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June 1941

I hereby recommend that the thesis prepared under my supervision by CORWIN H. TAYLOR

entitled The Construction and Validation of Certain Experimental Measures of Musical Potentiality

be accepted as fulfilling this part of the requirements for the degree of DOCTOR OF EDUCATION

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Form 668—G. S. and Ed.—1M—7-37

THE CONSTRUCTION AND VALIDATION OF CERTAIN EXPERIMENTAL MEASURES OF MUSICAL POTENTIALITY

A dissertation submitted to

The Graduate Faculty of the Teachers College
of the University of Cincinnati

in partial fulfillment of the
requirements for the degree of

DOCTOR OF EDUCATION

1941

by

Corwin H. Taylor
B. S. University of Cincinnati 1932
M. Ed. University of Cincinnati 1935

ACKNOWLEDGMENT

The writer is deeply indebted to Dr. Gordon Hendrickson, chairman of his dissertation committee, for discerning criticism, inflexible insistence upon high standards, and a generous personal interest; to Dean L. A. Pechstein for wise counsel in shaping the general form of the study; to Dr. Gerald V. Lannholm, the third member of his committee, for judicious guidance in statistical technique; to Mr. J. H. Thuman, Director of the College of Music of Cincinnati, for sympathetic cooperation and assistance; to those students of the College of Music, who will forever remain anonymous, whose performances were recorded; to those schools and colleges, together with their administrations, listed in the Appendix, who participated in the project; to those members of the Cincinnati Symphony Orchestra, the College of Music faculty, and members of other college faculties, all listed in the Appendix, who made up the criterion group; to Mr. Arthur J. Havlovic for painstaking recording; to Dr. Edward A. Henry, Director of the University Libraries, for the conclusion of certain arrangements with the Library of Congress; to Mr. Charles W. Medert for intelligent and accurate copying of scores; to Miss Charlotte Shockley for certain translations; and to the Misses Aurelia Girton and Harriett Wetzel for efficient clerical assistance.

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CHAPTER I

INTRODUCTION

The Problem.- The problem of the present study is to develop, on the basis of aesthetic theory, a battery of measures of musical potentiality. The study arises out of the fact that earlier attempts at measurement in this field have utilized an acoustic approach, and in general have been directed toward simple rather than complex abilities. The program of the present report involves an analysis of the theoretical foundations for the instruments constructed, an account of the manner of their construction, and the presentation of evidence on the validity and reliability of these instruments.

Derivation of the Problem.- In 1930 the College of Music of Cincinnati embarked upon a five year program of testing, the freshman class of each year being subjected to three standardized batteries of music talent tests, two tests of personality traits, and an intelligence test. In supplement it was felt desirable to devise an experimental battery covering certain phases of musical ability not measured by the standardized tests, and involving an approach differing from the conventional one. This battery, hereinafter referred to as the Measures of Musical Background, performed so well as an instrument of prognosis[1] that it was felt worthy of further de-

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[1] Specific evidence on its value with respect to sight singing and dictation is given by Elizabeth M. Taylor, "A Study of the Relative Values of Certain Tests for Prognosis of Achievement in Sight Singing and Dictation," pp. 21, 24. Unpublished Master's thesis, Teachers College, University of Cincinnati, 1935.

velopment.

Description of the Measures.- The battery embraced three divisions, which were intended to tap tonal, rhythmic, and emotional potentialities respectively,[2] plus a fourth purporting to measure acquaintance with musical literature. In the first division the testee was required to identify the mode (major or minor) of melodies, both accompanied and unaccompanied, and of chords. In the second division he was asked to tell the number of beats in a measure in certain musical selections. In the third he was told to choose, from descriptions offered, the one best fitting the mood of certain selections. This first version of the test was played on the piano.

Procedure.- This battery was revised, enlarged, recorded, and standardized in a manner subsequently to be described. Intended in its first form for college freshmen entering the music field, it was expanded into two forms, the first (Form A) for use in the tenth grade and above, the second (Form B) for use in the ninth grade through the fourth. In Form A a second section was added to the original test measuring rhythmic discrimination, in which the testee was asked to determine the constancy of the tempo in certain selections. In the present report all reference is to the revised, enlarged, recorded battery.

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[2] This division of basic processes received authoritative corroboration seven years later. Cf. James L. Mursell, The Psychology of Music, p. 323. New York: W. W. Norton and Co., 1937.

Value.- The possible merits of the study are implicit in the statement of the problem; it presents not only a practical approach to the measurement of musical potentiality, but substantial verification of certain phases of psychological theory heretofore considered debatable. The precise nature of these theoretical questions requires thorough consideration, and Chapter II is devoted to that purpose. A most pressing practical justification for giving attention to talent testing is noted by Burns:[3]

> The young person considering music as his life's work will be spared the waste of time, money, and effort and ultimate defeat if he can know in advance whether or not he possesses the basic abilities necessary for success in the field of music. Music education is expensive education.

Summary.- Certain experimental measures of musical potentiality have been constructed and validated on the basis of some previously devised at the College of Music of Cincinnati, these being known as Measures of Musical Background. These measures test tonal, rhythmic, and emotional factors, and acquaintance with musical literature, and have been recorded and standardized. They are based upon certain theoretical assumptions which will now be examined.

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3 Samuel T. Burns, "Measurement in Music," Bulletin of the School of Education, Indiana University, XV, No. 4, p. 9. Bloomington, Ind.: Bureau of Co-operative Research, Indiana University, 1939.

CHAPTER II

THEORETICAL FOUNDATIONS

The present chapter falls into four divisions, appropriately subtitled. The possibilities of measurement in the field of aesthetics and the various approaches to this problem are considered specifically with reference to music. Outlines for the theory underlying the experimental measures listed in Chapter I are drawn, and the relevance of the tests to this theory indicated.

Aesthetics in Relation to Measurement

The Aesthetic Attitude.- Aesthetics is conventionally defined as the philosophy of art, though the field of aesthetics has lately been declared to be the surface of the experienced world.[1] In any case, the aesthetic attitude presupposes the appreciation of quality, and is centered on a pattern of organized perception. We do not enjoy an isolated sensation, except as the result of artificial training. A single quality may be the center of our attention, but simple perception is always the selection and organization of sensation. Neither is perception passive: we see what we want to see, that which pleases us, and we disagree as to the beauty of an object because we do not see the same object.

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[1] D. W. Prall, Aesthetic Analysis, p. 5. New York: Thomas Y. Crowell Co., 1936.

Distinction may be made between the constructive attitude and the aesthetic attitude. The first contains the practical attitude, which uses the sensory world as a means to some ulterior end; the scientific attitude, which looks for patterns not given on the surface; and the artistic attitude, which recombines, but does not destroy sensory data. This constructive attitude goes beyond the surface of the world; the aesthetic attitude is content with the sensory surface.[2]

The origin of aesthetic feeling lies in central relations, the relations between sensation and judgment.[3] Beauty is not the quality of an object or of the mind, but a judgment passed on experience, a relation between the object and the past experience of the individual.[4] Aesthetic attitude and judgment, however, presuppose a degree of civilization, a course of historical development; they are not necessarily a part of our native equipment.

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2 The writer is indebted to Dr. Andrew Paul Ushenko, Assistant Professor of Philosophy at Princeton University, for these distinctions.

3 Oswald Külpe, Outlines of Psychology, pp. 251-52. Translated by E. B. Titchener, New York: The Macmillan Co., 1901.

4 John H. Mueller, "Theories of Aesthetic Appreciation," Studies in Appreciation of Art, Part I, pp. 30-31. University of Oregon Studies in College Teaching, I, Bulletin 3, (February, 1934). Also Lascelles Abercrombie, Essay toward a Theory of Art, p. 50. London: M. Secker, 1926.

There is no necessity for an exhaustive review of the theories of beauty here. A recent text lists some twelve general categories.[5] Bosanquet[6] has suggested as a comprehensive definition of the beautiful "that which has characteristic or individual expressiveness for sense perception, subject to the conditions of general or abstract expressiveness in the same medium." The fundamental theory of beauty among the ancients dealt with rhythm, symmetry, and harmony; among the moderns ideas of significance and expressiveness prevail. Mueller[7] has proposed a three-fold division of aesthetic theory: the metaphysico-romantic approach based upon the theory of a dualistic universe; the scientific approach, growing out of evolutionary philosophy; and the experimental approach, founded on formal tests for the establishment of norms.

Art and Science.- All this may quite naturally lead to speculation concerning the possibility of subjecting aesthetic data to scientific techniques. Art has been treated as a mode of knowledge superior to science, owing to the sense of increased understanding

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5 A Modern Book of Esthetics, Melvin M. Rader. New York: Henry Holt and Co., 1935. Pp. xxxv + 504.

6 Bernard Bosanquet, A History of Aesthetic, pp. 4-5. London: George Allen and Unwin, Ltd., 1917.

7 John H. Mueller, op. cit., pp. 10-21.

following upon aesthetic experience.[8] Rader[9] quotes Konrad Lange as holding that aesthetic phenomena comprise a "make-believe" world; DeWitt Parker as seeing them as existing midway between belief and unbelief; Bergson and Croce as holding art to be a vision of what is unique, science a summary of what is general; Munsterberg as seeing art as a revelation of the immediate qualities of experience, science as a search for cause and effect. Rader concludes that the substance of art is value, rather than fact or law, and that art will express the values of science, just as science will record the facts of art. Dewey,[10] however, sees both artists and scientists as experimenters, the difference being one of means and materials, and derides the notion that "an artist does not think and a scientific inquirer does nothing else." Youtz likewise believes that:[11]

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8 John Dewey, Art as Experience, pp. 288-89. New York: Minton, Balch and Co., 1934.

9 Melvin M. Rader, op. cit., pp. xxiv-xxvi.

10 John Dewey, op. cit., pp. 15-16, 144.

11 Philip N. Youtz, The Peoples' Institute, New York, in the preface to Thomas Munro's Scientific Method in Aesthetics, pp. ix, xi. New York: W. W. Norton and Co., Inc., 1928.

