellectual insight but have found sources of strength from the act of responding critically and creatively to the music programs. This has been particularly true in the case of adults who have had to undergo significant social and economic adjustments because of the stress and strain of recent years. Listening to the music offered them in the course brought them insight, peace and aesthetic enjoyment."

Because of such values we may see music education become more and more the center of all education programs. Creation of music will become greater and the United States will stand on the same level or above many of the more noted countries musically. What is much better, however, will be the enrichment of the cultured experiences of the passing generations, which will bring about a better people as well

Music is a study of the most interesting, useful lasting and pleasurable of educational experiences. As has been stated, music is definitely linked with every subject in the curriculum. English, for example is considered the most important subject in the curriculum. A large vocabulary is one of the first requirements: a vocabulary with ready, accurate and pleasing utterance. Vocalization, pronunciation, enunciation have values both psychological and aesthetic; the rapidity of our thinking is controlled by the fluency of our speech. Reading is made easier through good spelling and in order to spell one must have a keen sense of hearing. Concerning this, Martha Mackenzie says:<sup>1</sup>

"The student in the singing and ear-training classes is thus better equipped for English than his less fortunate classmates. The objectives to be accomplished in the English course should be: Facility of expression, power of interpretation, and appreciation. By the singing of good songs, the playing of fine music, and listening to the best in music the attainment of these objectives should be facilitated.

Greater interest can be aroused by having the class hear music which is linked definitely with the literature of a particular period. For example: The ballet music from Faust, by Gounod, may be used to create desire for a fuller knowledge of the life of the Egyptians. The ballet opens with the "Dance of the Nubian Slaves." "Salambo," by Flaubert, describes Carthage and introduces pictures of slave-life and the Nubians. The theme of Cleopatra and the Golden Cup introduces the famous quest of Egypt. In this connection the student might read The Life of Cleopatra by Plutarch, from which Shakespeare derived his Antony and Cleopatra. The "Antique Dance" brings forth Aspasia. She was a highly cultivated woman

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1. Mackenzie, "Fusion of Music with Academic Subjects" Mus Ed Natl Conf Frbk '35 pp. 182-4

who greatly influenced Pericles and the ruler of ancient Athens; one should read Plutarch on Pericles and histories of Greece in the Periclean Age. During the dance of Cleopatra and her slaves, Lias appears; she was a professional beauty to whom the Corinthians built a statue. The charming "Mirror Dance" of Helen of Troy will lend interest to the reading of the Illiad, The Odyssey, The Aeneid.

In the same Mendelssohn's Midsummer-Night's Dream Overture can supplement the reading of Shakespeare's Midsummer-Night's Dream. As you are aware some of the richest and greatest song lyrics have been set to music by our best musicians. Students' interest can be aroused and stimulated by combining the singing and English classes in a program consisting of such material."

A knowledge of music also will aid the student of foreign languages, because of his familiarity with the different words he has learned in songs of let us say, for example French, Italian or French origin. Then, too his knowledge of musical terms in foreign language is quite a help.

In History we also find a link to music. In studying history we study the manner or tendencies which prompted certain changes to be made in the government and lives of its people during different periods. In folk songs may be traced the feelings and desires of a people of any period throughout the history of that nation. Thus the history teacher would be wise to urge his students to study music in conjunction with his subject.

Of the study of Civics and music, Martha Mackenzie says:<sup>1</sup>

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1. Mackenzie, "Fusion of Music with Academic Subjects" Mus Ed Natl Conf Yrbk '35 pp. 182-4

"The object of the teaching of civics is training for good citizenship. This rests in part on proper emotional experiences and participation in wholesome civic activities. The values sought are social and moral. We are well aware of the values of music as an "emotional stabilizer," particularly through group participation in singing or playing a high type of music. And when is the social tendency more highly sensitized than when singing in these groups?

The important factor for the social studies teacher is to seek to establish the "socialized point of view." Here again, there is no greater opportunity for the development of social feeling than in a properly conducted singing or orchestral group."

In the science studies we have a connection with music, for example through the study of acoustics and sound waves. In mathematics we have an approach to music through value of rests, notes, rhythm signatures, etc. Imagination is a strong factor in this subject, so that here again the music student would have the advantage.

Of the correlation of physical education and music

Martha Mackenzie says:<sup>1</sup>

"Physical health conditions every human activity and situation. The average person does not realize how much more vitality and consequent happiness would be his throughout life if he developed his breath capacity by regular and active use of the lungs. In no classroom is breathing emphasized as in the physical education department. Also the study of rhythm, phrasing, and form is an asset in perfecting folk and other dances."

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1. Ibid., "The Relation of Music to the General Curriculum,"  
 Mus Ed Natl Conf Trk '33 pp. 27-31



Of religion Martha Mackenzie says:<sup>1</sup>

"In the singing of religious and inspiring songs the individual is being trained to a certain extent in fundamental morality and religion, one of the best and most legitimate opportunities for much needed spiritual guidance."

There are, perhaps no subjects as closely interrelated with music as the graphic arts and drama. A song writer may be inspired by a great painting as he looks at it to write a song and likewise a painter may sketch a masterpiece as he listens to some piece of classic music, and a dramatist dreams of characters for his play as some haunting melody rings in his ears. In all three of these subjects the students should be taught to know and enjoy beauty; to develop good tastes and imagination.<sup>2</sup>

"Nothing is more debasing than vulgarity--vulgarity in architecture, furnishings, dress, music, drama, as well as in thought and deportment. The study of each of these arts develops capacity for understanding and absorbing the others.

The moral character of people is greatly influenced by the quality of their pleasure life. An important social service the school can render is the cultivation of tastes for real music and the ability to pass adequate judgment upon the quality of musical compositions."

Music has always had an important part in the development of culture in a nation.<sup>3</sup>

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1. Mackenzie, "Fusion of Music with Academic Subjects"  
Mus Ed Natl Conf Yrbk '35 pp. 182-4
  2. Ibid
  3. Haydon, "The Relation of Music to the General Curriculum"  
Mus Ed Natl Conf Yrbk '35 pp. 27-31

"The role of music in the educational system of the Greeks has often been referred to, although what the writers meant by the term music in that civilization was probably very different from what some of the more modern writers may have supposed. But, be that as it may, there was doubtless a very considerable activity in both, the practical and theoretical aspects of music in the sense we now use that word. In Elizabethan England every gentleman was expected to sing his part when the songbooks were passed about after dinner. From this fact alone, as evidenced in the writings of Thomas Morley, we may conclude that music was a part of the educational experience of every youth who hoped to rank as a gentleman.

Present-day social conditions in America are of quite a different order, but music still holds an important place in the educational system. The average American, however, is likely to be somewhat self-conscious in matters of art and music. Fortunately, thanks largely to the efforts of the music educators of the country, this situation is rapidly changing. Men and women of all walks of life are displaying a more intelligent interest in art. I believe we can partly credit the depression for this change in attitude. The realization of the importance of some contact with things beyond the harsh realities of life seems finally to be making its way to ever-increasing circles of people."

A probable cause for music's position in the school educational program is a certain narrowness on the part of all the teachers and administrators in general. Teachers become so self-centered in their own particular subject that they never give the other subjects in the school program credit for their part in developing the mind and body of the students. Let us ask ourselves this question: "Do we as musicians have an intelligent interest in fields other than our own?" If we haven't an understanding of the many problems which the principal faces, how can we

expect him to take an intelligent interest in our subject.

On this topic Mr. Haydon offers this solution:<sup>1</sup>

"The sum and substance of what I have to suggest by way of remedy to the most fundamental of our ills in music education is a plea for a more liberal education, first for ourselves that we may, among other things, be better able to maintain a perspective of the whole situation, and, second, for all others that they may in their turn realize something of the possibilities in the matter of the relation of music to the general curriculum. For ourselves, since all reform should begin at home, let us resolve to read a book a month on some subject other than music, and to attend some of the meetings or lectures that are available from time to time in almost every community on subjects other than music. Let us equip ourselves so we can talk intelligently with our associates on varied subjects. Let us try to evaluate all these matters in terms of their own criteria and in terms of any possible relation to music. This is one way, at least, in which we can aid the cause of music in general by becoming broader, more sympathetic members of society. Thus we may hope to command in some measure the respect of our colleagues in other fields--all this, of course, with no lessening of our purely musical activities--so that we can demand that they in turn may in large numbers at least, gain some appreciation of the relation of music to the social scheme in general."

We could go on forever elaborating on this particular theme with many variations, but Mr. Haydon sums it up in this manner:<sup>2</sup>

"....All education must include not only the preparation of the individual to earn a living, but also the equipment that will enable him to live an abundant life when his economic problem has been solved. Music figures naturally in this scheme of full living, but to do so it should begin to function early in the life of

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1. Haydon, "The Relation of Music to the General Curriculum" Mus Ed Natl Conf Yrbk '35 pp. 27-31
  2. Ibid

every individual. This idea should be a part of a really comprehensive definition of liberty. And, finally, every music educator can play his part in the regenerative process not only by perfecting himself in his art, but also by broadening his interests so as to gain some perspective of the field as a whole. Thus may he come to command the respect and cooperation of all, and lay the foundations for the solution of a very vital problem of the age in which we live."

John Redfield says:  
The relation of music to the general curriculum we must say, then, is a very close one. Music plays just as important a part in the education of a child as his academic subjects. Then too, since music has been shown to play an active and essential part in the social and economic life of man, his training should begin when he is young and should be emphasized throughout his training period, as much as his other subjects, so that he may enjoy these cultural experiences in later years.

Because of these many contributions to the welfare of mankind and its varied vocational values, we may look to the future with the assurance that music will become one of the most essential subjects in the school program.

Mr. Haydon says:<sup>1</sup>

"Each subject in the high school curriculum is judged by its supporters by the following aims:  
Has it vocational value? Has it citizenship value?  
Does it develop the individual? Has it cultural value?"

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1. Haydon, "The Relation of Music to the General Curriculum"  
Mus Ed Natl Conf Yrbk '35 pp. 27-31

1. Redfield, John, Music: A Science and an Art Chap. VII  
pp. 98-103

Music can answer "yes" to all these questions-- and because of its power to aid in development of the fundamental factors involved in these values, helps the individual to promote successfully all other subjects."

True, we say, there is a connection between music and the other studies, but what does music give us that the other studies do not? Perhaps we should say what is music?

John Redfield says:<sup>1</sup>

"Music, then utilizes eight factors: melody, harmony, rhythm, form, tempo, dynamics, tone-color and nuances. But it utilizes them in a particular way, to the end that the completed product compounded of these eight factors shall satisfy a certain very definite condition, viz., that the product shall be beautiful. Unless the end attained is such that we recognize it as beautiful, then that which we have produced is not music. The attainment of that which is beautiful is the necessary condition for the production of music; though we speak with whatever tongues, if we have not beauty it signifieth nothing--condition, so too is it the sufficient condition; with whatever tongues we may fail to speak, if we still have beauty it is enough--it is music.

Music, then, is a utilization of melody, harmony, rhythm, form, tempo, dynamics, tone-color, and nuance, in such manner that the result produced is recognized as beautiful. If rhythm alone, or melody or harmony alone, produces what is beautiful, then it is music."

Music, then gives to us an aesthetic value. It brings into play our emotions, feelings. There is hardly a living thing that is without feeling. The children of the very lowest mentality should be able to derive some enjoyable benefit from music.

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1. Redfield, John Music-A Science and an Art Chap. VI-VIII pp. 98-103

## Chapter II

Validity and Description  
of Music Tests

In an instrumental music class the writer has come in contact with a child that is twenty years old and a sophomore in high school. This individual is classified as a high grade moron. He was allowed to study music because he seemed to have some desire for learning in this field. His parents are very musical and no doubt he has some of their talent inborn. When given a musical aptitude test he made an average grade, however he was classified as of low mentality. His main difficulty in music is in his ability to retain what he has learned. This was first noticeable in the study of scales. When asked to play a scale he had played with reasonable assurance the day before he was unable to do so--he had forgotten he had ever studied scales. Yet a few days later he could again play the same scale he had been asked to play. At different periods his mind will wander, yet when it rights itself he remembers what has been taught him beforehand. It would seem that of all things music would be the one study he should not take. Yet this person has experienced something that would have been otherwise denied him. His small accomplishments on his instrument has given him a certain pride and a feeling of satisfaction. It has opened up a new way to express himself by playing on his feelings and emotions. He is more alive mentally--he is doing better work in his other subjects.

Undoubtedly the study of music has played an important part in his meager success.

Undoubtedly, then, there is something mystical in the manner with which our emotions govern our thoughts, deeds, feelings and ability to learn. It is hard to teach an unhappy child. Thus by gaining control of our emotions through music we have accomplished a lot in the making of a good pattern to use in shaping and molding a successful life.