> . . . art is the human way of creating experience, and science is the human way of understanding it. Between the two there can be no antagonism . . . . the scientist goes directly to art and the experience of art for his data. Aesthetics so far as he is able to contribute to it, is to be applied aesthetics. It is to be based upon experimentation with art; not on speculation, or books, or history, or even on personal emotion.

The Science of Aesthetics.- Can there be a science of aesthetics? The theory of aesthetic pleasure and the investigation of its meaning have commanded a considerable amount of attention from philosophers from Socrates on down. This is science in the sense that we think of ethics as a science, as a "normative" discipline dealing in values. And the tendency of most philosophers has been to fit it as best they can into a preconceived system of metaphysics or ethics.[12] Aesthetics was "cultivated as an austere art of creative reason."[13] It may well be suspected, however, that this dogma that philosophy in general and aesthetics in particular exist for no practical purpose but simply for the sake of knowledge has, in Munro's language, "saved many lofty doctrines the shock of having their emptiness revealed."[14] That such doctrines will not

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12 Edward J. Dent, in the Introduction to William Pole's Philosophy of Music, p. v. New York: Harcourt, Brace and Co., 1924.

13 Philip N. Youtz, op. cit., p. 9.

14 Thomas Munro, Scientific Method in Aesthetics, p. 28. New York: W. W. Norton and Co., Inc., 1928.

sacrifice their loftiness willingly is found in Grudin's accusation that investigators are failing to discriminate among psychological, physiological, and physical data, and are departing thereby from pure philosophy.[15] In defining aesthetics as it is here defined, though, a purely logical approach becomes inadequate. Bosanquet aptly summarizes this viewpoint when he states that:[16]

> . . . finally, it may be laid down that idealism without detail is idle speculation; and formal or exact aesthetic, in its various shapes as the observation of universally beautiful structure, as its analysis into abstract relations, and as the causal explanation of their agreeableness in terms of the psychical movement, is an indispensable instrument in the hands of idealism. . . . And moreover we shall find that in the employment of such analysis . . the interpreter who is on the alert for refinements of import -- that is, the idealist with a grasp of reality -- will distance all competitors.

The idea of "exact" aesthetic first found definite expression in the works of the Germans Fechner and Stumpf. One writer[17] traces it back through Schopenhauer and Kant to Plato and the Idea. Thus broadened, Herbart and Zimmerman may be included. Fechner's original work attempted to test the agreeableness of isolated forms

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15 Louis Grudin, A Primer of Aesthetics, pp. 246-47. New York: Covici, Friede: Publishers, 1930.

16 Bernard Bosanquet, op. cit., p. 392.

17 Elsie Murray, "Some Uses and Misuses of the Term 'Aesthetic,'" American Journal of Psychology, XLII (October, 1930), 640-44.

to unbiassed taste.[18] He experimented with colors and with geometric figures, finding that slight but definite reason exists for displayed preference between certain figures. It was held that the paucity of content symbolized by such bare forms was easily overcome by concrete application of the forms. Fechner's aesthetic laws closely resemble those of the Greeks: unity in variety, clarity, congruousness. He is most remarkable, however, for his technique, which involved an approach to aesthetics "from beneath" -- the plodding methodology of psycho-physical study -- in distinction from the purely logical approach "from above".

When Gustav Fechner sought to lay down the laws of beauty by measuring cards, books, windows and many other objects of daily use he founded an approach to his problem that was to lead to some very fruitful and surprising developments. The laboratories of German analytic psychology readily took up the cause, nurtured it, and in late years re-christened it Kunstwissenschaft.[19] As late as 1910 a study titled, "Aesthetic Unity, An Investigation into the

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[18] Vorschule der Aesthetik. Leipzig: Breitkopf und Hartel, 1892. Pp. viii + 319. (First edition 1876).

[19] Literally, "art-ology": science of art.

Conditions that Favor the Apperception of a Manifold as a Unit," came out of Harvard University.[20] Still more recently the same institution has given us a reincarnation of the same attack carried to its logical development in Birkhoff's Aesthetic Measure.[21]

Aesthetic Measure.- Birkhoff defines the fundamental problem of aesthetics as the determination of the specific attributes upon which aesthetic value depends. This value is intuited, and is clearly separable from sensuous, emotional, moral, or intellectual feeling. Three successive phases are regarded as comprising the aesthetic experience: the effort of attention, which is preliminary and necessary for perception, and which grows in ratio to the complexity (C) of the object; the feeling of value, or aesthetic measure (M) which follows this attentive effort; the realization of the order (O) in the object requisite to its aesthetic effect. M, O, and C are regarded as measurable variables, and the problem is stated mathematically as $M = O/C$: "Aesthetic measure is determined by the density of order relations in the aesthetic object."

Birkhoff admits that his formula takes account of formal elements of order and ignores connotative ones. (Formal elements are

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20 Margaret Otis; not published until 1918. American Journal of Psychology, XXIX (July, 1918), 291-315.

21 Aesthetic Measure, George D. Birkhoff. Cambridge, Mass.: Harvard University Press, 1933. Pp. xiv + 226.

those arising from physical properties, such as symmetry or consonance; connotative ones are those of meaning or expression.) Connotative elements, he states, are "of inconceivable variety and lie beyond the range of precise analysis."[22] And, in defense of his position, "It seems almost obvious that aesthetics, if it is to be scientific, must be approached from the analytic point of view and must concern itself chiefly with the formal aspects of art."[23] It is not surprising that his most convincing work has been done with polygons, nor that his analyses of diatonic harmony and melody substantiate the rules of classical harmony.

Like all such efforts that approach the measurement of aesthetic reaction or capacity through the physics of formalism, it is foredoomed to failure by its self-imposed limitation. As Pope[24] has indicated, Birkhoff's formula is based upon the assumption that all factors are constant, and may be considered in a rational way. Ogden,[25] too, touches the crux of the matter when he points out that,

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22 Ibid., p. 13.

23 Ibid., p. 191.

24 Arthur Pope, "A Quantitative Theory of Aesthetic Value," Art Studies: Medieval, Renaissance, and Modern, III, 1925, p. 133.

25 Robert Morris Ogden, The Psychology of Art, pp. 20-21. New York: Charles Scribner's Sons, 1938.

while a work of art can be rationalized and its special pattern defined, we cannot measure its effect in terms of constant elements. Prall sums up succinctly with the comment that:[26]

> . . . whatever his formula may measure, it is not degrees of beauty, since if the degree of beauty varies directly with the orderliness of the figure, and inversely with its complexity, a maximum would be reached when the 'order' became infinite or perfect, and the complexity vanished. But . . this would be to reduce the structural form itself to the perfectly transparent, to that which we grasp without conscious attention and so without appreciable aesthetic content.

Measurement in Music

In turning to the central interest of this study it is immediately noticeable that the major part of measurement for capacity in music has been carried on for purposes of prediction. For the most part, aesthetic potentiality in this area has been broken down into several categories. A number of obvious difficulties at once present themselves. Whereas investigators such as Birkhoff work with relatively static material -- works of art -- the measurement of the capacity to <u>produce</u> or <u>interpret</u> works of art introduces the variable of human behavior. The problem is one step further removed in point of accessibility, though its fundamental questions are not dissimilar. Washburn shows some appreciation of this when she writes:[27]

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[26] D. W. Prall, <u>op. cit.</u>, p. 87.

[27] Margaret Floy Washburn, "The Psychology of Esthetic Experience in Music," <u>Addresses and Proceedings, National Education Association of the United States</u>, LIV, 1916, pp. 600-08.

It is only a moderate statement of the difficulties involved in the psychology of music to say that the problem of human enjoyment is one of the most puzzling that psychology encounters; the problem of esthetic enjoyment is harder than that of any other form of enjoyment, and musical enjoyment is apparently the most mysterious form of esthetic enjoyment.

By and large, most efforts at measurements in this area have been based on theory which might have been inherited from Fechner, and have fallen into the expected errors and limitations through an excessive zeal to be "quantitative". There have been notable exceptions. The Max Schoen Tests of Musical Feeling and Understanding[28] employ an objective technique and yet do not confine themselves to sensory data. Bernfeld[29] has made an interesting application of psycho-analytic technique in attempting to explain the absence of aesthetic capacity. Hevner has carried out a comprehensive program that is delimited to the field of appreciation, but yet shows a grasp of the breadth of the problem.[30] But the quantitative approach may be examined.

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28 Max Schoen, "Tests of Musical Feeling and Understanding," Journal of Comparative Psychology, V (February, 1925), 31-52. Also see Max Schoen, "The Validity of Tests of Musical Talent", Journal of Comparative Psychology, III (April, 1923), pp. 101-21.

29 Siegfried Bernfeld, "Zur Psychologie der Unmusikalischer," Archiv fur die gesamte Psychologie, XXXIV (September 28, 1915), pp. 235-53.

30 Kate Hevner, "Appreciation of Music and Tests for the Appreciation of Music," Studies in Appreciation of Art, Part IV. University of Oregon Studies in College Teaching, I, Bulletin 3, (February, 1934), pp. 83-150.

The Seashore Theory.- Seashore[31] proposes a "rigid and verifiable base" from which all measurement in the aesthetics of music may begin, on the assumption that "beauty in music consists in artistic deviation from the regular, the rigid, or the fixed in each attribute of sound . . . Everything that is conveyed from singer or player to listener as music is conveyed on the sound wave. The sound wave may be intercepted with the camera, recorded, analyzed, and measured with a high degree of precision". Variables of the sound wave are four: frequency, amplitude, duration, and form. "These are the four and the only 'plastic media' in terms of which beauty or ugliness may be created in music". Further,[32] "everything in the way of musical expression that the singer conveys to the listener is conveyed in terms of the sound wave". Finally, concerning "Esthetics as a Normative Science" he states:[33]

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31 Carl E. Seashore, "A Base for the Approach to Quantitative Studies in the Aesthetics of Music," American Journal of Psychology, XXXIX (December, 1927), 141.

32 Carl E. Seashore, "Measurements on the Expression of Emotion in Music," Proceedings of the National Academy of Sciences, IX, (1923), 323.