Today we are confronted with the problem of testing. Ever since Binet's experiments proved successful we have accepted more and more the value in knowing the mental ability of the child. Every educator or psychologist has concerned himself with making a test that will aid him in solving his own individual problem. In determining musical ability musicologists have done just this. We must remember that in testing we cannot be absolutely certain--no test is absolutely infallible. Of the value of tests James Mursell says:<sup>1</sup>

"Perhaps the best way to think about the value of tests in education is as follows. We all know that in the work of teaching we constantly undertake to make comparisons on the basis of quantity. For instance, we say that one child is more or less musical than another, that one child has made more or less progress than another, that one educational method produces greater or smaller results of some kind than in some ability or attainment as we move upward from grade to grade. Of course a great many important decisions are based on such quantitative judgments and comparisons. For instance, we may give a boy a certain bit of

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1. Mursell, James L. & Glenn, Mabelle--The Psychology of School Music Teaching Part VI--chap. XIII--pp. 323-373

Division of Instruction  
Arthur J. ...

vocational advice because of our opinion as to the amount of talent he possesses; we may select or reject a certain pupil for our high school orchestra on the ground of the amount of his attainment as compared with another; or we may decide to use a certain classroom method for the reason that we believe it accomplishes more extensive results in a given time than some other. All that tests undertake to do is to remove these judgements of amount, of greater and less,--these quantitative judgments in short, that are so important in education--from the realm of guess into the realm of reasonable certainty. Absolute certainty we can never have, and we should never criticize a test because it is not infallible. The real question is whether it is less fallible than our unaided judgment. This is exactly the value of tests in other fields, where they have had strikingly beneficial results, and we may hope for just the same kind of development in music."

"In particular, we would like to urge upon the reader the unwisdom of taking extreme attitudes on this question of music tests. On the one hand we have extreme attitudes of negation and rejection. For instance, Davison rather rhetorically says that when it is possible to measure a child's love for his mother, then, and not till then, it will be possible to measure his love for music. But this is not a fair statement at all, for most people who believe music tests do not have in mind anything so extensive. All they claim is that there are many very important factors in musical ability and training which can be measured, and with valuable results. On the other hand we have those who want to make music testing the foundation for the entire scheme of school music. But again we have an untenable position. If our tests in music were as excellent as those in some other fields of education--if we had anything really comparable with the Stanford Achievement Tests, or the Stanford-Binet-Scale--then there might be something in such an idea, although even then test results are not permitted to decide everything, without the consideration of other factors. But such tests have by no means been developed in music. Our position is that existing tests



may be very helpful, that their further development is very desirable, and accordingly that everyone in music education should have at least a general understanding, though not necessarily an expert knowledge, of what is offered."

Perhaps at this point it would be best to mention briefly a number of the values which are to be found by the teacher in the existing musical tests. It would be best here to let Mr. Mursell sum these up:<sup>1</sup>

1. "Tests may give us considerable help in deciding as to the innate musical ability of the individual pupil, or at least they may help us to decide upon the extent to which he possesses certain abilities, such as a keen sense of relative pitch, a developed feeling for tonality and so forth, that seem important constituents in musical ability.
2. Tests may help us to foretell the probable musical development of a child better than we could without them.
3. Tests may help us to select from a large group of pupils those who are very musical, and those who are relatively unmusical. A test may do this in far less time than would be possible in any other way. No doubt an experienced teacher, after perhaps a semester's contact with such a group, will have formed pretty reliable judgments. But a good test may give us a judgment as reliable, or even more so, with the expenditure of only an hour's time.
4. Tests often discover ability. Frequently the most experienced teacher will fail to recognize the presence of outstanding ability in some shy or stubborn child. If we can discover this by a good test, it may be the basis of helping the child to a better orientation to school and to life by capitalizing the ability he is shown to possess.

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5. Tests may help us to diagnose the secret of certain weaknesses or defects which appear in the child's musical development. For instance, we may have a child in a violin class who seems incapable of playing in tune. If on the other our test shows that his sense of pitch is excellent, we make quite a different decision. In the first case we transfer him to a piano class. In the second, we look for the source of trouble in his mechanics.
6. Tests may help us to evaluate certain methods of teaching, by giving us an exact account of the results these methods achieve, which we can somewhat confidently compare with the results of other methods.
7. Certain kinds of tests may be used for motivation. This is possible with tests of achievement, but never with tests of innate ability. For instance, we might give pupils a sequence of sight-singing tests which would show them their own progress in an interesting way."

It would seem that decisions as to the educational and vocational welfare of the students should not be based solely on the results of tests. Such elements as the teacher's judgment, personality factors, environment at home etc., must be reckoned with. But the test will be very valuable if used with discrimination.

We might say that the aim of tests is to help our judgments about human beings to be more certain and exact. What then are the criteria of a good test? What points should we take into consideration in judging a test? Again Mr. Mursell gives us some points on how to judge a test.<sup>1</sup>

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1. Mursell, James L. & Glenn, Mabelle--The Psychology of School Music Teaching--Part IV--Chap. XIII--pp. 323-373

1. "A good test is objective. This means that its result is not merely the outcome of some person's private viewpoint. If we were to raise the question as to whether Mozart was a greater composer than Beethoven, we might argue about it endlessly and fail to agree. But if we ask whether Mozart wrote more consecutive fifths than Beethoven, we could work out an answer to which everyone would agree. In the one case we have mere subjective opinion. In the other, we are dealing with an objective, real situation. Again, if we ask whether pupil A reads better than pupil B, and if so how much, every teacher who has worked with the two may have a different opinion. But if we give both A & B the same passage to sing, and A makes five mistakes to B's nine, we have an answer, which for whatever it may be worth, cannot be questioned. It is this quality of being entirely removed from the personal opinion of the examiner that constitute objectivity in a test. We achieve it by defining with great care exactly what we are testing, and then creating situations such that the pupil's responses will be confined within definite and narrow limits. For instance, the Seashore Test of Sense of Pitch is highly objective. It consists of one hundred comparisons between the pitch of two tones, and in each case the subject is called upon to decide whether the second tone is higher or lower than the first. Always he is bound to be either right or wrong. When we score the test, our personal opinion has absolutely nothing to do with the result. We see here an illustration of our two conditions. There is no doubt as to what is being measured; it is the ability to discriminate differences in pitch. The pupil is placed in a situation where he must make responses which cannot be otherwise than right or wrong. The test in the new Kwalwasser-Dykema battery, however, in which the subject has to pick out the better of two different terminations of the same melody is probably not so objective, for clearly there might be a real, expert difference of opinion as to which of two such endings really was the "better." Thus the pupil's response is not so certainly right or wrong as in the former

case. We should notice that objectivity is a matter of degree, and that the best tests do not always have 100% objectivity, though they always rate pretty high in this respect.

2. A good test is reliable. We say that any measuring device is reliable in so far as it gives us the same result when applied twice to the same facts. A tape measure made of elastic would be extremely unreliable, and so is one's guess at the weight of a suitcase. There is no such thing as a perfectly reliable measuring device. A fine automobile engine is accurate to within one-thousandth of an inch, because the gauges are reliable to that point. But it is never absolutely accurate. When we measure mental processes, and the results of education, unreliability of a test may be, we can see from an illustration in general education. Suppose we set up a test for college entrance that is quite unreliable. Eighty percent of our candidates pass it. But when we say that it is unreliable, we mean that if all the candidates took it again, we could not be in the least sure that the same 80% would pass again; and that, in fact, they probably would not. So whether a person is failed by such a test will depend very largely on chance. It is just as if we proposed to admit people to college if they came to a certain height, and then measured their height with an elastic tape measure. Once more, college entrance would be a matter of luck, for some of the tall people might get a short measurement and vice versa.

It would be better for the music teacher to have reservations about any test whose reliability is uncertain. It would not be wise to base important decisions on the results of any test unless you know it to have a high reliability.

This raises the question: How is reliability determined?<sup>1</sup>

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1. Mursell, Mames L. & Glenn, Mabelle-The Psychology of School Music Teaching-Part IV Chap. XIII--pp. 323-373

take Reliability if expressed in what is known as a coefficient of reliability. This is obtained by giving the test twice to the same group (probably as two equivalent forms of the same test), and comparing the scores of the individuals in the two cases. The coefficient measures the amount of agreement between the two sets of test scores. If it is plus 1, then each person has made exactly the same score each time, and the test is perfectly reliable. If it is -1 then the order is precisely reversed, the person with the highest score on the first testing making the lowest on the second. If it is zero, then there is simply no relationship between the testings, the test is said to have a zero reliability, and the score obtained by any person on it is a matter of pure chance and so quite meaningless. We would say that any test with a reliability much below .60 is not very valuable educationally, for if it is repeated, there is a chance that any given individual will greatly modify his record, and the element of luck is altogether too great.

Among the many causes of unreliability we will here mention only the most important one, and this is shortness.<sup>2</sup>

The longer the test, the greater the reliability. For instance, if we want to measure a person's sight-reading ability, or his power to discriminate consonance and dissonance, or the keenness of his choice among melodic endings, and only give him one or two tries, it is obvious that all sorts of things may arise to disturb him. He may be temporarily astonished at the form the test takes; or the instances we choose may be especially hard for him; or one or more other disturbing circumstances may be present which prevent his doing his best. Or, on the other hand for some reason, he may be able to do far better than his average,--for instance, if he happens to know the passage we choose for sight reading, or to have studied the few dissonances we present, or to be familiar with the melody in question. But if we give him enough instances, all such special factors tend to cancel, and we get a much fairer picture of his real ability. Trying to judge a person on a very short test is like trying to find out the constitution of the ocean floor by scooping up just one bucket full. The more samples we

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1. Ibid

take, the more accurate our ideas become. Hence, if the teacher wants to make a test, it should always consist of a considerable number of situations,--the more the better--calling for relatively brief responses.

3. A good test must be valid. That is, it must really measure what it purports to measure. For instance, we have heard music teachers complain that the Kwalwasser-Ruch test of musical Accomplishment does not measure innate musical ability. This is a perfectly true statement, but a very stupid one. The battery undertakes to measure certain items of musical knowledge and skill. For these it is valid. But it has no validity for innate musical ability, and does not pretend to have.

The question of validity may be a very subtle one. For instance, we may make a test calling for the writing down of certain grammatical forms in a foreign language, and run it with a time limit. We may find that some person who actually has a very good knowledge of the language does far worse than another person whose actual language mastery is quite mediocre. The reason may be that, instead of language mastery our test is really measuring the ability to write down grammatical responses very fast, and with a minimum of cogitation, in a given situation. Or again, some ordinary essay type examinations are really much better measures of a pupil's ability to fill several blue books in two or three hours, than of his mastery of the subject. So this raises the question as to how we determine validity. We mention here the two most common methods. (a) By the judgment of experts. The test items in the Kwalwasser-Ruch battery were selected on the basis of the most representative courses of study in music, so that within its limits, this test series represents expert opinion on what the music pupil ought to know. (b) By correlation against criteria. For instance, we may take a group of pupils, give them six Seashore Tests, and then have a teacher who knows them well take estimates of their musical

ability. After this we may determine the degree of relationship between test scores and ratings of ability. If this relationship is close, we would say that the Seashore Tests are valid measures of musical ability as estimated by a music teacher; if the relationship is remote, we would say that they are not.....

Another point to consider in judging a test is the case with which it may be administered. Robert Seashore has devised probably the best of all rhythm tests, from the standpoint of reliability, validity, and objectivity. But it takes too much apparatus, and technical skill to give it. There seems to be difficulty in giving sight-singing tests simultaneously to a large group. They are all individual tests, thus less usable than they otherwise might be. A test that would call for intricate statistical methods in rating, would hardly be a good one. A test would not be very good if it depended on group judgment of experts for its rating.<sup>1</sup>

4. "It is a great advantage to have published norms for a test. A norm is simply a statement of the levels of performance of considerable groups taking a test. For instance, we may have a norm for all sixth grade children throughout a city system, a state, or the United States, or a norm for all ten year old boys or girls in a system etc., etc. Norms, in short, are stated in a great many different ways. They are useful for purposes of comparison. Without them, our test results are much less meaningful and suggestive. But they should never be crudely used as standards. For instance, if a given grade or a given individual does not come up to a national norm, this is not necessarily a sign of deficiency. For the whole scheme of

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education in the particular system may be such that while it produces low standings in the particular test under consideration, it may compensate for this by producing high standings elsewhere."

In summarizing we find that tests have five points by which they may be judged. They are: (1) A good test must be objective; (2) A good test must be reliable; (3) A good test must be valid--must hold to its purpose and measure what it was intended to measure; (4) A good test must be easy to give or administer; (5) A good test should have an established norm.

At this point perhaps we should give a brief description of a few of the music tests. This will not be an exhaustive survey of every available test, but merely an idea of the tests in the field, and characterize some of the more recognized tests that have been and are now being used in school work.<sup>1</sup>

#### 1. THE SEASHORE MEASURES OF MUSICAL TALENT.

This is one of the oldest, and probably the best known, set of music tests. It consists of six tests which are given by means of the phonograph. a-sense of pitch:-- This test consists of one hundred pitch comparisons of varying difficulty, the subject being required to decide whether a second tone is higher or lower than the first. b-intensity discrimination:--This consists of one hundred comparisons of two tones differing more or less in intensity, the subject being required to decide whether the second is louder or softer than the first. c-sense of time:-- This consists of one hundred comparisons of the length of two time intervals marked

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off by clicks. d-sense of consonance:--  
 This consists of fifty comparisons between pairs of two tone clangs, the subject being required to judge whether the second clang is better or worse than the first on the basis of smoothness, the purity, and blending. e-tonal memory:--  
 This consists of fifty comparisons between two sets of unrelated tones, one tone in the set being changed on repetition, the subject being required to identify the changed tone. f-sense rhythm:--This consists of fifty comparisons between pairs of rhythm patterns, the subject being required to judge whether the second pattern is the same as, or different from the first.

No brief summary can do justice to the extensive literature on these tests. But the following seem salient points. a-This test battery measures innate ability, and ratings are not affected by musical training. b-with the exception of the consonance test, the objectivity of the measures cannot be questioned. c-the six tests have a medium of low reliability. d-as to validity, a simple statement is not easy to make. It has been shown that there is some relationship between success in these tests and continuance in certain schools of music. Wm. Larson has shown that pupils in the more advanced instrumental ensemble work in the schools seem to show higher than average ability on the tests. On the other hand, Brown has shown that there is almost no relationship between success on the tests and musical talent as estimated by a music teacher in school and one of the authors of this text (Mursell) has demonstrated the same lack of relationship between the Seashore Tests and various special musical abilities, like sight singing, or singing pitch, than between the tests and general music ability. e-School music teachers have criticized the battery on many grounds, some of which are not very fair. Probably the most serious criticism is that it tends to treat musical ability as a composite of many special abilities rather than as a functioning unit. The test against which most criticism has been solved is that for consonance. Many music psychologists

do not believe that there really are the specific degrees of consonance and dissonance which the test assumes. f-Our general attitude is that the full uses and limitations of this battery are not yet understood. Clearly we must not expect the impossible from it. We doubt very much whether it will give us a very good index of general musical ability, but it serves various purposes of real value in conjunction with other methods of testing along the line of predicting and analyzing special abilities and disabilities. As the pioneer test in the attempt to measure talent, it did awaken teachers to the possibilities of knowing definitely whether children possess talent."

Another type of tests are the Kwalwasser-Dykema (K-D) Music Tests. This is a battery of ten tests, given by means of the phonograph.<sup>1</sup>

A-tonal memory test:--This test consists of twenty-five pairs of tonal patterns of increasing length, the subject being asked to judge whether the pair consists of the same or different halves. b-quality discrimination:--Fifteen pairs of tones and fifteen pairs of chords are sounded with a difference intensity only, and the subject is required to tell whether the second is louder or softer than the first. d-Tonal movement--This consists of thirty four tone tonal patterns, which demand a fifth tone for completion, the subject judging whether this fifth tone should be above or below the fourth. e-Time discrimination twenty-five items of three tones each, with the first and third of equal length, but the second variable, the subject judging whether the three intervals of every item are the same or different in length. f-Rhythmic discrimination--Twenty-five paired rhythm patterns are given, differing either in intensity or duration or both, the subject judging whether the second is the same or different. g-Pitch discrimination:--Forty items, in each of which a tone is sustained

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for three seconds, either with or without a fluctuation in pitch, the subject deciding whether the tone has remained the same or has changed. h-Melodic Taste:-- This test consists of ten items which are repeated again, making in all twenty trials. In each item the first phrases of the two melodies are the same, but the second phrases are different. The subject is to judge which of the two concluding phrases is the better, on a basis of congruity with the first. i-Pitch Imagery:--Twenty-five tonal patterns are given in notation, and the subject decides whether they are the same as, or different from those on the page."

Much research has to be done before we reach final conclusions as to the value of this new battery. Actual Musical material is used which is a contrast to the Seashore test. Some advantages to this Kwalwasser-Dykema Tests are it is short, interesting, and not fatiguing. The administration and rating of the test is made easier by the blanks and scoring stencils that are supplied. Excellent norms are provided.

3. "Gildersleeve Music Achievement Tests. This battery, which has been rather widely used, consists of two forms, A & B, of the same tests, the two forms being of equal difficulty. This is a distinct advantage in administration. The tests measure the following abilities.
  - a-Assigning names to compositions played by the examiner.
  - b-Detecting changes in pitch, in meter, in key signature, and in meter signature.
  - c-Writings key signatures:--Locating in six different keys; the use of accidentals; knowledge of time signatures; transposition of a G clef phrase to the bass clef.
  - d-A multiple response test, containing fifteen main questions, which cover in some detail instrumentation, theory, history, and harmony.
  - e-Recognition of compositions from the score. This is distinctively a

test of knowledge about music, and of skill in using the notation in certain ways. It is quite unlike the Seashore Tests, in that it measures the results of training.

4. Kwalwasser-Ruch Test of Musical Accomplishment.

The aim of this test is to measure musical knowledge from the fourth to the twelfth grade inclusive. It consists of the following separate items. a-Knowledge of musical terms and symbols. b-Recognition of syllable names from notation. c-Detection of pitch errors in the notation of a familiar melody. d-Knowledge of pitch or letter names of bass and treble clef. e-Knowledge of time signatures. f-Knowledge of key signatures. g-Knowledge of note values. h-Knowledge of rest values. i-Recognition of familiar melodies from notation."

Some music teachers criticize these tests on the grounds that they do not directly measure musical ability or achievement. However, this is unjustifiable because this is expressly not their purpose.<sup>1</sup>

5. "Torgerson-Fahnestock Tests.

These tests are divided into two parts. Part A deals with theoretical knowledge of items, such as note and rest values, time signatures, pitch and syllable names, marks of expression, repeat bar, slur, major and minor key signatures, natural and harmonic minor scales. Part B deals with ear-training proficiency, and consists of four tests. a-Writing syllable names of twelve exercises from aural dictation. b-Writing time signatures and supplying bars for incomplete notation of four given melodic fragments. c-Detecting both pitch and time errors in notation. d-Writing notes on the staff from dictation.

6. Hillbrand Sight-Singing Test.

This consists of a four page folder containing six songs. The pupil is permitted to study the notation for a few minutes, and is then asked to sing, without help of any kind. The various errors made by the pupil are recorded on a copy of the songs by the teacher.

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1. Op. Cit.

7. Mosher Test of Individual Singing.

This consists of twelve exercises, which contain problems that frequently occur in school music, arranged in order of increasing difficulty."

Both the Hillbrand sight-singing test and the Mosher test of individual singing are individual tests. Mosher has tried to find some group tests which will be a significant index of sight-singing ability. In doing this Mosher investigated the degree of relationship between performance on his individual test and on seven group tests. That most indicative of sight-singing ability was found to be the ability to write tonal figures from hearing them.<sup>1</sup>

8. "Some Less Formal and Developed Tests.

Besides highly-developed published tests which we have described, and others like them, there are a number of measuring instruments which have never been standardized. But it is very well worth while for the school music teacher to know something about them, for they often suggest valuable informal methods of testing musical ability, such as that mentioned in Chapter Two.

LOWERY'S TESTS OF CADENCE AND MUSICAL MEMORY.

The cadence test consisted of fifty comparisons between cadences in various positions,--perfect, plagal, imperfect, and deceptive--the subject being required to say whether the second cadence of the pair was more or less final. The phrase test consisted of judgments as to whether two tonal sequences were the same or different when the only difference lay in the phrasing. The musical memory test consisted of ten musical sentences, followed by five variations on each one, the variations being interspersed with irrelevant items, and the subjects being required to identify the variations on the theme they had heard from

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the irrelevant material. In giving these tests, a piano was used. The test items are not published in complete form.

#### Tests by Revecz.

On the basis of his study of the prodigy Myiregehazi, Revecz drew up a series of eight tests of musical ability. 1-Clapping rhythms given either monotonically or melodically. 2-Absolute pitch, tested by reproducing a given transposition. 4-Relative pitch, tested by the vocal reproduction of an interval sounded on the piano, with a new note for its bass. 5-6-Harmonic sense, tested by ability to sing a melody given, and to play by ear a known tune. He regarded the ability to sing back a melody as most diagnostic of musical ability. He found that the ability to clap a rhythm is not highly diagnostic, but that instrumental reproduction of melody, absolute pitch, vocal transportation of an interval, and ability to analyze chords, are indicative of musical ability in the descending order given. His subjects were sixty-three boys from seven to twelve. Rupp's measures. Rupp undertook to measure eight abilities closely related to musicality. 1-Absolute pitch. 2-Discrimination of small differences in pitch. 3-Ability to recognize successive intervals. 4-Ability to repeat a melody. 6-Ability to sing and repeat a second part to a given melody. 7-Time and rhythm. 8-Chordal analysis.

#### Frances A. Wright Tests.

These tests fall into three divisions. Frances A. Wright: 1. List the student's repertoire. 2. Test on performance of one piece selected by the examiner and one by the student. 3. Piano sight reading from the Laurel Song Book. 4. Singing back a four measure melody. 5. Writing out notation of a melody given on the piano. Faw two tests: Music writing from dictation. Faw three tests: Two and three part dictation with modulations and difficult rhythms. These tests are intended for music students, but they are interesting and practical suggestions may be picked up from them by the school music teacher.

Mr. Mursell now gives us a summary:<sup>1</sup>

1. Tests in music, as in education generally, are simply devices for helping us to make more certain and accurate quantitative statements and comparisons. We should not expect too much from them; nor, on the contrary, should we feel that they have no value or place.
2. Tests should be evaluated on the basis of objectivity, reliability, validity, and ease of administration. The existence of published norms is a great advantage. All tests, whether formally published, or made by the teacher himself, should conform to the above four conditions.
3. A comment on the music tests discussed is here in order. They are samples of the available material, and fairly well represent its excellences and deficiencies. Obviously they tend to emphasize the more or less mechanical aspects of musical ability, and to stress knowledge and specialized skill. This in fact is their most serious weakness and it arises quite largely from the necessity of making them objective. We must remember too, that it does not yet wholly understand itself. Its aims are not entirely definite and clearly stated. Moreover, we can construct good tests only when we know exactly what to test for. As the aims of music education progressively define themselves, and the desirable musical-mental processes become more evident, new and better tests will develop."

## CHAPTER III

## Classification of Mental Deficients

We have discussed now at some length the values of tests, different points to consider in judging a test, and a brief description and characterization of some of the more recognized tests. It is only proper that we should discuss the importance of a correct classification for the mentally deficient children. If a child is to be aided in his ailment we must know first of all the causation of his trouble. This should indicate what type of remedial treatment, educational training and social guidance is required. It aids the school administrators in telling where to place the child, whether to assign the child to the class for crippled, blind, deaf, mental deficients, semi-sighted or disciplinary children. In most schools the local service clubs maintain free clinics where they test the child for defects in hearing, sight and other ailments. This too is a great aid in placing the child in the correct class. For example, if a child is found to have difficulty in hearing out of his right ear, the examiners suggest to the teachers that the child should be placed on the right of them in order that he may be able to hear out of his left ear. Quite a number of the school systems of our more progressive cities give physical and psychological examinations to every child when he first enters high school.



The even more progressive ones give these examinations to the lower elementary grades, and have re-inspections periodically. There are a few systems that maintain adjustment schools for both the elementary and higher grades. Here, all the work is individual. A child is allowed to progress as rapidly as he wishes or as slow as he wishes without the customary retardation of an entire group.

There has been great difficulty regarding the correct classification of mentally retarded children. Much confusion has arisen as to the mental inefficiency of a child from the standpoint of style and grade of his defect. A wide practice of misusing terms all due chiefly to the different systems of classifications, the obscureness of the causation, and, until of late, the inaccuracy in measuring the different stages by standardized tests. Concerning this Dr. Wallin says: <sup>1</sup>

....In the case of the living child, the conclusions reached regarding the nature of the underlying brain condition of mental defect must ordinarily be based on inferences drawn from the observation of outward signs and symptoms and the facts discovered from prior post-mortem examinations of similar defectives. Personal and family histories are frequently so barren, obscure, or involved, that no unambiguous clues can be obtained regarding the nature of the agencies responsible for the mental retardation. Until recently, conclusions reached regarding the degree of a child's mental deficiency were also largely inferential. They were based on the child's facial appearance, on

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1. Wallin, J. E. Wallace The Education of Handicapped Children p. 332

the diseases and defects discovered in a physical examination, on observed behavior reactions, and on the child's proficiency in school work. Too much dependence was at one time placed on the results of physical examinations. The nature of a child's mental deviations or personality make-up cannot be obtained from a physical examination but only from adequate psychological methods of examination. But no sufficiently adequate psychological examination existed until within our own day. The invention and standardization of a multitude of psychological tests and scales and the elaboration of systematic methods of psychological inspection during the present century has made it possible to measure objectively with a fair degree of accuracy the amount that children possess of many psychic and psycho-physical traits, and to differentiate various degrees of capacity or incapacity or different types of deviation."