33 Carl E. Seashore, Psychology of Music, pp. 377-82. New York: McGraw-Hill Book Co., 1938.

For the purpose of classification and description, the coming musical esthetics, which is based upon experimental science, may be divided into four aspects, namely, the musical medium, the musical form, the musical message, and the musical response. . . The musical medium is the music proper as executed in the form of physical sounds which have their physiological and mental correlates. Esthetics accepts the scientific approach to the medium as physical, psycho-physical, physiological, and psychological. . . . It begins with the classification of the physical characteristics of the sound wave and carries this classification through the physical sounds, as mediated through the physiological organism, as responded to by the psychological organism in sensory experience, and as reproduced and elaborated in memory, imagination, thought, and emotional drives in their marvelous possibilities of intricate relationships. But let us not delude ourselves into thinking that the situation is simple or solved. . . . The mental process never corresponds exactly to the physical event, and it is in this situation that the real problem of the psychologist begins in the task of discovering law and order in the deviations of the mental event from the physical event . . . . But the composer, the performer, and the listener all deal with the physical medium and all the theories of form and interpretation of message and response must in the long run be grounded upon a true cognizance of the nature of this medium and its possible roles. . . . The musician is primarily concerned with the nature of musical form, the organization of its art principles, its development, and the theory of art objectives. . . . The problem is primarily that of the composer; but the composer, like the architect, is at the mercy of available materials, competent workmanship, and adequate resources of all kinds. . . . The scientist, however, makes his entry into this field by critique of concepts and by reducing aspects of musical form to concrete issues which may be treated exhaustively in the laboratory for verification, criticism, and adaptation, and even for the development of new forms. . . . The musical message is that esthetic experience -- be it feeling, ideation, impulse, craving, wish, or inspiration -- which the composer in the first instance and the interpreter at the next level desire to convey to the audience through the form given by the musical medium. . . . The esthetics of the message, therefore, becomes the psychological analysis, interpretation, and explanation of the musical experience of the sender and the receiver of music, in terms of content. . . . The same line of thought that has been outlined for the message applies, in a general way, to the interpretation of the response.

Concerning the musical mind, Seashore writes:[34]

> The point of view here presented as a result of laboratory experience is based upon the analysis of the musical medium — the physical sound. This rests upon the assumption that a musical mind must be capable of sensing sounds, of imaging these sounds in reproductive and creative imagination, of being aroused by them emotionally, of being capable of sustained thinking in terms of these experiences, and ordinarily, though not necessarily, of giving some form of expression of them in musical performance or in creative music. In this objective approach, we must keep in the foreground the fundamental fact that the musical mind does not consist of its dissected parts, but in an integrated personality. In its evaluation we must always have regard for the total personality as functioning in a total situation. Musical talent is not one, but a hierarchy of talents, branching out along certain trunk lines into the rich arborization, foliage, and fruitage of the tree, which we call the "musical mind". The normal musical mind is first of all a normal mind. What makes it musical is the possession, in some degree, of those capacities which are essential for the hearing, the feeling, the understanding, and, ordinarily, for some form of expression of music.

Analysis is then made of the musical mind into sensory capacities, musical imagery, musical imagination, musical memory, musical intelligence, musical feeling, and musical performance. Considerably more comment is devoted to "quantitative" treatment

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34 Ibid., pp. 1-2.

of sensory capacities than other factors of the musical mind.[35] The psychological attributes of sound -- pitch, loudness, time, and timbre -- correspond to the physical characteristics of the

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35 Ibid., p. 12. Seashore has a trick of specious analogy which is apt to deceive the uncritical. In defense of his analysis of the musical mind he compares botanical classification to physical analysis: "The esthete . . can ignore the atom, but the botanist cannot" (Ibid., p. 11). Similarly, he gives a critic of his tests the odor of quackery in the sentence "Let me designate his theory as the 'omnibus theory' and mine as the 'theory of specifics', somewhat on the analogy of the distinction between cureall and specifics in drugs" (Ibid., p. 383).

With no desire to present an argument ad hominem, any statement of Seashore's position is incomplete without some notice of his attitude toward the whole problem, so remarkably does it color his thinking. At one point, in deriding criticism of his atomistic position, he ridicules "the esthete, whiffing and raving about the beauty of the rose" (Ibid., p. 11). This type of diction is on a level with the political lampooning of "professors in government" who are always in academic garb, weak-chinned, bespectacled. In the preface to his Psychology of Music (p. xi) he describes the change that has come about in his attitude toward music over a fifty year period: "Considering what music meant to me then and what it means to me now after a life career in the science of music, there comes to me an analogy from astronomy. Then I was a stargazer; now I am an astronomer. Then the youth felt the power of music and gave expression to this feeling in the way he loved and wondered at the stars before he had studied astronomy. Now the old man feels the same 'power of music,' but thinks of it in the manner that the astronomer thinks of the starry heavens. . . It is not easy to pass from stargazing to technical astronomy. It is not easy to pass from mere love and practice of music to an intelligent conception of it." All of this carries the impression of a man curiously committed to the belief that an "intelligent conception" of music rests solely upon analytic physics, and curiously proud that he has permitted his artistic feeling to atrophy.

sound wave mentioned above: frequency, amplitude, duration, and form. But there is also an "inner screen" of complex forms, -- the senses of tone quality, consonance, volume, and rhythm, which must be evaluated by themselves, and not by analysis of parts. "For example, rhythm depends upon the sense of time and the sense of intensity, as hydrogen and oxygen combine into water; yet water and rhythm are practical entities in themselves".[35]

The Seashore Tests.- Based on the above theory are Seashore's Measures of Musical Talent, six in number, phonographically recorded.[36] In the Sense of Pitch test the listener is asked to judge whether the second of two tones is higher or lower than the first, there being a hundred of such pairs. In the Sense of Intensity test the same technique is applied to pairs of tones differing in strength, one hundred in number. In the Sense of Time test the listener hears three clicks marking off two intervals of time, and is asked to judge whether the second interval is longer or shorter than the first; one hundred items. In the Sense of Consonance test judgment is required as to the better one of each of fifty pairs of two tone combinations. The Sense of Consonance test was replaced in the recent revision[37]

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[36] The original Measures were recorded on Columbia Records No. A7536, A7537, A7538, A7539, A7540, 53005D. New York: Columbia Graphophone Co., 1919. The revised Measures are recorded on Victor Records 450A to 455B inclusive, and comprise two series. Camden, N.J.: The RCA Victor Co., 1939.

[37] Camden, N. J.: The RCA Victor Co., 1939.

by a test of timbre, after arousing a storm of protest too furious for even the test author to weather. The directions for this Measure of Musical Talent contain the remarkable statement that "This calls for a judgment on blending, smoothness, and fusion, apart from the feeling of like or dislike, and apart from theory or feeling of musical value"[38] (italics by the present writer). In the Tonal Memory test the listener is required to record by number which tone of a series was changed in the second playing; fifty items. In the Sense of Rhythm test judgment is requested on whether the second rhythmic pattern of a pair was the same as or differed from the first; fifty items.

Criticism of the Theory.- Almost eighty years ago, Helmholtz, in discussing the relationship of musical tones, wrote:[39]

> Hence it follows, and the proposition is not even now sufficiently present to the minds of our musical theoreticians and historians -- that the system of Scales, Modes, and Harmonic Tissues does not rest solely upon unalterable natural laws, but is also, at least partly, the result of esthetical principles, which have already changed, and will still further change, with the progressive development of humanity. (Italics by Helmholtz.)

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38 Manual of Instructions and Interpretations for Measures of Musical Talent, C. E. Seashore, p. 14. Iowa City, Ia.: University of Iowa. No publication date; presumably 1919.

39 Hermann L. F. Helmholtz, On the Sensations of Tone, p. 235. Fourth English edition, translated by Alexander J. Ellis. London: Longmans, Green, and Co., 1912. (First German edition 1862).

Pole[40] has emphasized the same point. Prall[41] also mentions the "risk of mistaking a physical account of vibration rates for aesthetics itself". Dewey[42] inveighs against "attempts to carry over alleged scientific findings about sense material into esthetics". Cooke questions the ultimate value of any scientific investigation in the field of art:[43]

> Science may investigate process and causation. She may tell us of the physical properties and beheavior of color and of sound, of its transmission to eye and ear. She may wax enthusiastic over the muscles of the hand, and the mechanism of the pianoforte; expounding the processes of the transmitting wireless station, of ethereal waves, of receiving apparati, of the physiology of the human ear; but when she has done all this, she will have left out the music -- the origin and end of it all.

But what constitutes scientific method in aesthetics? Munro, in speaking of the experimental attitude in science, holds that:[44]

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40 William Pole, The Philosophy of Music, p. 12. New York: Harcourt, Brace, and Co., 1924 (sixth edition).

41 D. W. Prall, op. cit., p. 10.

42 John Dewey, op. cit., p. 121.

43 Greville Cooke, Art and Reality, p. 62. London: Joseph Williams, Ltd., 1929.

44 Thomas Munro, op. cit., pp. 15, 17.

> . . . scientific method is by no means identical with the use of X-rays, color-charts, galvanometers, or any of the other paraphernalia of particular sciences. It is not identical with absolute logical proof, or the working out of a chain of "necessary" inferences, like those of geometry. It is not identical with quantitative measurements. Their utility in most scientific fields is of course undeniable, and the extent to which they are developed is often regarded as the chief criterion of a science's progress. Nevertheless, in dealing with complex and variable phenomena, such as are constantly met with in biology, psychology, and the social sciences, they are often impossible, and investigation must proceed, if at all, in more rough and approximate terms. When erected into a fetish, as they have been by "experimental aesthetics", they usually lead to premature inferences that have a specious air of certainty, and to the neglecting of more fruitful modes of inquiry. . . Another implication of an experimental attitude in aesthetics will be a willingness to make the best of materials at hand, as to both data and hypotheses. Too rigorous an insistence on absolute reliability and "objectivity" of data, too impatient a zeal for universally valid generalizations, may be an obstacle in a field where these cannot be obtained at once, if ever. As far as objectivity is concerned, we are gradually learning that no science, even mathematics, can be too sure of itself. . . effort is devoted now to making generalizations that will work as reliably as possible in predicting and controlling events.

It is evident, then, that science in aesthetics is not necessarily pure descriptive science with its "facts". Fruitful and suggestive as Fechner's work was, its limitations were the result of adherence to the descriptive viewpoint: it was aesthetics "from beneath" with a vengeance. Nahm[45] traces this tradition clear back to Pythagoras. Concerning Fechner, Munro continues:[46]

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[45] Milton C. Nahm, The Aesthetic Response: An Antinomy and Its Resolution, p. 6. Philadelphia: University of Pennsylvania, 1933.

[46] Thomas Munro, op. cit., p. 63.

> The Fechner tradition in aesthetics . . has usually limited itself to observing those features of art and aesthetic experience which can be described with high objective accuracy, such as dimensions and votes of preference. This automatically excludes the facts of greatest concern to artists and critics: the subtle and complex ways in which a work of art affects a sensitive listener. . . Recent attempts to adapt mental tests to the study of aesthetic phenomena have tended to perpetuate the chief fault of the Fechner tradition: its over-emphasis on quantitative measurements.

Hence when Seashore insists that every aesthetic effect in music must be correlated with some variation in the sound wave he is basing his case on an atomistic associationist psychology that stems directly from the Fechner tradition. Mursell[47] touches the core of the matter when he points out that quantitative differentiation in design rests on "factors of organization internal to the psychophysical personality, and only secondarily from the external stimuli". The phenomenon of art cannot be investigated without accounting for these factors, which are over-simplified by associationist psychology. Munro, too, shows that:[48]

> the effect of any percept by itself may be quite different from its effect in a larger form. The effect of two strips of colored paper side by side, or of a simple chord progression is no trustworthy sign of what their effects would be in works of art. Nor can one infer from the physically measured ratios of light-waves and sound-waves exactly what effects of harmony or conflict they will produce; for too many psychic factors complicate the situation.

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47 James L. Mursell, "The Application of Psychology to the Arts," Teachers College Record, XXXVII (January, 1936), 291.

48 Thomas Munro, op. cit., p. 63.

These are serious obstacles to all generalizations, based on physics, about the harmony of colors or of tones. It should also be remembered that laboratory conditions are not apt to be favorable to any full and spontaneous emotional experience. . . The emphasis of the recent Gestalt school on total unified configurations, rather than on isolated factors, is a much more promising approach to aesthetics. In such concepts as "configuration" and "redintegration" we are coming much closer to the apparent nature of a complex aesthetic response to a total form.

In the same vein McCall writes:[49]

Certain more extreme exponents of this organismic view contend that not only any organism is more than the sum of its parts, but also that adding test scores is like trying to make a man by sticking together a head, a trunk, two arms, and two legs. A reading score cannot be properly compared to one leg. It is not a broken off fragment of the mind. In a very real sense, a reading score tends to measure the entire organism functioning in that reading situation.

In this connection it may be noted that Seashore states that the musical mind does not consist of its dissected parts, but in an integrated personality. As will be shown subsequently, his practice does not follow his theory in this regard. And the proposal that aspects of musical form be reduced to concrete issues and treated in the laboratory for the development of new forms is scarcely credible.

Criticism of the Tests.- The present study is concerned with the Seashore tests qua tests; results achieved with them are of secondary interest, and are discussed only insofar as they are pertinent to the theory involved.

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[49] William A. McCall, Measurement, p. 11. New York: The Macmillan Co., 1939.

As Pratt[50] has indicated, if the Seashore Measures had been constructed purely to test the capacities of individuals for the type of sensory discrimination called for, no one would find them objectionable, save in the case of the Sense of Consonance test. The difficulty arises when they are advertised as a reliable index of musical talent. Is musical talent awareness of differences in the sensory areas tested? Is pitch "the essential medium of musical appreciation and expression?"[51] In view of the analysis of musical talent that Seashore himself has published,[52] is he justified in the "uncompromising title" which has caused the tests to be "used as a complete measure of musical talent without protest on the part of the author, and has caused this test series to be quite generally accepted as the measure, instead of a measure, of musical talent?"[53] From these considerations, and on the basis

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50 Carroll C. Pratt, The Meaning of Music, p. 133f. New York: The McGraw-Hill Book Co., Inc., 1931.

51 Carl E. Seashore, The Psychology of Musical Talent, p. 30. New York: Silver, Burdett and Co., 1919.

52 Ibid., pp. 7-8.

53 J. C. Moos, "The Yardstick Applied to Musical Talent," The Musical Quarterly, XVI (April, 1930), 239.

of low reliability and validity coefficients, Pratt[54] concludes that at best the tests may have a negative diagnostic value: high test scores may or may not indicate the presence of musical talent, but low scores probably indicate its absence. Vernon[55] touches on this point indirectly when he comments that "some musical people or good performers do not obtain as high scores as unmusical people". After indicating low validity with various criteria of musicianship, and low statistical reliability, he concludes that "the probable reason for their failure is that the tests deal with auditory rather than with truly musical capacities. Music cannot justifiably be analyzed into such elementary features . . . and to isolate the innate aptitudes from the effects of acquired training is a purely theoretical abstraction".

Probably the most severe strictures levelled at the tests have been those of Mursell. With a vast array of evidence he attacks both the reliability and validity of the Measures,[56] particularly stressing the inadequacy of the Eastman Study.[57] He

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54 Carroll C. Pratt, op. cit., p. 140.

55 Philip E. Vernon, "Tests in Aesthetics", Yearbook of Education, 1935, p. 530. London: Evans Bros., Ltd.

56 James L. Mursell, The Psychology of Music, pp. 289-299. New York: W. W. Norton and Co., Inc., 1937.

57 Measurement of Musical Talent: The Eastman Experiment, Hazel M. Stanton. Iowa City, Ia.: University of Iowa, 1935, Pp. 140.

summarizes:[58]

> The essential point is that the Seashore Measures of Musical Talent undertake merely to test the responsiveness of the ear as a receptor to certain differences in the sound wave. But we have insisted that music depends upon our perception of the dynamic relatedness of tone. Certainly there is nothing in the validation studies which points in the other direction, or forces us to reconsider our view of the nature of musical hearing. If this is the case it is clear why the Seashore Tests are much more efficient in identifying those incapable of musical achievement on a high level than in the positive diagnosis of talent or even in revealing the degree in which it exists. . . To venture a summary statement it would seem that the most reliable of the Seashore Tests measure acoustical rather than musical abilities.

Virtually the same data are offered in substantiation of the claim that music tests in general have "never been proved up", as has, for example, the Terman Group Test of Intelligence.[59] Seashore has defended his thesis[60] in a statement pointing out that his tests are based on a theory of "specifics", and have been validated for what they purport to measure. To validate them against general musical behavior is to subscribe to an "omnibus"

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58 James L. Mursell, op. cit., p. 300.

59 James L. Mursell, "What About Music Tests?" Music Educators Journal, XXIV (October-November, 1937), 16-18.

60 Carl E. Seashore, "Two Types of Attitudes Toward the Evaluation of Musical Talent," Music Educators Journal, XXIV (December, 1937), 25-26.

theory that is "unscientific". Which leads back to the question, if the tests cannot be validated against musical behavior, can it be justly claimed that they measure musical talent? Granted that they measure specific sensory responses, and it appears that they do not do that reliably, can musical talent be measured in terms of "an assembly of atomistic sensory acoustic abilities?"[61] Diserens and Fine[62] believe the method to be highly artificial, and that reactions to such stimuli do not correspond to those in a genuinely musical situation.

> These simple elements are no more music than the letters of the alphabet are literature; than a miscellaneous medley of words are poetry, or an accumulation of building materials is architecture. For this reason, material, for the experimental investigation of musical effects on organisms, should always be organized material; that is, it should always consist of actual musical selections.

Wyatt[63] makes an interesting point in showing that, while Seashore rejects validation of tests by "omnibus situations, diverse and unrelated", he relies on Stanton's data to show that the tests are stable measures of capacities, since, according to Stanton, training does not improve test scores. However, the

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61 Geza Revecz; quoted from James L. Mursell, The Psychology of Music, p. 300. New York: W. W. Norton and Co., Inc., 1937.

62 Charles M. Diserens and Harry Fine, A Psychology of Music, pp. 15-16. Cincinnati: College of Music, 1939.

63 Ruth Wyatt, "A Note on the Use of 'Omnibus' Training to Validate Seashore's 'Capacity' Hypothesis," American Journal of Psychology, LII (October, 1939), 638-640.

"training" with which test scores were compared was vocal and instrumental lessons, chorus and orchestra, and theoretical subjects.

Resume.- In summary, the first difficulty with the Seashore theory is that it explains an expressive medium in terms of its physical cause: Seashore holds, in essence, that there is nothing in music which was not first in the sound wave. Second, since we do not hear the sensation of sound, but mental patterns created by the mind through selection and organization, musical talent implies a sensitivity to values that cannot be measured by a sensory test. Third, if all the sensory elements functioning in music could be abstracted and measured, the sum total would not represent a measurement of musical talent. It is not possible, as Ogden[64] puts it, to "measure the conditions under which a work of art is produced and enjoyed by 'pointer-readings,' . . . there are too many variables. . . The appeal of a work of art is 'synaesthetic.'"

An Alternate Theory

Preliminary Suggestions.- Since "considerations of this kind show us the futility of endeavoring to build up a science of music by an investigation of acoustical laws,"[65] other means must

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[64] Robert Morris Ogden, op. cit., p. 21.

[65] T. H. Yorke Trotter, Music and Mind, p. 236. London: Methuen and Co., Ltd., 1924.

be sought. Mursell[66] has suggested that procedures first be standardized, so as to deal with the same function on the same level, or at least develop "materials which render possible objectively measurable responses whose item difficulty is known". Further, tests must be validated by trying them out on the conspicuously musical and the conspicuously unmusical. Also, workers should "assemble a battery of items which reveal the processes of tonal and rhythmic integration upon which music depends operating in various directions and on various levels". Finally, the most accurate results will probably be achieved on an individual test.

Vernon[67], after indicating the difficulties inherent in strict adherence to either the musical or the scientific attitude, suggests a compromise between the two, pointing to the contemporary approach to mental life and human nature as a whole as a precedent. He insists that the too philosophical and too scientific investigators are working blindly, and that both the experimenter and some of

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66 James L. Mursell, The Psychology of Music, pp. 317-19. New York: W. W. Norton and Co., Inc., 1937.