There are five basic types of classification of mentally inferior children. To discuss these to any great degree would require a separate study all its own. We will, however have a brief reference to each phase of the subject. Feeble-mindedness, looking at it in the light of its causation, may be classified according to the manner of circumstances or factors which directly or indirectly produced it, or to the abnormal differences found in the tissues of the body. We have here two factors --Pathogenic and Pathology.

Dr. Wallin here explains the Circumstances of the origin of mental deficiency (pathogenic factors).<sup>1</sup>

"The causative factors are either primary or innate (or as they are also called, intrinsic, germinal, or hereditary), or secondary or acquired (also referred to as extrinsic, somatic, or environmental). In primary or inherited mental inferiority the causes have operated prior to conception, and have produced a defective germ plasm (the substance contained in the germ cells

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1. Wallin, J. E. Wallace The Education of Handicapped Children p. 333-6

by which hereditary characters are transmitted). According to the orthodox view, the defect in the germ plasm is due solely to what is sometimes referred to as "neuropathic inheritance," that is, the transmission of a taint inherent in the germ plasm of the individual's ancestors. The most important of such ancestral or hereditary nervous (or neuropathic) defects are feeble-mindedness, insanity, epilepsy, and mental idiosyncrasies. The author has reached the conclusion from independent investigations that the traditional view of hereditary transmission should be extended to include the transmission of defects produced in the germ plasm by vitiating environmental stimule. Any destructive incident environmental forces if sufficiently virulent and long continued may modify the parental germ plasm and the modifications thus produced may be transmitted to the offspring. Substances capable of injuring the germ plasm are referred to as blastophthoric. Experiments have shown that the germ plasm may be impaired by the entry of various poisons, such as alcohol, lead, and the toxins of disease, into the blood stream of the parents, and that the germinal modifications thus produced may produce various mental and physical defects, degeneracies, and deformities in the offspring for several generations. Defects of the germ plasm transmissible to the offspring may also be caused by a lack of essential elements in the parents' dietary, such as certain salts and vitamins. The conclusion reached by the majority of investigators that most cases of mental defectiveness originate from a defective (cacogenic) heredity would probably be correct if the conception of heredity is modified and enlarged as indicated above.

The secondary or acquired causes, such as poisons, infections, diseases, or mechanical accidents which injure the brain, act directly upon the body of the child after the union of the sperm and the egg. They may thus operate before birth, during birth, or after birth.

When mental defectiveness originates after birth, the child shows normal or fair mental development until the incidence of a severe accident or disease. After this, mental arrest or deterioration sets in, sometimes, however, quite insidiously. It must not be inferred from what has been said that all children who are born

mentally defective evince obvious signs of defectiveness at birth. In the majority of cases the defectiveness only becomes apparent gradually as the child grows older and falls more and more behind the normal standard. The acquired cases do not ordinarily show any of the grosser "stigmata of degeneration." These are more prevalent in the congenital cases."

The second factor has to do with the structural defects in the brain tissue. This delicate part of our body is the cause of many of the bodily defects of the mentally deficient--particularly in the cerebellum and the cerebrum. Although there are a varied lot of differences as to the brain defectiveness of the mentally deficient between the highest and lowest mentally, post-mortem examinations performed on the brains of mentally defective children have shown mysterious variety of conditions.<sup>1</sup>

"The "gross" cerebral defects, most of which are perceptible to the naked eye, include areas of hardening (or induration or sclerosis), or softening, incomplete development, or non-development (agenesis); or atrophy of parts of the brain, cavities in the brain (porencephaly), defective development of the convolutions, diminished size and weight of the brain, and excess of cerebrospinal fluid "which occurs particularly in hydrocephaly). Such gross brain lesions, however, are merely a minor basis of mental deficiency. The essential basis in the majority of defective children consists of structural defects which are so minute that they can only be detected, if at all, by powerful microscopes or appropriate chemical stains. Chief among such "microscopic" defects are numerical deficiency of nerve cells (neurones) in any part of the external layer of the gray matter (the cortex), but especially

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1. Wallin J. E. Wallace The Education of Handicapped Children p. 333-6

in the pyramidal layer of cells (the outer brain layer) in the prefrontal (and parietal) regions; imperfect development of the nerve cells in the same regions; the development of the nerve cells in the same regions; the development of new cells, which are largely functionless; and possibly the haphazard arrangement of the nerve cells, although Hammerberg maintains that the cells are just as irregularly arranged in normal brains. J. S. Bolton finds that the depth of the pyramidal layer in the prefrontal region of the brain varies directly according to the degree of mental deficiency, while E. E. Southard and Annie E. Taft conclude from the examination of ten defective brains "that at least the brains of least complexity are in a general way correlated with minds of greater range," although they note exceptions to the rule. Hammerberg considers that the stage of brain development attained by the idiot's brain corresponds to the latter stage of normal fetal life, while the brain of the markedly weak minded (possibly the imbecile) reaches the stage attained by the normal brain during the first years of life.

The brain defects to which brief reference has been made serve to explain the intellectual limitations of mentally defective children.

The prefrontal region and the pyramidal layer, which are the least developed in amentia (feeble-mindedness) and the first to undergo dissolution in dementia, are the last to evolve in the evolutionary process. The pyramidal layer becomes the distinguishing characteristic of the mammalian cortex (John Turner, G. A. Watson, and Brodmann). The prefrontal region of the cortex (and the parietal, which occupies the middle division of each hemisphere) contains the "association areas" which stand in direct functional relation to the higher intellectual processes, while the pyramidal layers serve as the physical basis of the "associational," "psychic," volitional and intellectual functions." (J. S. Bolton)

So much as to the classification of the mentally deficient according to the nature of causation of which there were two factors--pathogenic and brain pathology. Now we come to the classification according to special

physical or clinical type.

In classifying the mentally deficient children according to physical types we find that they may be grouped under a dozen or more types. Most of these types can be readily detected by the trained observer. Here again we will devote ourselves to the study of only the more important types and their characteristics. The first of these types being Cretins.

Scientists have shown that cretinism is due to the lack of development of the thyroid gland, located on either side of the larynx and windpipe. When this gland fails to function properly and its secretion and hormone is insufficient, cretinism results in the young and myxedema in the adult. These are some of the characteristics which are not apparent at birth.<sup>1</sup>

"A rough, dry, waxy skin, bloated appearance, a pendulous abdomen, scanty, coarse, dry, darkish hair, a large and long head, broad, thick hands, fingers square at tips, dwarfish stature, slow waddling gait, thick, indistinct speech, dull, apathetic, unobservant expression."

Mentally they are listless, slow, imperturbable, placid, docile, imbecilic, but they may improve considerable mentally and physically from ingestion of thyroid extract, especially if treatment is begun in early infancy. Untreated cases make little educational progress.

The intelligence age (that is, the test age as determined by the Binet scale) of five cretins and four cretinoids (whose characteristics are less decided than those found in frank cretins) examined by the writer varied from two to seven years, the

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1. Wallin, J. E. Wallace The Education of Handicapped Children, pp. 333-6

average being 4.8 years. The I.Q.'s averaged 43, varying from 24 to 68. Seventy per cent were diagnosed as imbeciles, twenty per cent as potential morons (who, while rating as imbeciles at the time, would probably advance to the level of morons), and ten per cent as morons. The cretinoids graded somewhat higher than the cretins."

The next type are the Mongols, Mongolians, or Kalmucks. These children are thus called because of the obliqueness of their eyeballs and the deep crevice between their eyelids. Here are some of their characteristics.<sup>2</sup>

"Puffy eyelids, frequent squint, a squat nose with flattened bridge, small ears, often crumpled and protruding, round face, chubby and often florid cheeks, deficient stature, a tongue which is often large, spongy, and furrowed, a short and broad head, with deficient occiput (back), square and broad hands, short fingers tapering at the ends, frequently incurved little fingers, large, clumsy, flat feet, a delicate and weak physical condition particularly susceptible to naso-pharyngeal infections. They are liable to sudden death, and most are short-lived.

The cause of the condition has not been definitely ascertained, but it is probably due to an arrest or perversion of fetal development. These defectives are often referred to as "unfinished" or "ill-finished" children, and the arrest of development has been ascribed to depleted reproductive power due to excessive child bearing or advanced age of the parents. But the ratio of the first, second and third born was appreciably higher among twenty-one Mongolians for whom the order of birth was obtained, than among 680 consecutive non-Mongolians clinic cases varying from idiocy to normality examined by the writer, while the ratio of the late born was decidedly less among the Mongolians. Almost one third of the

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1. Ibid.

last born among twenty-two Mongolians were also the first born. The average number of children in the families having the Mongolians, was 4.6, while the average was higher, 4.8, in the families of 894 consecutive clinic cases of various levels of intelligence. While the ages of the parents at the time of the birth of the Mongolians averaged about six years higher than the ages of the parents at the time of the birth of the other feebleminded children, the ages of the fathers of the Mongolians varied from twenty-three to sixty-four, and of the mothers from twenty-two to forty-five. Moreover, the ages of the parents of the Mongolians who were among the first born was not found to be high, as has been alleged. On the contrary, the parents of the Mongolians who were among the first three born, constitute the youngest group. Half of the Mongolians were born during the period considered most favorable for procreation, half of the mothers being less than thirty-nine. These results do not appear to warrant the conclusion that advanced age is in itself an important cause of Mongolism. It is probably caused by any agency which can produce generative depletion or perversion--infection, toxication, exhausted or depleted procreative energy.

There is no known specific medical treatment of recognized efficacy. The main reliance for improvement must be placed on educational measures.

Mongols are often superficially bright, observant, imitative, fond of music and dancing, and usually amiable and cheerful when intelligently handled. They often show considerable ability in reading, but little or no ability in arithmetic and limited ability in industrial arts work, because of their clumsy and incoordinate movements.

Ten per cent of thirty Mongols examined by the author were diagnosed as morons, and 86.6 per cent as imbeciles. Only one was classed as an idiot (3.3 per cent). The Binet ages varied from two to seven years, and the I.Q.'s from 19 to 63. The Mongoloids (whose physical characteristics are less marked) graded somewhat higher...."



The next group in our classification are the Microcephalics. This type is very distinguishable because of the smallness of the head, and the angular shaped forehead. The highest part of the head comes to a point and the lowest part is very flat. The brain of this type is very small, with small, simple folds. This person is very unreliable and given to violent outbreaks of emotions. Their speech is hardly understandable. They are quick and surprisingly bright, although being low mentally. They are imitative and said to be very difficult to teach. Dr. Wallin describes the characteristics of one example he used in his book.<sup>1</sup>

"J. C. is a microcephalic idiot, age 29.4 when photographed, Binet age 1.4 at age of twenty-nine. Head circumference 16.5 inches at age ten. Lower jaw prognathic, large mouth, hair on upper lip, eyes small and slanting. One brother a microcephalic idiot, and one cousin feeble-minded. Walked at three. Masturbates. Tends to mutilate hands and other parts of body, often rough with other children, playful, laughs without provocation, makes quick birdlike movements of the head, likes to show off. Capable of matching two colors, of selecting common objects by sense of touch, of dressing and undressing herself, although requiring assistance in lacing shoes, of carrying clothing from one place to another, and of carrying out one simple command, such as "get up" or sit down".

The next type is called the Sclerotics.<sup>2</sup>

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1. Wallin, J. E. Wallace, The Education of Handicapped Children, pp. 333-6
  2. Wallin, J. E. Wallace, The Education of Handicapped Children, pp. 333-6

"This term is applied to children who have areas of hardening (sclerosis) in the brain due to the overgrowth of the fibrous tissue which supports the nerve cells. The head is squarish rather than round, it is frequently enlarged, and massive locking, while the forehead is vertical, making the child appear impressive and more intelligent than he is. The so-called tuberous form is sometimes accompanied by rounded tumors in the brain cortex, kidneys, heart, skin, (adenoma sebaceum), and other organs."

A fifth group is the Hydrocephalics. This type also has a distorted looking head formation. This type differs from the Sclerotic in that the shape of the head is globular, or more round instead of square.<sup>1</sup>

"These children are so denominated because of the presence of cerebro-spinal fluid in the ventricles of the brain (internal form). The fluid frequently produces a pronounced expansion or a distortion of the skull, distension of the skin, and destruction of the brain tissue. The head appears globular, balloon-shaped or pyramidal instead of square (as in the sclerotic form of enlargement), the face appearing diminutive in contrast. The forehead tends to bulge forward, the eyeballs are often depressed, exposing the "whites of the eye" (sclera). The head often undergoes gradual expansion during a period of years until it may measure thirty or more inches in circumference.

Mentally, hydrocephalics vary from idiocy to normality, the external form producing less defect. They are educable according to grade of mentality, stage of the disease (whether stationary or progressive), and associated defects.

The causation is obscure, but most cases probably develop after birth from chronic meningitis, or some other infection. There is no specific cure, and the outlook is unfavorable in practically all the congenital, progressive and ventricular (or internal) cases."