67 Philip E. Vernon, "Method in Musical Psychology," American Journal of Psychology, XLII (April, 1930), 127-34.

his observers should be drawn from the ranks of well trained and highly discriminating musicians. They are the only people, he contends, who approximate to understanding what they hear and therefore have a right to speak about it; and it is they who must be considered, since they largely determine what music shall last. Finally he suggests that genuine music capable of producing genuine musical experience be used. In a later monograph he embodies the same thought in the sentence "Probably those tests are better whose material consists of actual musical compositions . . than those which use elementary phrases and simple, abstracted designs".[68] Diserens and Fine,[69] it will be recalled, also proposed that test material should consist of actual musical selections. Pratt,[70] too, wonders why it has not "occurred to those interested in the measurement of musical talent to put music itself to the test."

A Proposed Alternative.- The present chapter was introduced with a definition of aesthetics and a description of the aesthetic attitude. Re-examined in the light of the preceding

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68 Philip E. Vernon, "Tests in Aesthetics," Yearbook of Education, 1935, p. 532. London: Evans Bros., Ltd.

69 Charles M. Diserens and Harry Fine, op. cit., loc. cit.

70 Carroll C. Pratt, op. cit., p. 146.

discussion, wherein does the aesthetic attitude, the aesthetic approach, differ from all of the foregoing? It is largely a matter of level. "Aesthetics begins, " says Prall,[71] "where mechanics and physics and biology, economics and politics and ethics, end." The statement that for understanding we must start with elements and natural orders and then proceed to complex combinations is therefore objectionable and untenable from this viewpoint. If aesthetics were analogous to the other sciences, if the data were quantitative in nature, if a work of art were merely a combination of elements, the view stated above would be acceptable. But a work of art is a sophisticated, complicated pattern, and talent for the creation, interpretation, or appreciation of that work of art defies atomistic analysis.

In rejecting the Fechner tradition, the present study commits itself to the type of aesthetic analysis espoused by Prall,[72] an analysis into natural basic orders; not elements of sensation, but orders of perception, orders fundamental to the relations between sensation and judgment. These elements are not

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[71] D. W. Prall, Aesthetic Judgment, p. 3. New York: Thomas Y. Crowell Co., 1929.

[72] D. W. Prall, Aesthetic Analysis, especially Chapter II. New York: Thomas Y. Crowell Co., 1936. Pp. 211.

physical measurements, but qualitative content.[73] Hence the structures natural and basic to the analytic aesthetics of music are the scales: tonality; temporal pattern; rhythm. These are "natural patterns of intrinsically ordered qualitative elements"[74] which acquire relevance through expression. They are "systematically related in ordered ranges or manifolds to which they belong by virtue of their own nature," and "cannot occur except as exhibiting positions or relations in these orders." Determinate composition is possible "only in terms of the abstractly ordered aspects of sensory content."[75] The purpose of this composition is expression, and "its emotional character, its feeling, that is, the way it feels to us, is no less genuinely 'objective' than its colors or its sounds. . . . also no less objective than those units of measurement and those structural relations to which we confine our attention in the natural sciences and their symbolic formulations."[76]

Criticism.- It may be objected that this is but breaking art -- music, specifically -- down into another set of categories, that this type of analysis is just as atomistic as that which it is

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[73] Ibid., p. 43.

[74] Ibid., p. 79.

[75] Ibid., pp. 135-136.

[76] Ibid., pp. 142-143.

intended to replace. The point is that aesthetic analysis is not physical analysis, nor yet psychological analysis. Aesthetic analysis is concerned with the qualitative field as presented, psychological analysis with conditions in response. There may be, and is, correlation, but not duplication. A quality is not identical with its physical or psychological conditions.

It may be further objected that if a work of art is analyzed, the result does not contain something found in the whole: the creation includes something that will not resolve into simple data. A work of art is an emergent whole, and can be explained only in terms of itself. This has already been answered in part in the preceding outline of the distinctions between qualitative and quantitative analysis. It should be added that any process of abstraction omits something. In Prall's words:[77]

> Nothing is the whole truth. . . all knowledge involves abstraction and analysis. . . knowledge varies in relevance with the choice of what is abstracted, in scope with the magnitude of the field analyzed, and in determinateness with the degree of systematic articulation achieved by the analytic procedure.

Relevance of the Tests

Santayana[78] has demonstrated that aesthetic experience

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[77] Ibid., p. 42.

[78] George Santayana, The Sense of Beauty, Chaps. II-IV. New York: Charles Scribner's Sons, 1896.

consists of sensuous material, form, and expression. Material may be pleasant and beautiful independent of form and expression; form, which is independently a source of emotion, pleasure, and beauty, is the synthesis of a multiplicity of perceived sense elements; expression is the emotional value acquired from the thing of beauty through the association of present experience with external images, thoughts, and emotions. Specifically, he states: "In distinguishing, then, in our sense of beauty, an appreciation of sensible material, one of abstract form, and another of associated values, we have been merely following the established method of psychology, the only one by which it is possible to analyze the mind."[79]

The material of music is tone, which must acquire form to possess meaning. Stated in another way, material, form, and expression are comparable to the sensory, perceptual, and meaningful aspects of experience commonly distinguished by psychologists. Though a subsequent chapter is devoted to each of the Measures of Musical Background and the capacity it tests, the relations of the parts of the battery to the theory just outlined may be indicated.

Recognition of Tonality.- Test I measures the ability to identify the mode -- major or minor -- of musical selections and of chords. From the preceding discussion it becomes evident that the test concerned with the identification of tonality is on the

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[79] Ibid., p. 267.

formal level, measuring relevance of given composition to basic tonal orders. It does not measure the sensory capacity to detect differences in intonation in the manner of tests of pitch discrimination. Neither does it require the recognition of specific tonality or pitch through a sense of positive or absolute pitch. Absolute pitch is a valuable but not necessary musical ability, though, as the result of rather spectacular exhibitions, laymen are apt to attach a fictitious value to it; there are times when its possession becomes a disadvantage. Acute pitch discrimination is very necessary to the musician, but the chances are that if he can discriminate between tonalities he can tell whether or not a tone is "in tune",[80] whereas the reverse is not true. Even Seashore, in commenting upon the performance of his revised Measures with respect to pitch, recognizes this:[81]

> Another factor bearing on this issue is the fact that in actual music the appreciation of pitch is not so much a conscious discrimination for pitch, note for note, as a musical feeling for tonality, the satisfactoriness or unsatisfactoriness in musical feeling.

Musical talent or any other talent must carry with it the the sensory capacities requisite to its expression, or it does not

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[80] This, of course, does not apply to those individuals whose performances suffer from faulty intonation due to improper tone production.

[81] Joseph G. Saetveit, Don Lewis, and Carl E. Seashore, Revision of the Seashore Measures of Musical Talents, p. 47. University of Iowa Studies, Series on Aims and Progress of Research, No. 65. Iowa City, Ia.: University of Iowa Press, 1940.

exist; sensory capacities, conversely, need not sustain any given talent. The logic of talent testing above the sensory level is inescapable.

Rhythmic Discrimination.- Test II measures the ability to identify the meter -- to tell the number of beats in a measure -- in given compositions, and to determine the constancy of tempi -- whether the speed of the beat increases, decreases, or remains constant. These tests of meter and tempo respectively are also on the formal level, measuring the relevance of given composition to basic rhythmic orders. They do not contain abstracted rhythmic patterns -- intervals of time measured off by clicks -- but actual musical material, and sensitivity to the groupings and constancy of the rhythmic pulsations of this material is the function tested. Constancy and pulse pattern are the principal characteristics of any rhythm. If anything is measured by tests containing pairs of abstracted rhythmic patterns which may or may not be identical, it is memory. Recalling whether or not the second pattern was like the first does not necessarily involve a feeling for rhythm, and tests employing this technique are misnamed.

Dramatic Feeling.- Test III, concerned with the identification of the dramatic content of given compositions from selections offered, is on the third level, that of meaning. The nature of the kinds of meaning involved in music create difficulties for any test attempting to measure an understanding of them. Meaning in music may

or may not be meaning in the customary verbal sense: "Art is news of reality not to be expressed in other terms."[82] But emotional sensitiveness to the meaning of music is such an essential ingredient of musicality that an experimental test is more than justified. This important function is necessarily ignored by batteries attempting to measure musicality from an acoustic basis, whereas the meaning of music is its very essence and reason for being.

Knowledge of Musical Literature.- Test IV measures the ability to identify the title and composer of certain musical selections. This division is frankly a test of education, of "background" in the strictest sense, rather than of musicality as such. It is justified upon the same ground on which items of general information are included in intelligence tests as measures of brightness. It bears no relation to any aesthetic category, and is no doubt unfair to students of restricted training. It does, however, indicate those individuals having considerable experience in music (the probabilities being that the musical individual will have been attracted to music), and the talented but untrained student is protected by the remainder of the battery.

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82 Greville Cooke, op. cit., p. 9.

Summary

The origin of aesthetic feeling lies in the relations between sensation and judgment. The science of aesthetics is not an "exact" science, but rather a normative discipline. Experiment is possible, however, in art as well as in science, the difference being one of means and materials. Efforts such as Birkhoff's and Seashore's to base a science of aesthetics upon the physics of formalism ignore the connotative element in art and hence are inadequate. The Seashore tests are objectionable because as purely sensory tests they have only negative diagnostic value: they are concerned with auditory rather than musical capacities; it has also been shown that they do not perform consistently.

An alternative is proposed to the exact approach -- an experimental technique founded upon aesthetic analysis involving natural basic orders of perception fundamental to the relations between sensation and judgment. In the case of music these are tonality and rhythm. A battery of tests named the Measures of Musical Background has been constructed to embody this technique. The first two tests, Recognition of Tonality and Rhythmic Discrimination, measure relevance of given composition to basic tonal and rhythmic orders respectively. The third test, Dramatic Sensitivity, is concerned with sensitivity to the dramatic content of music. The fourth test, Knowledge of Musical Literature, measures acquaintance with certain representative compositions.