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1. Wallin, J. E. Wallace, the Education of Handicapped Children pp. 333-6

Dr. Wallin describes here the characteristics of a specific case of this particular type. This is a description of a girl.<sup>1</sup>

"O. D.....who classifies among the higher grades of mental defectives, had at the time of the examination, at the age of 17.8 years, a Binet age of 8.2 years by the 1908 scale and 7.4 by the 1911, I. Q. 46, and inrate of psychomotor reaction (Sequin form-board) measured 6.5 years, according to the author's norms, whether based on the best trial or the average of three trials. She was very slow in her motor and intellectual reactions. In anthropometric measurements her percentiles were as follows: Standing height, eighth; sitting height, thirtieth; weight, tenth; right grip, ninth; and left grip, eighth. Her head was large at birth. The head girth at eighteen months was eighteen inches and at 17.8 years 26.5 inches. She did not sit up until eighteen months old, prior to which time her head had to be propped up with a pillow or supported by some one's arm....At the age of twenty-two, after a few months in the kindergarten and ten years in a special school in a city school system, she did about third-grade work in reading and spelling, and second, grade work in oral and written language and arithmetic. She did well in folk-dancing, fairly well in running, tactics, and marching, but poorly in mental and physical games, in which she was disinterested and lacked confidence. She did well in writing, brushmaking, plain hand sewing, and simple decorative stitching, and was excellent in sewed and woven basketry which she greatly enjoyed. Her greatest deficiency was in arithmetic, especially problem work, and her greatest capacities in writing and music. She showed poor judgment, gave good attention, made good effort, but timid and shrinking. Has always shown lack of self-confidence."

The Sixth type of mental deficient as to physical and clinical classification, has to do with the Paralytic or Plegic form. Here is a brief description of their most

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1. Wallin, J. E. Wallace, The Education of Handicapped Children pp. 333-6

outstanding characteristics.<sup>1</sup>

"The types of motor paralysis to which these children are subject may be of the spastic variety (in which there is muscular rigidity and increased reflexes), which shows that the lesion is in the brain, or of the flaccid variety (in which the muscles are flabby and the reflexes abolished), which is due to a lesion of the spinal cord. Both sides of the body may be involved (diplegia), or only one side (hemiplegia), or only the lower limbs (paraplegia). The paralysis dating from birth, due to prenatal disease, or inflammations, or birth injuries, are known as birth-palsies (or Little's disease). They are of the spastic type, and are more frequently diplegic than hemiplegic. Muscular incoordination is prominent, as seen in the writing which often betrays wild, irregular movements. Children with birth-palsy are often subject to slow writhing and twisting involuntary movements of the fingers and hands (aethetoid movements), which greatly interfere with the skillful use of the hands.

The post-natal type, due most frequently to injuries or infectious diseases, may be spastic or flaccid."

The range of mental ability for the paralytic form is very broad and varied. The mental level varies from that of the lowest idiot to the superior rank.<sup>2</sup>

...."Eighteen or 62 per cent of twenty-nine consecutive paralytics of various types examined by the writer in the St. Louis psycho-educational clinic were diagnosed as feeble-minded, 7 per cent as approximately normal, and 31 per cent as backward or borderline. Of twenty-seven crippled children of various types in the Dayton school for crippled children, 18.5 per cent varied in I. Q. from 56 to 74, 37 per cent from 78 to 95, 33.3 per cent from 99 to 121, and 11.1 per cent from 125 to 145. However, even some of those who apparently normal in intelligence are more or less irritable or emotionally unstable, or rather childlike or infantile. The birth-palsy cases

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1. Wallin, J. E. Wallace, *The Education of Handicapped Children* pp. 333-6
  2. *Ibid*

among defectives tend to be of higher intelligence than the post-natal cases, although they are frequently judged more deficient because of the physical disabilities and grave speech defects to which many are subject.

Many paralytics are capable of considerable literary advancement as well as improvement in motor coordination."

Another type of mental deficient children, according to physical classification, is the Epileptic.<sup>1</sup>

"The most prominent physical manifestations of epilepsy, which is essentially a disease of childhood, are the sudden, inconstant, involuntary seizures or convulsions, which are attended by loss of consciousness. The seizures may be of the grand mal type, in which the child falls to the floor unless protected and in which the various bodily members are thrown into violent contortions, the petit mal type, which is characterized by a momentary loss of consciousness, with slight localized motor disturbances, or none at all, the Jacksonian type, in which the jerking is confined to one member (for example, one hand), and the serial type (status epilepticus) in which many convulsions follow in rapid succession, the subject frequently remaining unconscious during the series of attacks. Some epileptics are subject to automatism (or "epileptic equivalents") in which condition they carry out acts with little or no consciousness. In this twilight state criminal acts may be committed apparently with little consciousness at the time of the crime and complete subsequent forgetfulness.

Many epileptics suffer from various temperamental and emotional disabilities--such as irritability, contentiousness, fickleness, impetuosity, sulkiness, irascibility, peevishness, anger, mendacity--and intellectual limitations, although some epileptics are normal or super-normal. About two-thirds of 333 institutional cases and 47 public-school cases examined by the writer were classified as feeble-minded, some, however, being demented rather than aments. Epilepsy may be a complication of almost any type

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1. Wallin, J. E. Wallace, The Education of Handicapped Children pp. 333-6

of feeble-mindedness (although very rare in Mongolism). Its tendency is to accentuate the degree of the mental deficiency and limit the possibilities of training. On the other hand, repeated convulsions may injure the brain and thus produce feeble-mindedness, backwardness, or dementia in subjects originally possessed of a fair or normal mentality. It is astonishing, however, how some brains are able to resist for many years the ravages of the seizures.

Epilepsy is still largely a morbus incognita, though many of the predisposing and exciting causes of convulsions are known. Many believe that a defective heredity is the underlying cause. The treatment is still largely symptomatic, the main reliance being placed on depressant or sedative drugs for aborting the convulsions, the regulation of the diet, outdoor employment, proper social diversions, protection against falls, life-long supervision, and educational training adapted to the subject's age, grade of intelligence, and the course of the disease."

#### The Progressive types.<sup>1</sup>

The typical feeble-minded child improves slowly up to the period of maximum physical and mental development, and does not dement until the period of senile deterioration supervenes. But deterioration may, and frequently does, occur in epileptic and hydrocephalic children, and is a typical phenomenon in the two following types.

Juvenile paralysis or general paralysis (Thomas Clouston), which is a disease of the nervous system due to hereditary syphilis. The mental inferiority may appear at birth but usually develops very slowly and insidiously until the physical signs appear (irregular, dilated pupils, absence of the light and accommodation reflex, fibrillary trembling of the tongue and lips, hesitant and indistinct speech, and developing paralysis of the limbs), when the dementia becomes markedly progressive. In a few cases the disease may be arrested by early anti-syphilitic

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1. Wallin, J. E. Wallace, The Education of Handicapped Children pp. 333-6

treatment. Dementia in children without antecedent insanity or epilepsy is usually indicative of juvenile paralysis (or paresis)."

Perhaps it should be made clear here that not all children suffering from syphilis are feeble-minded, but they are listless, below normal mentally, temperamentally unbalanced and they are unable to make the progress in school that is expected from them on the basis of their intelligence rating from their tests. Every child suspected of having syphilis should be given the Wassermann blood test, and if the results are positive should be given anti-syphilitic treatment.<sup>1</sup>

"Amaurosis or "amaurotic family idiocy" (B. Sachs), a type of infantile brain degeneration confined almost exclusively to Jewish children, previously healthy, begins about the third month, and leads to weakness of the muscles of the back and neck, blurred vision, eventual blindness, and a fatal termination from heart disease or pneumonia within a couple of years. On examining the retina a light gray oval patch containing a cherry red spot is found in the center of vision. Fortunately the condition is very rare. The author has met with only two cases, Jewish siblings, less than three years of age, unable to stand or sit, and almost blind, out of over four thousand children individually examined in several States during almost fifteen years.

A somewhat similar type of mental deterioration occurs among children of six or seven, previously healthy, and slowly progresses to a fatal termination in seven or eight years. These diseased are assumed to be caused by some toxin. There is no known cure.

Dementia Praecox. Reference is made to this condition because it is occasionally confused with

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1. Wallin, J. E. Wallace, The Education of Handicapped Children pp. 333-6

feeble-mindedness. It is a form of adolescent insanity (psychosis) which may effect both feeble-minded and mentally normal children after the onset of puberty, and which, in some of its forms, leads to emotional, instinctive, and intellectual deterioration, and conduct disorders. There is no known cure for this disease, although the hope is now extended that it may be prevented by safe-guarding the child from the effects of toxins and mental strains and stresses."

#### The Meningitic and Inflammatory types.<sup>1</sup>

"Mental deficiency may follow severe acute infectious diseases, such as cerebro-spinal meningitis, inflammation of the brain (encephalitis), and infantile paralysis, which may produce hardening and scar formation in the nervous tissue, and thickening and adhesion of the brain membranes which interfere with the cerebral circulation. Among 872 cases investigated by the writer, cerebro-spinal meningitis occurred 345 per cent more frequently in the personal histories of the feeble-minded than of the normal children. Unrecognized antenatal meningitis may be responsible for more cases of mental defect than is now suspected. Mental deficiency may also follow, although infrequently, some of the milder infections, such as scarlet fever, typhoid, diphtheria, or measles. Blindness and deafness are also possible sequelae of infectious diseases. There is, unfortunately, no medical cure for the mental defect after the brain damage has been done. The most important line of advance in this field is to safeguard children from these infections. Diphtheria and typhoid can now be prevented by the administration of proper antitoxins. The educational prognosis varies, in general, with the degree of the mental defect."

#### Infantile or infantilism types.<sup>2</sup>

#### The Sense Deprivation types.<sup>3</sup>

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1. Ibid
  2. Wallin, J. E. Wallace, The Education of Handicapped Children pp. 331-369



"The two most prominent characteristics of infantilisms are sexual and mental immaturity. These children are childish, puerile, emotionally immature, and weak and infantile in intelligence, but they are not always mentally defective. Some authorities believe that there are ten or twelve different forms or types of infantilism, depending upon the nature of the cause. In the so-called idiopathic form no definite cause is ascribed to a serious general disease or infection, such as tuberculosis, syphilis, malaria, or chronic intestinal infections. The most definite and clearly recognized types are due to deficient functioning of the glands of internal secretion (or endocrine glands), the best known form of which, cretinism (or hypothyroidism), has already been discussed.

"Pituitary infantilism" is due to under-functioning of the posterior lobe of the pituitary gland, which is a gland of internal secretion about the size of a hazel nut, situated at the base of the skull. When this condition develops before adolescence, the stature remains short, the hands and feet small, the beard does not grow, the genital organs remain undeveloped, there is an excessive accumulation of fat, while mentally the individual appears dull and torpid.

Some authorities believe that definite types of infantilism may be traced to malfunctioning of the thymus (a small gland below the thyroid) and pineal gland (situated behind and above the pituitary), but this is questioned by others. None of these types of infantilism responds favorably to the administration of glandular extracts except cretinism, although favorable reports from the administration of pituitary extract occasionally appear.

It should be noted that only a few types of subnormal children display decided infantile mental characteristics, namely, the cretins, the Mongols, many microcephalics, and many paralytics, especially the spastic cases."

The Sense Deprivation types.<sup>1</sup>

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1. Wallin, J. E. Wallace The Education of Handicapped Children pp. 331-369

"A child might remain immature or undeveloped and eventually stagnate as permanently mentally deficient because of congenital or early acquired blindness or deafness which has been uncompensated for, or uncorrected by, appropriate remedial and educational treatment. The marvelous extent to which the effects of sensory defects may be compensated for or overcome by the development of other sense organs is now well known. Had Laura Bridgman and Helen Keller been sent to an institution for the feeble-minded and been given merely the routine instruction provided in such institutions, they would probably have stagnated as feeble-minded and have remained unknown to the world. Appropriate training and instruction, if early begun, will remove mental deficiency due to sense deprivation (assuming, of course, that the sensory defect is not superposed upon a background of primary mental deficiency).

Children stagnating as mentally defective, mentally inferior, or savage, because of lack of adequate and appropriate social and educational contacts have been classified as "isolation" country is probably negligible."

A knowledge, no matter how brief, of the factors of causation, of the structural defects, and classification as to physical type of mental inferior should be had by all social workers and educators if they expect to be of any value to these children. Such knowledge will help put the work done for deficient children on more of a scientific basis and aid in the prevention of mental inefficiency and the increase of mental efficiency. It will prevent the many mistakes made purely on judgment. Still better, by knowing the cause and the clinical type we may be better able to tell what surgical or medical treatment these people should have as in the cases of epileptics,

cretins and syphilitics--the proper educational channels for Mongolians, microcephalics, or general paralytics.

There is no better treatment educationally for the mentally deficient than music. There was not one of all these types quoted that was utterly without feeling or emotion. True music could not be used to increase their ability. But music could soothe their feelings and soothe them spiritually. By gaining control of their emotions we could modify actions of violence to deeds of kindness, referring to the more criminally inclined mental deficient. In order to gain control of our actions we must voluntarily have some regulation of our thoughts for we live in care without prohibition. It is not words that start the millions of feet running to battle. Isn't it the music that makes us pull back our rifles and say, "I'm glad I am an American." Isn't it the beat of the drum and the war chant that sent the lowest form of man into battle? It's the soft, melancholy melody of the violin or singer that makes tears come to our eyes, or the quick, pulsating rhythm of an orchestra or band that makes us happy, gay, want to dance and be care free, free to forget our troubles. It's the playing of a sacred number on the church organ and the singing of the hymns that soothes our souls, uplifts us spiritually and makes us able to be more like

## CHAPTER IV

The Effect of Music on  
the Handicapped Child

There is no better treatment educationally for the mentally deficient than music. There was not one of all these types quoted that was utterly without feeling or emotion. True music could not be used to increase learning ability. But music could soothe their feelings and enrich them spiritually. By gaining control of their emotions music could modify actions of violence to deeds of kindness, referring to the more criminally inclined mental deficient. In order to gain control of our actions we must undoubtedly have some regulation of our thoughts for action is rare without premeditation. Is it not music that starts the millions of feet marching to battle. Isn't it the music that makes us pull back our shoulders and say, "I'm glad I am an American." Wasn't it the beat of the drum and the war chant that sent the lowest form of man into battle? It's the soft, melancholy melody of the violin or singer that makes tears come to our eyes, or the quick, pulsating rhythm of an orchestra or band that makes us happy, gay, want to dance and be care free, free to forget our troubles. It's the playing of a sacred number on the church organ and the singing of the hymns that cleanses our souls, uplifts us spiritually and instills within us a desire to be more like

Him. Feelings, emotions, thoughts, moods--yes, and music, are all entwined. Anything as universal as music must be of benefit and a blessing.

Mr. Haley, at one time warden of one of Indiana's Boys Reformatory's, noticed that the boy who was the most hardened criminal was the boy who had never had contact with music. Mr. Haley also noticed that the boys who could play some musical instrument or could sing to a certain extent were the boys who straightened out their shattered lives and went ahead and made something out of themselves.

The writer made the statement that in order to learn the child must be happy. Dr. Wallin says:

...."make the children contented, happy optimistic, and ambitious. It is known that agreeable feelings facilitate the normal functioning and augment the output of energy of the organism, while unpleasant experiences tend to inhibit the functions, depress the spirits, and devitalize the organism. The Training School at Vineland is a living embodiment of its famous motto: "Happiness first, all else follows." It is necessary to emphasize this objective in special-class work, because these children are at best unfortunate--always unfortunate in their mental limitations, which are frequently ineradicable, sometimes in their attitudes, often in the home treatment which they have received. Some have suffered neglect or abuse at the hands of the parents or siblings. Some have even been debauched in the home. Many have frequently been unfortunate in their contacts with other children, and in their experiences in the grades, where they have become discouraged by the fruitless attempt to master incomprehensible subject-matter."

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1. Wallin, J. E. Wallace the Education of Handicapped Children pp. 166-7

Perhaps at this point it would be best to see just how music does effect the handicapped child. We have learned that music effects him emotionally but how else? Dr. Wallin  
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says:

"Calisthenics and rhythm work, including folk dancing and eurhythmics (Dalcroze) accompanied by music. Music and rhythm make a very strong appeal to the mentally deficient and ought to be utilized in the physical training exercises whenever possible. This type of work is of great service in overcoming the awkward, clumsy, ungainly movements so characteristic of many defectives. Eurhythmics is a system of musical training accompanied by bodily movements, designed to develop coordination of the mind and body, physical grace and self-control, to improve the carriage, relax muscular tenseness, and develop hearing and musical appreciation. It is alleged that it is also of value in quickening the mentally deficient mentally. It should find a larger place in the special schools than is now the case."

Too true is this last statement. How often is the handicapped child allowed to enjoy music? Not very often, for the teacher is told that this child is "too dumb" to know anything about music, and "too dumb" to be able to appreciate music. Yet it is this very child that needs music above all subjects.

The Sensori-motor, manual, industrial arts, pre-vocational and vocational training of the mental deficient is more important than anything else. Here are some of the  
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reasons for emphasizing motor training.

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1. Wallin, J. E. Wallace The Education of Handicapped Children pp. 219
  2. Wallin, J. E. Wallace The Education of Handicapped Children pp. 245-6

"As already suggested, the major emphasis in the curriculum for defectives must be placed on the motor forms of training rather than on the literary forms of training for various reasons.

(1) The child is fundamentally a motor being. He is motor a long time before he becomes intellectual. Movement rests on an instinctive, impulsive basis--it is an irresistible impulse--while cogitation is an artifact thrust on the child by the exigencies of civilization. Movement satisfies a fundamental biological need.

(2) It is through movements that the child acquires a knowledge of the world. Movements bring him into intimate contact with his surroundings. Movements of the hands (and in early life of the lips also) enable him to explore objects. It is from these kinesthetic sensations that the child gets his vital, pulsating, trustworth knowledge of reality. He does not actually know what a ball is until he has handled one and obtained a host of new sensations: hardness, smoothness, resilience, elasticity, ability to roll and rebound, coldness, heaviness, etc. When there is conflict between the different senses, the appeal is always made to the kinesthetic sensations: that which is capable of offering resistance to muscular exertion must be real.

(3) Motor education affords excellent mental training. It offers opportunities to compare; judge, analyze problems, solve new problems, adapt means to ends, and coordinate movements toward the attainment of desired objectives. Just as motor education consists most largely in the development and refinement of muscular coordinations, so intellectual education consists largely in establishing associations between related ideas and in properly coordinating various mental processes. Knowledge is a system of correctly coordinated or related ideas.

(4) Motor training actually gives results. Experience shows that the mentally deficient are benefited more by motor, industrial arts and occupational training than by literary instruction."

The motor training of the child then is very important.

Music then is part of his motor training for we know that it stimulates thought, movement. Here are some examples of what

music does for the handicapped child and specific cases of  
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 musically inclined imbeciles.

"Most of the mentally deficient enjoy music, especially the rhythm, the quick staccato tempos, and simple familiar airs. Many possess considerable musical ability. Some can hum tunes who cannot read the words; some possess good voices and sing correctly in tune; some can learn to play easy selections on the piano, mouth harp, or different band instruments. Because of the musical ability possessed by some of these children the parents find it difficult to accept the examiner's verdict that they are feeble-minded.

H. D., who had spastic paralysis in the left leg, impaired vision, internal strabismus, at the age of 12 years had a mental age of 4.4 by the 1911 scale. She had acquired very little in school after three years of discontinuous instruction, but she could hum tunes, and play simple melodies on the piano by ear. She was able to learn the words to many popular airs and sing them fairly well. The mother protested against the diagnosis of imbecility.

F. C., a male imbecile with partial motor aphasia and a mentality of less than four at the age of 13.5, who could with effort repeat words fairly well but who talked in grunts and mumbles, was exceedingly fond of music, was able to hum a considerable number of tunes from memory, and partook with gusto in the singing in the Sunday school.

D. B., a very excitable, restless girl subject to athetosis, and having a mentality of three at the age of eight, sang catchy tunes readily, was very fond of the graphophone, and was able to select the disks she enjoyed and place them on the instrument, although she could not read a word."

A word now as to the value of music in the special classes or in the adjustment school.  
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"A special class without vocal and instrumental music is almost an anachronism. Music should be

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1. Wallin, J. E. Wallace The Education of Handicapped Children pp. 247-8
  2. Ibid



provided in abundance, not only for the sake of furnishing enjoyment to the children, but for purposes of training. It is a superior medium for arousing attention, energizing the child's activities, developing motor coordination and grace, training the voice, improving the articulation, developing a group consciousness, socializing the child, and providing esthetic culture."

The teacher plays the most important part in the education of the mentally deficient. The qualifications for the teacher of mental deficient are similar to those of the regular teacher, however there are a few traits needed in a superlative degree. This special teacher should have optimism, sympathy and a buoyant spirit about him. He must have patience and cheerfulness above all else. There are few teachers who are constantly patient and never become cross but when dealing with these special types the teacher must develop this trait. He must keep in mind that these students' minds work more slowly, listlessly, and no matter how hard they may work they can never catch up with the normal student. The teacher must exercise self-control and be able to meet defeat smilingly with a resolution to return to the task with renewed energy and determination. A sunny disposition is indispensable. A smile from the teacher will do more to break down indifference and do away with any hostile feeling of the child for being taught. There is no doubt that a child who has become discouraged, gloomy, listless, and pessimistic deserves a bright and cheerful teacher.

It is an easy task for a teacher to be kind to children who are normal beautiful and can be taught easily, but it is not easy to be kind and patient to these types that are peculiar--peculiar for no reason of their own.

Not only does music have an effect on the mentally deficient but here we present observations made by Paul E. Clifford, Civilian Bandmaster, Sing Sing Prison, Ossining, New York on the powerful effect music may have as a remedial factor in maladjusted lives.<sup>1</sup>

"Although the music company itself consisted of only a handful of men, it was astonishing and gratifying to see how quickly a great many of the men displayed an eagerness to learn music. It grew to be a daily occurrence to have inmates approach me throughout the yards, pleading to enter the music company. I perceived immediately that there was a colossal task ahead.

In the six years that have elapsed, the viewpoint that I had previously shared with thousands, that the inmate was a vicious type, has been completely eradicated from my mind. There are now over seventy men comprising a well organized band, an orchestra, a bugle and drum corps. The keen desire of the members to practice their respective instruments and become proficient has enabled them to overcome many delinquencies. I started a class for instrumentation and harmony, so that the men might have a better knowledge of both music and instruments. It was pleasing to note how many voluntarily registered for this course. I am happy to state that a number of them are now able to arrange and compose and that many of their numbers are often played by the band and orchestra. These studies were carried on not only in the music room, but also in the cells at night. Besides their many other activities, the band and orchestra have played over a coast-to-coast broadcast many times. The commendatory acknowledgments received are a testimony of the capabilities of the men, all

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1. Clifford, "Paul E. Music Within Prison Walls"  
Ed. Mus. Magazine 18.4 pp. 7 Mar-Apr.--'39

trained within prison walls. Although I was their teacher and director, it was only with the kind cooperation of Warden Lawes, and the helping hand of the late Mrs. Lawes, that these accomplishments were realized.

The average person needs to become acquainted with himself. He has a very inadequate conception of his own abilities and possibilities, and is more than likely to minimize and underrate himself. A wise philosopher said, "What a man thinketh of himself, that is it which determines, or rather indicates his fate." The Bible says, "As he thinketh in his heart, so is he." For the men who comprised the musical company, work was a delight, rather than drudgery. They possessed a determination to keep at their work until they had it mastered.

The idiosyncrasies of the men were varied. Temperaments dominate many. Most of the men are under tension. In view of this condition, it is surprising how well the musicians work in harmony and unison.

This harmonious unity will definitely be the deciding factor which will drive away from the men their conflicting desires and complexes. It will place a great number of them in a better position to meet life's problems. Many will become professional musicians, inspired not to be devoid of a perspective in life, inspired to become cognizant of their attributes and capabilities. I have had the extreme pleasure on many occasions to place men professionally after their release.

Though there are many faults to be found in the men, I quote from the Bible, "To the faults of others, ye who are spiritual, see those faults in the spirit of meekness, lest ye yourself be tempted with the same faults."

It is good to note that music has such a remedial effect on maladjusted lives, but it is sad to think that these men have gone this far without having had this cultural experience. Perhaps if they had been given an opportunity to feel the satisfying power of music when younger, they would

not have wandered so far from the right way of living. Music, by playing on their emotions, would have softened their outlook and have given them finer ideals, thoughts--would have lifted them up spiritually. By educating their minds to better thinking, they would have cultivated and acquired better tastes.

In the study of mental deficient and their classification it is only fitting that something about learning, thinking etc., be said. How do our emotions effect our learning? What is learning?

John Frederick Dashiell has this to say of learning. <sup>1</sup>

"the original nature of man is not simply his equipment of particular reflexes but also some little inborn patterning of them. In the remaking of an individual we have the acquired patterning of reflexes--habitual behavior. "Habits," let it be borne in mind throughout our study, is a broad name to cover many species and varieties of behavior. In common speech it is used with primary reference to explicit or overt learned performances. Of such speaking, singing, manners of eating, listening to music, and so through a list almost interminable. The more technical uses of the word apply it also to implicit forms of learned performances. There are the various employments of silent speech in "mental" arithmetic, reading to one's self, telling one's self what one does not care to speak aloud. We have already had occasion to note the forming of habitual lines of emotional reaction: a child's fear of "bugs" or of the dark, one man's love for his work, another's extreme self-esteem, still another's super-patriotism, and the whole range of organized sentiments in behavior. Again, we have noted the organizing of habitual ways of attending; how one man notices the street car advertisements while the other studies his fellow-man; how a husband may appraise analytic-

1. Dashiell, John Frederick - Fundamentals of Objective Psychology Chap. 12, pp. 325-385

ally the wines served at a dinner while his wife makes appraisals equally critical of the gowns worn by guests. Habits, then, are of all sorts, from movements observable in a person two city blocks away to those hidden-away, private activities that may go on without detection by the keenest eye."