The history of the measurement of musical talent presents an interesting parallel to that of the measurement of intelligence, which began with the measurement of isolated sensory responses, and achieved success, qualified though it may be, only after it tested complex acts which were based upon common experience. The present study represents the latter approach. A description of the construction of the tests is contained in Chapter III.

CHAPTER III

CONSTRUCTION OF THE BATTERY

Title.- As stated, the battery is known as the Measures of Musical Background. The term Background is used in the widest sense. The test measuring knowledge of musical literature is the only one concerned with the more usual, and culturally narrower, interpretation. Hence the tests are not strictly talent tests, objectionable features of such batteries already having been noted. Rather they seek to discover status as an indication of potentiality, to suggest what can be done by measuring what has been done. Pure talent can exist only before exposure to experience. Environmental influences inevitably alter it or develop it, and it will alter or develop according to its capacity to do so. Hence, while the Measures of Musical Background recognize talent, they also recognize training, and test both as manifestations of potentiality. Background in any field is judged by performance; performance in any field is the index of promise.

Test Blanks.- Mechanical features of the test blanks include individual numbering to facilitate separate handling of tests, and provision on each test of space for marking the score, rank, and percentile. The title page is detachable. It contains a graphic record, and provision for a summary of scores, ranks, and percentiles. The actual test material in each test begins with item number 3, numbers 1 and 2 being examples.

Forms.- The battery is divided into two forms. Form A is intended for tenth grade and above, Form B for ninth grade and below, including the fourth. Both forms were phonographically recorded. Directions and announcements for Form A are recorded by a male voice, Form B by a female voice. The materials for Form B are drawn from Form A, and are identical in character and sequence where used. Directions and test blanks differ, however. The three tests of Form B -- I, II, and III -- are identical in content with I-A, II-A, and III of Form A. Copies of both forms are contained in Appendix A.

Recording.- The recordings were made by Arthur J. Havlovic, whose qualifications rest on many years of private experience and experiment. The material was performed for recording by vocal and piano students of the College of Music of Cincinnati, and by the College Symphony Orchestra.

Construction of Test I.- In Form A, Test I, Recognition of Tonality, Section A, Melodies, the material consists of four-part songs sung by mixed quartet; soli by a variety of voices, both accompanied and unaccompanied; soli by a variety of instruments, both accompanied and unaccompanied; selections on the piano alone; and orchestral selections. A wide variety of materials and media are intentionally presented. Form A, Test I, Recognition of Tonality, Section B, Chords, contains a succession of chords in related and unrelated tonalities. These occur in various positions, inversions, and registers, and were recorded from piano performance.

Form B, Test I, Major and Minor, is identical with Form A, Test I, Section A in material content. Appendix B contains a complete catalog of material.

Construction of Test II.- In Form A, Test II, Rhythmic Discrimination, Section A, Meter, the material consists of four-part songs performed by mixed quartet and piano, and symphonic excerpts played by symphony orchestra. Form A, Test II, Rhythmic Discrimination, Section B, Tempo, contains material identical with Section A, Meter, excepting that it is altered to suit the testing purpose: the tempi retard, accelerate, or remain constant. Form B, Test II, Counting, is identical with Form A, Test II, Section A in material content. The complete materials are listed in Appendix B.

Construction of Test III.- In Form A, Test III, Dramatic Feeling, the material consists of instrumental excerpts from standard operas played by symphony orchestra. Form B, Test III, Stories and Pictures, contains the same material, which is catalogued in Appendix B.

Construction of Test IV.- In Form A, Test IV, Knowledge of Musical Literature, the thirty selections are all presented in the original medium, vocal or instrumental, or a combination of the two. They occur in order of popularity (see Chapter VII). This test is not included in Form B. Appendix B contains the complete catalog.

Sources of Data on the Performance of the Tests.- To secure representative data on the performance of the measures, they were administered to 309 college freshmen in the music field

distributed proportionately among twelve institutions of higher education. These institutions and the administrative official whose cooperation made the testing possible and the date of testing are contained in Appendix D. It will be noted that the institutions named represent four states, and are about equally divided among universities, teachers colleges, and conservatories of music. The tests were also given to fifty-seven college academic students at the Teachers College of the University of Cincinnati, members of the general music class of Miss Sarah Y. Cline, on November 26, 1940. They were further administered to 467 senior high school students, 453 junior high school students, and 400 intermediate grade pupils at institutions also named, together with the cooperating administrative officer and the date of testing, in Appendix D. These schools are divided equally between metropolitan and consolidated village types, and are six in number.

The Criterion Group.- The present study is based upon the belief that valid measures of any capacity will "prove up" against individuals who obviously possess a high degree of such a capacity. In other words, such individuals will achieve high scores on the tests. To test the tests, therefore, they were administered in whole or in part to forty-two members of various college music faculties and the Cincinnati Symphony Orchestra. A complete list of this "criterion group" is contained in Appendix C. The mean performance of the group on each test is presented in Table III.

The Revised Scoring Key.- Obviously, it was not expected

that each member of the criterion group would achieve the maximum score. However, any concentration of error on any item or items of any test, Knowledge of Musical Literature excepted, could be interpreted as indication of fault in such items. It was arbitrarily decided that the answer given by seventy-five per cent of the group be accepted as the correct answer.

In Test I-A, Recognition of Tonality, Melodies, no such instance occurred, and the original scoring key was retained for all subsequent scoring.

In Test I-B, Recognition of Tonality, Chords, items 12, 29, and 46 were judged major instead of minor, or vice versa, by seventy-five percent of the group. In the revised key, therefore, either answer was credited for these items. Investigation proved the source of these errors to be indistinct recording; it is superfluous to note that three quarters of such a group would not mistake a major chord for minor, or minor for major, were it clearly presented for judgment.

In Test II-A, Rhythmic Discrimination, Meter, items 5, 25, and 28 were judged to count by three instead of six by seventy-five percent of the criterion group, and items 9, 10, 16, 18, 24, and 27 were judged to count by four instead of two. Accordingly, either answer was credited in the revised key. This two-four and three-six difficulty will be discussed at greater length subsequently. Item 22 caused so much disagreement and error that it was credited in all cases, the trouble seeming to lie in both brevity and indistinct recording.

In Test II-B, Rhythmic Discrimination, Tempo, items 5 and 19 were judged faster rather than constant, items 8, 9, 10, 15, 20, and 32 constant rather than faster, and by the revised key answers were accordingly credited either way. Some items seem to be too long for their purpose: rubati creep in and create confusion.

The difficulties arising in connection with Test III, Dramatic Feeling, will be discussed at some length later. Items 5, 7, 8, 18, 20, 21 and 22 were marked otherwise than according to the original key. Since in each instance the differentiation concentrated on one of the three alternative choices, this alternate was accepted in the revised key.

In Test IV, Knowledge of Musical Literature, there was, of course, no possibility for revision of the key. It is pertinent to note, however, that of the thirty-six individuals taking the test, the content of which had been set up by college teachers of music as a fair representation of what college music freshmen should know, two knew all of the numbers, and the only selection achieving unanimous recognition was Foster's Old Folks at Home.

Scoring and Norms.- The tests administered to all students were first scored with the original key, and so reported to the various institutions. After the construction of the revised key the tests were rescored and reported in terms of percentile ranks. These percentile ranks were computed for college music freshmen and senior high school (Form A), and for junior high school and intermediate

grades (Form B) after compilation of tables of errors demonstrated that refinement beyond these divisions would be somewhat useless, at least with the present data. Table I contains such a compilation for three tests, and is submitted both as a sample table of the type described and as support for the practice adopted with respect to the calculation of percentile ranks. The number of errors made on each item of the test does not vary appreciably from one grade of the senior high school to another. There are exceptions, of course, but as many in one direction as in the other. The papers from which these compilations are taken were selected at random, and serve to illustrate the homogeneity of the senior high school group.

Summary.- The present chapter states that the title of the battery, Measures of Musical Background, accurately defines its function, which is the measurement of musical status as an index of potentiality. It has described the test blanks, indicated that the performances for the recordings were by students of the College of Music of Cincinnati, and set down in detail the relationship between the two forms of the battery. The material content of each test was described. It was noted that the battery was administered to approximately three hundred college music freshmen, and fourteen hundred public school pupils, grades four through twelve, in eighteen institutions. It further described the administration of the battery to a criterion group of expert musicians, and the construction of a revised scoring key based on their reactions. Tests were scored by this key, and percentile ranks computed for college music freshmen,

TABLE I

INCIDENCE OF ERRORS ON THE INDIVIDUAL ITEMS OF TESTS I-A, II-A, AND III MADE BY 40 TENTH GRADE, 40 ELEVENTH GRADE, AND 40 TWELFTH GRADE STUDENTS

Item Number*	Test I-A			Test II-A			Test III		
	Grade 10	Grade 11	Grade 12	Grade 10	Grade 11	Grade 12	Grade 10	Grade 11	Grade 12
3....	17	17	17	11	11	5	17	14	13
4....	7	10	13	12	12	11	8	8	9
5....	9	12	8	35	37	34	38	35	37
6....	14	20	14	19	16	12	28	30	36
7....	7	12	16	12	23	18	24	19	28
8....	13	13	17	18	26	19	35	39	32
9....	7	7	12	37	38	35	21	24	21
10....	12	9	6	36	36	36	13	20	18
11....	15	17	17	34	35	36	22	19	21
12....	19	20	17	36	39	34	15	11	13
13....	12	19	22	24	21	18	21	21	17
14....	10	15	17	35	35	37	22	19	19
15....	22	19	18	17	20	14	26	22	29
16....	19	16	20	29	28	32	15	19	26
17....	24	26	20	24	24	16	28	23	21
18....	27	28	25	19	25	15	38	34	35
19....	14	19	14	33	33	29	23	25	27
20....	16	23	20	21	23	21	16	16	19
21....	15	12	10	18	22	24	19	16	17
22....	28	16	19	35	39	36	30	27	27
23....	12	12	13	17	12	12			
24....	17	11	16	35	32	32			
25....	10	16	15	36	39	32			
26....	10	21	20	22	24	19			
27....	22	14	18	31	37	37			
28....	11	13	13	37	40	36			
29....	20	16	18	15	24	14			
30....	4	12	11	39	38	36			
31....	10	8	11	24	25	19			
32....	6	11	7	23	14	16			

*Items number 1 and 2 of each test serve as examples, and hence are not scored.

senior high school pupils, junior high school pupils, and intermediate grade pupils. The ensuing four chapters contain a detailed analysis of the capacities tested by the battery.