Learning, we see is a matter of habit-building. By bringing the child regularly in contact with music he will form an emotional habit for better things in life. Through building better emotional habits his learning is enriched and his thoughts have been averted from those of a lower level to a much higher realm. But these good habits must be formed while the child is young if he is to receive any great benefit from them.

Learning has been said to be divided into four parts. These are what may be termed as stages in the history of building a learned habit.

"It is obvious that when any reaction is treated of as learned, it must have been first learned or acquired at some past time, recent or remote, and that it does or can function again at a later time. It has been acquired and can be recalled. But what of the meantime. Many hours, days, or years may elapse between the earlier occasion, when the reaction was first aroused and fixated, and the later date when it is rearoused. Clearly, the reaction as a reaction-possibility has somehow been retained through the interval. It has been potentially there. Finally, at the moment of its later recall the reaction may be rearoused faithfully enough in itself, but it may appear in a novel instead of in its usual motor setting; so that the question arises as to whether it is correctly recognized. There are, then, four stages in learning: Acquiring, Retaining, Recalling, Recognizing."

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1. Dashiell, John Frederick - Fundamentals of Objective Psychology, pp. 325-385

By bringing the child into contact with music we have undoubtedly started building up an emotional habit that if repeated he may Acquire and perhaps Retain a small portion of its educational value and when some one other experience forces him to Recall he will Recognize a similarity and will have learned to love the beautiful things of life. By a variation of such experiences we have given to this person culture. In some of the cases quoted from Dr. Wallin it was quite noticeable the manner in which music affected the child. Most of these mentally deficient cases could sing, hum, or even play music they had heard and liked, yet they could not get their other subjects. Music evidently, then, by appealing to our emotions, must get beyond any obstruction to our mind and benefit us in some manner that no other subject could. In Acquiring there are several principles<sup>1</sup> involved--one of these is variation.

"From our analysis of the learning of a habit it is evident that, in order to learn, one is dependent upon a stock of varied activities. There must be raw material on hand from which to obtain the necessary elements. This is abundantly shown in infant play. The babblings, cooings, gurglings, clinks, grunts, are the varied audible stuffs out of which speech is to be eventually fabricated. The wavings of arms and legs, the meaningless flexing and relaxing of fingers and toes, the twistings of head and trunk, the undirected excursions of the eyes, are but some of the raw material to be made up into manual, pedal, visual, vocal, and general bodily habits.

This random activity, of course, is not completely random; it is not a matter of pure chance,

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1. Dashiell, John Frederick - Fundamentals of Objective Psychology, pp. 325-385

but is a function of the specific organism and its reaction possibilities....

The same general point, that only where there is varied activity can there be learning, is evident at another level. What is an "old fogey" but a man who has been making the same kinds of reactions--including the same emotional reactions--for so long that new ways of verbal and visceral behavior are for him all but impossible. Because of his following too narrow a regime, his habits have become so single-tracked, that little variation in activity is possible to him now...."

Another part of Acquiring is Selection and Fixation. <sup>1</sup>

"In our analysis of learning it was said that the adaptive R's tend to be repeated and in time fixated and the others to be omitted and eliminated. Such a statement is only generally descriptive. Why is such the case: what casual factors operate to produce such selective results? It has been said that "learning is connecting." Why are some connections readily selected and promptly fixated instead of others? What is it about the nature of the connection, or about the accompanying organic or environmental conditions, that determines this phenomenon?

Frequency. Other things being equal, the S-R connection or series of connections most frequently exercised is the one most apt to be operative later....

Of the various faces seen in pictures or in life the child or man is most likely to react with recognition to the one he has seen oftenest.

Recency. Other things being equal, the most recent connection made is the one most apt to be rearoused later....

The student does special reviewing just before his examination. The lawyer concentrates on his brief just before his case is to be called. One can repeat in full a conversation of yesterday whereas one of a year ago is repeated only by snatches or not at all. A pianist who is asked to play a certain composition may protest that it has been too long since he last played it. The physiological explanation for this is probably to be sought in

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1. Dashiell, John Frederick - Fundamentals of Objective Psychology, pp. 325-385

terms of the waning with time of the threshold-lowering effect produced at synapses by the former passage of neutral impulses. Or, to put it differently--the heightened excitability of a sensori-motor arc that has just been used decreases with time.

Primacy. Other things being equal, the first connection made is most likely to be operative later. Experimentation has demonstrated in some cases, at least, the influences of Primacy and also of Recency operating independently of each other and apparently of any other factors....In the loss of remembering power with advancing age, one symptom is a greater ability to recall and to detail those events of "far away and long ago" than those of later years; but we may suspect the phenomenon of "interference of habits" here, the forming of the initial connection interfering with the forming of later ones. Then there is the observation that one is often able to give a better account of the happenings connected with his first day in the new business office, his first medical case, his first ocean voyage, than of those connected with later similar occasions; but here doubtless Intensity is a heavy contributing factor.

Intensity. Other influences being equal, the connection formed with the greatest intensity is the most likely to be re-aroused in a later situation....

Every teacher knows that a pupil's overt and implicit reactions that are made attentively have a greater recall value than those performed in a perfunctory manner. To this end the teacher may adopt various devices for enhancing the stimuli: raising the voice, lowering it, using diagrams, using red chalk, and so on. The learner on his own part may employ various ways of intensifying the stimulation, such as taking a concentrated motor attitude toward the lecture, book, or experiment. Emotionalizing the reaction to a stimulus seems likewise in most instances to improve its readiness on later recall; and a sub-law might not be out of place: "that connection formed with more emotional reinforcement is more likely to be arousable later."....



The term "intensity," however, definite and simple though it usually is, is employed here in a way not at all definite upon analysis in physiological terms. In such illustrations as those given, have we to deal with a mere difference in intensity of some elements of the whole S-R phenomenon--in the objective strength of the stimulus, let us say, in the energy of the neutral transmission, or in the energy of the motor (overt or implicit) reaction? Would it not come nearer the truth to speak of the extensity of the S-R called into operation? "That connection formed with the greatest amount of cooperation and reenforcement from the subject's other motor mechanisms is the most likely to be operative later." "Intensity" seems reducible, then, in part to attitude--especially attentive and emotional attitudes. Since, however, the net result is an increase in the effectiveness of the given stimulus in provoking its response, it will do for rough description to adhere to the usual term, Intensity.

Effect. Of all the conditions responsible for the selecting and fixating of one rather than others of several random S-R connections, the most notable is known as the Law of Effect. Rewards and punishments have had their efficacy and have been deliberately applied by man to man from the beginning of recorded history and even before. The one, when attached to a given line of action (a given S-R process), leads the subject to repeat the act; the other leads him to omit it. The whole structure of organized social control is founded in the last analysis upon the ability so to direct the conduct and the resulting habits of individuals. The effectiveness of these factors in the control of what a person learns to do from infancy up is of universally evident as to call for little special illustrating here....A good deal of this, in fact the greater part, is not socially administered but is "bumped into," is encountered by the individual human subject in the course of his palpings, handlings, climbings, tastings, seeings, and tryings of all sorts. As a general principle of observation there is no denying the Law of Effect."

Another principle involved in Acquiring is Integration. <sup>1</sup>

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1. Dashiell, John Frederick - Fundamentals of Objective Psychology, pp. 325-385

"So far we have been occupied with the acquiring of particular reactions. But learning is not simply the developing of this, that, and another disjointed finger-, tongue-, arm-, and eye-movement; it is a process consisting of the building-up of patterns of response.

A simple type of pattern is involved in the "serial habit." The various responses to be learned as a series at first require successive stimulation of exteroceptive end-organs. Then, as the exteroceptive stimulation of each succeeding reaction is accompanied by the proprioceptive afferent impulses arising from the preceding reaction, the latter by conditioning may become the potent stimuli; and once the initial exteroceptive cue is given, the series rattles itself all under proprioceptive guidance entirely. Only the starting signal is necessary. The part-reactions have become short-circuited. Thus, when a boy is training himself to say, "Lives of great men all remind us," he must on the first reading see each word and say it as seen; but with a few repetitions of this procedure he will find himself reading "Lives" and then saying the whole line. Of this character are a whole host of human habits; giving the alphabet or the multiplication table, humming or whistling a tune, spelling a word quickly, naming the months, type-writing and telegraphing, running the scales on a musical instrument, buttoning a row of buttons, shifting gears, dancing--in a word, any and every habit in which temporal order and spacing of the individual reactions is essentially involved. These, then, are habits of a higher order; they are higher units."

It has been found that in acquiring we must have a variation in activities or learning will be stopped--or rather retarded. The more frequent an experience is enjoyed the more easily it is acquired. The experience that is more intense and affects us the most emotionally is more easily acquired.

By giving the child music haven't we given him a variation in activities? By letting him experience music

often and feel the intensity of its power, haven't we contributed to his acquiring of a beautiful habit. Undoubtedly then, music is of great value to learning for it can be used in the first stage of learning--Acquiring.

Now that the habit has been Acquired, what about the permanence of it? Is a habit once acquired ever lost?<sup>1</sup>

"Evidences against any such total forgetting seem to come from different sources. The accelerated form of curves for the reacquiring of old habits is in point. Outside the laboratory, too, this is to be seen in the surprisingly short time often taken by an adult to relearn some of his high school or college subjects which he supposed he had entirely lost. A second way in which an apparent forgetting may not be a real and total loss is manifested in the way the training that a person has once had helps almost mysteriously in learning new tasks. The fretful freshman may wonder why he has so many required courses to take in subjects of which he is certain to forget the major part in the course of two or three years. But it is almost a certainty that those thousand-and-one bits of habits once acquired will continue to exert their influence in determining his point of view, his "background," his Anschauung, to a degree distinctly noticeable and important. Indeed, perhaps this is the very essence of culture. Finally, we must not neglect the abnormal cases of unusual recall under special conditions. In the hypnotic stage of sleeping, for instance, old "forgotten" habits have frequently been evoked by the operator. The crystal-gazer may after steady eye-fixation be thrown into a condition in which weak, poorly formed connections are relatively more potent. The anaesthetic hand of an hysterical subject may be able to write down old things once learned but no longer recalled by the less dramatic processes of vocal reactions. So much for evidences on one side of the question: evidences on the other side would, like most forms of negative evidence, be somewhat inconclusive.

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1. Dashiell, John Frederick - Fundamentals of Objective Psychology, pp. 325-385

In view of the fact, however, that it will remain forever impossible to test out a man's ability to recall every little S-R that has been hit upon in his past thirty years, the question may be called "academic" and so dismissed."

From this quotation we find that a habit once acquired will continue to exert influence in determining our views and have some bearing on our background. Again music can claim its place for there is no better habit for purifying our views and making them wholesome; for enriching our background and broadening our esthetic tastes. Even in the cases presented by Dr. Wallin of the imbeciles, most of the lowest were able to recall a piece of music and play, sing, or pick out the record they liked best. These children were able to recall music even when they were unable to read or write or get their other subjects. Then it might be said that music contributes definitely to the stages in learning of Retaining and Recalling.<sup>1</sup>

"Recalling is a Reaction. The measure of retention is recall, and the value of a person's learning inheres in his capacity to set at work again segments of behavior formerly fixed. We are helped by returning to our fundamental formula for psychology: stimulus-leading-to-response. There is no genuine S that does not arouse an R; no R not aroused by an S. If an act of recalling be an act, then, it cannot be an unstimulated response any more than an effect can be uncaused, but it must have its initial excitation in some extra- or intra-organic event or condition. If a person finds himself repeating "Ich weiss nicht was soll es bedeuten," this may be due to his having seen or heard the word "Heine" or even "Heinrich"; or he

1. Dashiell, John Frederick - Fundamentals of Objective Psychology, pp. 325-385

may have heard a snatch of Silcher's music, perhaps only the opening eight or nine notes or only a certain tapped rhythm:...."

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Another stage of Learning is Recognizing.

"The degree to which a particular learned mode of reaction has been retained up to a given time may be tested by the method of recognition. A series of stimuli, (for example, nonsense syllables, digits, geometrical designs, et.) once presented to the subject for memorizing are subsequently presented again in conjunction with other stimuli to see how many of the first series he can identify in the second. That one can recognize many items he has been unable to reproduce by direct recall has long been observed in the laboratory-- and in everyday life. Thousands are the musical airs, the passages of prose or poetry, the names of acquaintances that one can identify promptly as such and such, but few are those that he can repeat without special and elaborate aids. The unhappy public speaker searching for his word would recognize it instantly were some one only to whisper it to him.