CHAPTER IV

TEST I: RECOGNITION OF TONALITY

Chapter I proposed a three-fold analysis of music in terms of tone, rhythm, and emotional content. The present chapter is concerned with the reasons underlying the selection of the ability to recognize tonality or mode as the capacity to be measured in indication of potentiality in the tonal area. It is also concerned with the definition of tonality, and the discussion of its characteristics.

The Crucial Capacity.-- Several considerations determined the selection of sensitivity to modal difference as the variable to be tested. First, the division between major and minor is the one that is common to practically all modern music (modern in the broad historical sense). It is true that some music is written in the ancient modes, and that some makes use of the pentatonic scale, but even though it is recognized as such by the hearer it still carries a major or minor coloring. (Some individuals highly trained in classical musical theory may quibble on this point.) Music employing polytonality or atonality is a rare exception, and has been excluded from the test. Second, a measure of responses to major and minor is not open to the type of difficulty encountered by tests of consonance or harmonic feeling, where reactions are often determined by taste. Third, the genuinely musical individual

has this feeling: this sense of the harmonic (not necessarily what is harmonious) is basic to the ability to think musically. It may be objected that one thinks musically in thinking of a melody, but, to the musically talented, any melody implies a harmony. No test of pitch variability can touch this function; tests measuring the capacity to determine the tendencies of tones to move in certain directions come closest to it. Fourth and finally, the scale, major or minor, and the harmonic tissues that grow out of it, is the aesthetic pattern fundamental to the tonal element of music. These preliminary remarks delivered, some attention is due the concept of tonality.

Definition.-- Tonality is variously described according to its use. Most frequently, and it is in this sense that it is here used, it means feeling for key. In the hearing or performance of a composition we feel each harmonic progression, each melodic movement, in relation to the tonality or key in which the composition is written. If it changes key it modulates, and we are given a new basis of feeling, a new "system of tonal expectation"[1]. The central harmony about which the musical structure is built and with which it normally begins and concludes is called the tonic. Thus in the key of C-major the tonic is the C-major chord or triad: c-e-g; and all other harmonies in the key bear various degrees of relationship to this. There are fifteen major keys,

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[1] James L. Mursell, The Psychology of Music, p. 122. New York: W. W. Norton and Co., Inc., 1937.

and each has a relative minor using the same key signature. The flats and sharps of the key signature simply serve to preserve these family relationships among harmonies at different pitch levels. Hence a composition may be transposed to a higher or lower key in order to achieve a more comfortable voice range, or for other reasons, without destroying its intrinsic internal harmonic structure. It is claimed by many musicians, and probably upon good grounds, that keys have qualities, that the pitch level of a composition may not be changed without subtracting from its original effect. Beaunis[2] summarizes this opinion with these remarks:

> This emotional difference of sounds does not limit itself to sounds of varying pitch and modes, it extends itself to the tonalities, and this, is the opinion of all musicians, without explaining its peculiarity. It is sufficient to transpose a phrase to change completely its character. . . It must be said, however, that musicians are far from agreeing on the characteristic that must be attributed to each tonality.

This consideration, however, is beyond the scope of the present study.

Hence when a composition is in a major key we say that it is in a major tonality, or if it is in a minor key we say that

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2 H. Beaunis, "L'emotion musicale", Revue Philosophique, LXXXVI, (November-December, 1918), 360.

Cette différence émotionelle des sons ne se limite pas aux sons de diverses hauteurs et aux modes, elle s'étend elle-même aux tonalités et ceci de l'avis de tous les musiciens, sans qu'on puisse expliquer cette particularité. Il suffit de transposer un morceau pour en changer complétement le caractére. . . Il faut dire cependant que les musiciens sont loin de s'accorder sur le caractére qu'il faut attribuer à chaque tonalité.

it is in a minor tonality. Compositions are often named for their tonality, as Bach's B-minor Mass, Chopin's A-major Polonaise. Sir George Grove[3] sees key feeling as the result of evolution from the increasing harmonic organization of modal polyphony, completely supplanting the less universal values that depended on the particular character of a particular mode. Interpreted as a strictly historical statement this is no doubt true. In a broader sense it is probably more accurate to say that modal polyphony was one of several instruments by which key feeling was discovered. In other words, it did not evolve through growth; it was discovered through experiment. Grove also points out the dependence of form upon tonality for "intrinsic architectural coherence",[4] a point that has been contested in recent years.

Pratt[5] discusses tonality with reference to single tones under the name of octave quality: the striking resemblance of one tone to another even though they are separated by an octave in pitch.

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[3] Grove's Dictionary of Music and Musicians, Third Edition, Vol V, p. 356. New York: The Macmillan Co., 1928.

[4] Ibid., loc.cit.

[5] Carroll C. Pratt, The Meaning of Music, pp. 63-71. New York: McGraw-Hill Book Co., 1931.

He indicates that it is one of a number of qualities which come into being as the result of the relationship between tones, and properly identifies it, not as a simple auditory attribute, but as an attribute of tonal form. Tonality thus defined, the claim of this study that a test measuring the ability to recognize major and minor tonality is on the perceptual level gains additional, if unnecessary, verification.

Modality.-- Whereas the tone C possesses qualities which identify it as C from octave to octave, the scale based upon C or the triad of which C is the fundamental must be heard in order to make it recognizable as C-minor or C-major. The (tonic) triad is made up of the tones on the first, third, and fifth degrees of the scale. If the third is a major third -- two whole tones -- above the first degree or keynote the triad is major; if the third is a minor third -- one and one half tones -- above the first degree or keynote the triad is minor.[6] In the major scale certain distances are established between the steps, in the minor scale certain others are established. Redfield[7] points out that

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[6] For a good technical explanation of this, see Grove's Dictionary of Music and Musicians, Third Edition, Vol. III, p. 297. New York: The Macmillan Co., 1927.

[7] John Redfield, Music: A Science and An Art, pp. 187-88. New York: Alfred A. Knopf, 1928.

in using our present major and minor modes we have retained but two -- the Ionian and Aeolian -- of the twelve modes that are found in the natural scale, all of which differ melodically. One explanation of this has already been noted, -- that to our ears all of the ancient modes imply one or the other of the modern ones. Trotter[8] develops another:

> Church music was of Greek origin, and Greek music belonged to the Asiatic and not the European genus. It would, therefore, owe its origin not to the consonant instinct, which gave us our popular art, but to other causes. In Eastern art there may be traces of the consonant instinct, but it has not the moulding power that it possesses in our Western music. . . As we have seen, Western music is largely founded on the instinct for consonance, and therefore, the scale formation must spring from the chord, and as there are only two consonant chords -- the major and the minor -- there will only be two scales, the one having as its basis the major, the other the minor chord. But where there is no such basis, there may, and probably will be, any amount of different scales. . . Again, in Western music the instinct for consonance and the character of the dances, which dictated the rhythmic scheme of the music, made it imperative that there should be a certain centre, around which the sounds might be grouped, and that this centre should stand out as a home from which the music sets out, and to which it must return. The idea of key would, then, in the first instance be not so much the use of certain sounds making a scale, as a central sound around which other sounds circle, and which must be reached before a sense of repose is gained. But in the Eastern art there is no such insistence on key-centre.

He goes on to show that, after harmony grew out of the music of the people, and counterpoint out of that of the Church, a fusion came about to make one art with its "combination of melody, harmony, and counterpoint in one great rhythmic scheme".

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8 T. H. Yorke Trotter, Music and Mind, pp. 100-06. London: Methuen and Co., Dtd., 1924.

The modes of the Church disappeared in favor of the modes of the people.

A considerable amount of theorizing has been done concerning the relationship between the modes. Riemann[9] represents the extreme viewpoint in considering them opposite in all things. He analyzes the major triad as a minor third superimposed upon a major third, the minor triad as a major third superimposed upon a minor third. Major triads or chords he names by the root or lowest number, minor by the fifth or highest -- contrary to general usage. Thus C-major is "über c" ("over c"), A-minor "unter e" ("under e"). For Riemann, therefore, works such as Schubert's B-minor Symphony are improperly named. Durakkorde (major chords) he named Oberklange, Mollakkorde (minor chords) Unterklänge.

Waiblinger[10] quotes Külpe as holding Riemann's viewpoint -- "Der Mollakkorde ist also nichts anderes als die Umkehrung des Durakkordes" ("The minor chord is thus nothing more than the inversion of the major chord"). Waiblinger himself feels that major has one center, minor two ("Dur ist zentrisch, Moll ist beizentrisch").[11] The major chord, he explains, has a single

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9 Hugo Riemann, Elementar-Schulbuch der Harmonie-Lehre, pp. 9-10. Leipzig: Max Hesses Verlag, 1906.

10 Erwin Waiblinger, "Dur und Moll", Archiv für die gesamte Psychologie, XXIV (August 13, 1912), 7.

11 Ibid., p. 15.

tonic, its root. The minor chord has a double reference, namely the root and the third, the latter being the root of its relative major.

Concerning the German words for major and minor (Dur and Moll, that is, hard and soft) Külpe[12] explodes an ancient myth:

> An especial importance attaches to the two great chord systems at present employed in polyphonic music, the major and the minor, or, as they were originally called, hard and soft (German dur and moll). As at first applied, the names did not refer to a difference in the compound clangs, but were simply different terms in musical nomenclature, indicating a difference of scale. The sequence of f g a b-natural (b durum) was designated hard; and the sequence of f g a b-flat (b molle) soft. It is evident that the two words were primarily used in quite different meanings from those which they bear in modern music; and it is important to keep this fact in mind when we are tempted to draw an inference from the original names to the character and musical effect of the chords.

Mood Effects.-- Britan's[13] statement that "the most subtle effect of any of the harmonic factors in music is the psychological effect of the major and minor modes" will find little contradiction; disagreement will arise only when attempt is made to account for this effect. Britan explains it on the basis of mental interpretation fixed by custom and habit, returning to the Greek modes to prove his point, admitting, however,

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12 Oswald Külpe, Outlines of Psychology, pp. 297-98. Translated by E. B. Titchener, New York: The Macmillan Co., 1901.