Ability to recognize correctly is another aspect of memory that is important from a legal standpoint. The identification of suspects by injured parties or by incidental witnesses is at times taken as sufficient evidence for conviction. The more unfortunate it is, then, that the authorities take too little account of the errors so easily committed. Identification by a witness by indicating whether a single individual or thing presented to him is the one in question is little more than worthless on account of the powerful suggestive effect, and whenever possible he should be called upon to pick out the main object from a group of similar persons or things."

In this study of Learning it has been found that music has a great educational value for it can be Acquired, Retained, Recalled and Recognized. But what of thinking?

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1. Dashiell, John Frederick - Fundamentals of Objective Psychology, pp. 325-385

For ages man has been known for his one ability over his fellow creatures, the ability to think. Just what is man doing when he is thinking? Surely he is doing something. For one thing, when a person is thinking he is making some kind of indirect or mediate reaction upon the object or situation with which he is confronted. <sup>1</sup> If a person is thinking about let us say a beautiful song that has affected him quite emotionally, it is readily seen that this thinking is going on in the place of the music itself that is being thought about. So, the indirect response that is called thinking is a response that may go on when the object of the response is not present. <sup>2</sup>

Thus even very little music given to a child will have some definite bearing on his thinking. The more music given the more enriched will become his thoughts, for...."the person, when alone, by making one response stimulates himself to a further response, which operates as stimulus to a still further one, and so forth." <sup>3</sup> Here is a brief summary of the thinking reactions of a person. <sup>4</sup>

"The thinking reactions of a person are true substitute reactions which may be contrasted with the various sorts of reactions we have studied in earlier chapters in that they are more indirect and largely implicit. Learned first in social situations

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1. Dashiell, John Frederick--Fundamentals of Objective Psychology, pp510

2. Ibid

3. Ibid pp. 526

4. Ibid pp. 547

as a form of interstimulation, they come to be abbreviated to the point where they serve as self-stimulations within one and the same organism. Typically these reactions are aroused in the process of an organism's trial-and-error seeking of a way out of a difficulty. Some character of the situation sets off a pattern of implicit reactions, especially symbolic ones, which in turn serve as cue-stimuli to further implicit reactions, and the self-stimulation processes continue until--by virtue of prepotency, lack of inhibiting reaction--tendencies, or the like--one pattern of reactions has undisputed right of way, and the organism overtly behaves accordingly.

Visceral activities furnish the background and much of the continuity of thinking, but the thinking acts themselves are the functions of striped muscles, as is especially well shown in the symbolic reactions of the very labile vocal apparatus."

Perhaps at this point something should be said about  
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 our emotions.

"A person under the influence of strong emotion tends to behave violently and in a manner which seems to show clearly to the on-lookers that his body is, to some extent, like a machine out of control. While he behaves violently, such a man is unable to think clearly. This loss of clearness in thinking may even make his behavior less effective than it would have been if he were not under the influence of strong emotion. A boxer does not box best when he is angry. A really angry man may be less capable of making effective, stinging remarks to his opponent than if he had controlled his anger. Although fear makes it possible for one to run faster and harder than would have been possible in a normal condition, the uncontrolled and unreasoning way in which the frightened person runs may actually prevent his escape from danger.

The behavior which results from strong emotion shows, then, a somewhat mechanical character. The man who is very much angry or

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1. Wallin, J. E. Wallace The Education of Handicapped Children, pp. 17-19

afraid is rather like a motor-car over which the driver has no control. The emotions are, in fact, due to a very mechanical part of our nervous system. They are results of the activity of the brain, which is the part of our nervous system that thinks and reflects and controls. They are not even started by the part of the nervous system to which the brain belongs. Emotions result from the action of a very primitive part of our nervous system called the autonomic nervous system. This is the system of which the solar plexus is a part and which works in cooperation with certain of the glands, such as the thyroid gland.

It is because of this mechanical nature of the emotions that systems of mental culture have always had as part of their aim the control of emotions. Plato and Buddha, the Stoics and the exponents of New Thought, are all alike in trying to teach people ways of subjugating their emotions, although they have wanted to destroy the emotions altogether."

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Here is Seguin's method.

"Seguin's "physiological education," contained in his great book on The Moral Treatment, Hygiene, and Education of Idiots and Other Backward Children, published in 1846 ("the Magna Charta of the emancipation of the imbecile class," which was crowned by the French Academy and commended in an autographed letter by Pope Pius IX for the service of its author had rendered humanity), is essentially a system of sensori-motor training designed to develop imperfect sense organs both as "faculties and functions," and to refine discriminative sensitivity, which is supplemented by literary, intellectual, moral and industrial training. Seguin proposed to develop the "imperfect sense-organs" of the defectives by exercising them. He aimed "to lead the child from the education of the muscular system to that of the nervous system and the senses," and "from the education of the senses to general notions to abstract thought, from abstract thought to morality." The child, he said, should be trained to move and feel (the training of motility and sensibility),



as well as to cognize and moralize. Although employing specially devised didactic apparatus for the formal training of the senses and muscles, each set more or less in isolation, Seguin's view probably was that the sensori-motor and intellectual training should go hand in hand. He asserts that the exercise of a given "function" (probably referring to the physiological activity) should be accompanied by the exercise of the "related faculty" (probably referring to the mental activity), for the "exclusive training of the "function" impairs the "faculty," and "the exclusive training of the faculty atrophies the function." The "function of the senses" evolves into and eventuates in "intellectual faculty." The "sensations" become "idealized" by the process of comparison (the "principle of contrast"), which seems to be Seguin's fundamental teaching principle. Moreover, Seguin emphasized that as soon as slight use had been developed in a function it should be elevated to a "capacity", and applied to some useful purpose. He emphasized that the teacher must fail in her function if she does not get beyond the didactic material and formal processes of training and call to the soul of the child. The work of the true teachers of mental defectives, as he conceived, must become a mission, a consecration, a noble passion for the service of one of humanity's most unfortunate classes. It will repay every teacher of mental defectives thoroughly to familiarize herself with Seguin's method by a careful perusal of his *Idiocy: and its Treatment by the Physiological Method*, published by Teachers College, Columbia University.

After establishing the first successful school expressly instituted for the training of the feeble-minded in Paris in 1837, and directing the reestablished school at the Bicatre (1842) for a year, and a private school for a few years, Seguin, at the time of the Revolution in 1848, emigrated to America, where he assisted in the organization of the first American institution for the feeble-minded. He served for a short time as the superintendent of the "Massachusetts School for Idiotic and Feeble-Minded Youth," at that time located in South Boston, assisted in the organization of the State Institution at Syracuse, New York, and was associated for a while in the direction of the "Pennsylvania Training School for Idiotic and Feeble-Minded Children" in Philadelphia, which is now located at Elwyn. He opened a private

school in New York City in January, 1880, which is now located in Orange, New Jersey. His work became the model and inspiration of the best subsequent educational work and social care of the feeble-minded undertaken in both publicly and privately supported institutions in America.

It is thus apparent that France enjoys the distinction of having originated the modern science of corrective pedagogy. To France we owe the oral method for training the deaf, the embossed type for training the blind to read, the "physiological method" for training the feeble-minded--and more recently the Binet-Simon "method for measuring the development of the intelligence of young children;" which has greatly stimulated the establishment of special classes for subnormals."

Seguin, then, believed that by gaining control of one's emotions you would have the key of direct access to our thoughts and thus in a round about way be able to control our actions. Thus, control of one's emotions aids in shaping his life both mentally and physically.

Here is an argument against the old legend that the musician is peculiar, gullible, temperamental and very much lacking in intelligence.

"Taking Mursell's statement that "the typical musical person has a high grade mentality and shows much versatility particularly in literary and artistic fields" as a starting point, he amasses statistics derived from music and intelligence tests given to 513 sixth grade children, 542 junior high school pupils and 1007 high school boys and girls; figures out correlation coefficients; compares the highest and lowest quartiles ostensibly to prove that "the superior in musicianship are much inferior in intelligence while the inferior in musicianship are just about average in intelligence."

1. Normann, Theodore F. "So Musicians Are Unintelligent" Ed Mus Magazine--18:2 Nov.-Dec. '38 pp.19-20

This is the typical Kwalwasserian argument. Here is the statement of a proposition which by its sheer audacity stimulates interest. Here is the buttressing of a contention by a facile statistical treatment of data. But here, also, is a conclusion drawn from assumptions that no elaborate handling of statistical formulae can very well justify.

Dr. Kwalwasser bases his article on two sets of tests, musical talent and intelligence. What tests he used is not clear for he neglected to mention them in his report.

If Dr. Kwalwasser used his own tests of musical talent, the K. D. tests, his whole argument fails, for he would be using a type of test that has been proved to be questionable both in reliability and validity. Moreover, the procedure suggested by the authors of the K. D. manual of throwing scores for separate tests together and from them obtaining an individual's ranking by a norm is indefensible both statistically and psychologically.

But supposing Kwalwasser used a test other than his own. At present the only prognostic tests of musical talent that have stood up under scientific evaluation by independent research workers are the Seashore tests. But Seashore specifically states that his tests are not designed to be thrown together for a composite picture of musical talent and that any attempt to do so is unsound and illogical. Since Dr. Kwalwasser apparently does this very thing in the statistical treatment of his data, we are left with but one conclusion....his entire argument is based upon a false and unjustifiable assumption.

A second difficulty in which Dr. Kwalwasser finds himself results from a confusion of terminology. He uses tests of musical talent to determine musicianship. The two are not congruous. Musical talent is concerned only with innate, untrained aptitudes. Musicianship, according to Webster's Standard Unabridged Dictionary means "mastery of music." Musicianship, in other words, has a fundamentally different concept from aptitude for music. One learns in grade school arithmetic that one does not add onions and apples. Such confusion of terms is understandable, perhaps, in an elementary school

theme. It can scarcely be justified in the work of one who claims to be a skilled research expert.

Perhaps to lend authority to his argument Dr. Kwalwasser quotes Francis Galton's "Natural Inheritance" to the effect that the height of sons in comparison with the stature of their midparents do not agree, "for sons do not resemble their midparents on the average." From this he assumes that, "Francis Galton's conclusions of fifty years ago can be accepted with little modification for they apply not only to man's height but to music and its relation to intelligence." His syllogism, transposed for the sake of clarity comes to this: Apples grow, man grows; since apples grow on trees, ergo, man must grow on trees.

So many of the studies in music purporting to be research have been subjected to the same pseudo-scientific treatment characteristic of this study that it seems not inappropriate to call attention to the following pertinent observation made by Carl Golzinger in his book "Statistical Methods for Students of Education": "It frequently happens that the worker loses sight of the fact that his data are inadequate as to quantity and quality and applies elaborate statistical methods with the expectation that the final results will be of value. Such procedure, if followed intentionally, has been rightly described as "hiding behind a statistical smoke screen" and is nothing less than a scientific crime. The limitations of the data employed should always be frankly recognized and the conclusions of the study made with them in mind. No amount of subsequent juggling by complicated formulas can give good results when they are based upon originally faulty data.

From the standpoint of proving that there is a definite relationship such as Dr. Kwalwasser maintains between musicianship and intelligence we have got nowhere..the argument is based on faulty and unwarranted assumptions. However, one point seems to be clearly revealed; in the research studies brought out from year to year the teacher of music will be more and more thrust into the position where he must distinguish the wheat from the chaff and regardless of whether he is conversant with standard deviations, normal probability curves or regression equations he

can still use normal intelligence to study the implications of the research work that is being done in his field. He may not understand what is meant by biserial or the Chi-square test, but a careful analysis of the studies that are being reported will give him an ever-increasing power of discernment of the fundamental principles underlying good research technic."

In summing up this study we find that music has been proven to be of great educational value to all types of children--especially more beneficial to the mentally deficient. We find that there is a definite correlation between music and every subject in the curriculum. That music probably contributes more to the mental or learning power of the child than his other studies. Music can find a way to help us both educationally and spiritually where all else might fail. The teacher cannot depend too much upon the validity of tests. She must use her general knowledge of each particular case. Since music has such powers in dealing with mental cases, it is wrong to keep a child from studying music because he has a low I. Q. ranking. The I. Q. rank of a child has no bearing on the musical study of a child. Music, by appealing to our emotions and being allowed to form an emotional habit can influence our thinking and control our actions, deeds etc.,. Music, by forming a habit has contributed to learning. We have found that no matter how low mentally the child may be; if given a musical stimulus he will respond. Then anything as universal as music must be of benefit and a blessing. Not only to the normal child but to the unfortunate mental deficient.

In this study we have tried to find the effect of music on the handicapped child. Psychologists have shown that the one thing wrong with the handicapped child is the instability of his emotions. Since music has been shown to affect our emotions and to have a soothing or healing quality then music is the one subject that this type of child needs. By giving a child an intelligence test we determine whether or not he is unbalanced mentally, physically, emotionally etc. If he is found to be a handicapped child then we know that music is the subject that will benefit him most.

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