13 H. H. Britan, The Philosophy of Music, p. 133. New York: Longmans, Green, and Co., 1911.

that there was still a subjective factor his theory did not account for. It is well known that the Greeks considered certain of their modes equivalent to our major to be soft and effeminate, others similar to our minor to be manly and warlike. Plato makes a definite point of this in his Republic. Beaunis[14] feels the distinction, but ends on a note of uncertainty in the statement that

> In our modern music, the major mode, more luminous, evokes a feeling of repose, of fullness, of satisfaction; it is gay, brilliant, open-hearted, whereas the minor mode, more sombre, shadowy, is accompanied by a feeling of uncertainty, of confusion, of sadness -- it is more indeterminate, melancholy, agitated, more moving. But there again, in viewing the evolution of music in retrospect, one will find the difference of race, and one will arrive at conflicting conclusions.

Tanzi[15] believes that

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14 H. Beaunis, op.cit., p. 360

Dans notre musique moderne, le plenitude, de satisfaction; il est gai, brillant, ouvert, tandis que le mode mineur, plus sombre, comme assourdi, s'accompagne d'un sentiment de vague, de désarroi, de tristesse, il est plus indéterminé, mélancolique, inquiet, plus émouvant. Mais là encore en remontant dans l'évolution musicale on retrouverait des différences de race et on arriverait à des conclusions opposées.

15 Eugenio Tanzi, "Concerning the Perception of Musical Chords" ("Sulla percezione degli accordi musicali"), Rivista di Filosofia Scientifica, VI, (1887), 174 - 75.

La diversità della portata emotiva attribuita ai due accordi non è certo convenzionale. L'estetica, coi suoi precetti, non ha fatto altro che riconoscere una legge naturale. Carlo Gounod (non è come illustre musicista che lo chiamo qui in causa, ma come acuto osservatore della proprie emozioni) all'età di cinque o sei anni distingueva già così perfettamente la natura dell'impressione suscitata in lui da ciascuno dei due accordi, che designò un giorno spontaneamente quello in minore come l'accordo che piange. Io ho potuto verificare un fatto analogo in persone, che nulla sapevano di musica, e che tuttavia riescirono senza difficoltà ad indicarmi

The diversity of emotional quality attributed to the two chords is not conventionally fixed. Esthetics, with its injunctions, has not done other than to recognize a natural law. Charles Gounod (it is not as the illustrious musician that I name him in this case, but as an acute observer of genuine emotions) at the age of five or six years already could distinguish perfectly the nature of the impression aroused in him by each of the two chords, that indicated as spontaneous lightness, that in minor as l'accordo che piange (the chord that weeps). I had means to verify an analogous fact personally, that, knowing nothing of music, one might nevertheless succeed without difficulty in indicating which of the two chords heard might be in major, and which, instead, in minor, being previously informed that the one would be gay and the other sad. There are always some, naturally slightly musical, who remain perplexed in judgment, but one must not conclude from this that in them the two sensations run together in the same mode.

Heinlein[16] has substantiated this in showing experimentally that most people discriminate between the modes in terms of feeling-tone. Such reactions were found to be extremely variable, both musically trained and untrained individuals confusing the qualities of the modes. Chords in the upper register called forth more major responses than minor, regardless of mode; chords in the lower register called forth more minor responses than major, regardless of mode. Loud chords under relative intensity changes evoked major responses; soft chords, minor. Heinlein concludes from this that there is no l'accordo che piange, that the modes have no intrinsic character.

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quale di due accordi ascoltati fosse in maggiore, e quale invece in minore, essendo preventivamente informati che l'uno era gaio e l'altro triste. Vi sono tuttavia certuni, nature poco musicali, che rimangono perplessi nel giudizio; ma non devesi inferire da questo che in esse le due sensazioni decorrano nell'identico modo.

16 Paul Christian Heinlein, "The Affective Characters of the Major and Minor Modes in Music", Journal of Comparative Psychology, VIII (April, 1928), 101-42.

Valentine[17] reports experimental evidence showing that:

> The major third and the minor sixth was described as sad twice as often as the minor third and major sixth.[18] Even when the third note is added in these experiments, and the chords c e g and c e-flat g are played, the major chord is still termed sad even more frequently than the minor, though, judging by his own introspection, the present writer is greatly surprised at this result. . . This supports the view that the usual effects for the minor key for modern Europeans are not due to any natural effect of the minor intervals taken alone. We may suppose that the custom of setting sad songs to minor keys originated without any felt suitability of the key to the ideas, but that gradually, by repetition of the association, we have come to connect the two, so that a piece of music in a minor key now usually appears to us sad or plaintive. In favor of this view, that there is nothing inherently sad about the minor key, we have the fact that even in some civilized countries the major key is used for sad songs and the minor sometimes for quite cheerful or even merry ones. . . Further, it is asserted that the music in the minor key played by some primitive peoples, while sounding sad and dirge-like to us, does not appear to be so to the natives.

Hevner,[19] employing a technique in which the material

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17 C. W. Valentine, The Experimental Psychology of Beauty, p. 104. London: T. C. and E. C. Jack, Ltd., 1919.

18 It has already been noted that the third is the "color-tone" of the triad: the major or minor quality of a chord is determined by the distance of the third from the root or prime. The impression of one mode or the other can be given by sounding the root and third of a chord, omitting the fifth, which was Valentine's procedure in order that he might invert them. Inversion is accomplished by raising the lower of the two tones an octave, or lowering the upper one an octave. Thus a third inverted becomes a sixth, major intervals minor, and vice versa.

19 Kate Hevner, "The Affective Character of the Major and Minor Modes in Music", American Journal of Psychology, XLVII (January, 1935), 103-18.

consisted of ten pairs of compositions -- each pair being two versions of the same composition, one major, one minor -- played on the piano, found from the responses of 205 listeners that "all of the historically affirmed characteristics of the two modes have been confirmed". Factors of musical background and training, musical ability (based on results from the Seashore tests), and intelligence were found to be influential but not essential in judgments of mood effects. The most obvious weakness of the study lies, of course, in the assumption that a composition written in a major tonality may be transcribed into minor with no injury to its content. It was a perfectly legitimate and feasible musical exercise, and seemed, no doubt, to offer perfect equation in the materials used. But the factor to be measured was affective character, not identity of tonality, and the present writer seriously doubts the aesthetic validity of "historically affirmed characteristics" achieved by the seemingly clever device of pulling a composition willy-nilly from one mode into another.

Reaction Time.- Of no direct pertinence to this study, but an interesting fact that may be noted in passing, is the difference in reaction time to the two modes. From the results of two series of experiments Külpe[19] reports the reaction time to minor chords as slightly but constantly shorter than to major chords.

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[19] Oswald Külpe, op. cit., p. 284.

Tanzi[20] has noted the same phenomenon.

Harmonic Feeling.- The opening paragraph of this chapter devoted some mention to the difficulties encountered by tests attempting to measure feeling for consonance or dissonance, owing to the impossibility of establishing criteria that will not crumble if set down upon the shifting sands of taste and training, no matter how well grounded in theory they may be. It matters not how many psychologists point out, as has Seashore,[21] that musical harmony is the result of historical evolution, the development of scales and modes, and that consonance depends upon the degree of sound waves. The indubitable fact remains that a test of musical capacity must measure potentialities of reaction toward musical phenomena, not toward physical abstractions. Musical consonance and dissonance may have acoustical explanations, but the growth of musical feeling for consonance and dissonance will never be guided by them. What was dissonance for the Greeks is consonance for us; what was consonance for the Churchmen is dissonance for us. Mursell[22] has devoted some pages to a very excellent summary of the theory of the tonal foundations of music.

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20 Eugenio Tanzi, op. cit., loc. cit.

21 Carl E. Seashore, Psychology of Music, pp. 125-26. New York: McGraw-Hill Book Co., Inc., 1938.

22 James L. Mursell, op. cit., Chaps. II-III, especially pp. 81-99.

Most important, he indicates, is the fact that consonance and dissonance are highly ambiguous terms, resulting in confused thinking in all quarters. He reviews Helmholtz' theory of beats underlying the criteria of smoothness and roughness; Stumpf's theory of fusion, -- the extent to which the tones of an interval sound as one; Ogden's theory of racial adaptation; and Lipp's theory of relational structure. In summary, he concludes that:

> Interval effects are determined by our perception of objective relationships among tones. . . Intervals constituted by the simple ratios are felt as more closely related than those constituted by more complex ratios. . . Interval effects are certainly not all the same as the resolution tendencies encountered in music. . . Interval effects are permanent and objective.

Chords as Test Material. -- Certain experiments have already been conducted involving the perception of chords. In a study concerned with the recognition of major, minor, and mistuned chords in all positions, Farnsworth[23] found that mistuned chords are judged minor more often than major. He hazards the suggestion that this fact may account for missionary reports of the wide use of minor by primitive peoples. Major and mistuned chords were found to be more easily identified than minor.

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23 Paul R. Farnsworth, "The Discrimination of Major, Minor, and Certain Mistuned Chords", Journal of General Psychology, I, (April, 1928), 377 - 79.

Farnsworth suggests that this may be explained by the fact that major chords are common, the mistuned ones "off". The experiment is unfortunately open to criticism on the ground that descriptions of major, minor, and mistuned chords as "active", "sad", and "neutral" are highly questionable with respect to both truth and adequacy. They are identical with those earlier employed by Meyer.[24]

Ortmann[25] reports an experiment involving the recognition of musical intervals, in which it was found that minor intervals were consistently more difficult than major. His conclusion that recognition of interval is a memory function which may be improved by study refers to interval width as well as modal quality.

Considerable space has been devoted in these pages to the criticism of the use of isolated tones or tonal patterns as test material. The following points are therefore submitted in defense of their inclusion in the measures under discussion:

(1) In testing the ability to discriminate between

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24 Max F. Meyer, "Special Ability Tests as Used in Missouri", Psychological Bulletin, XXII, (February, 1924), 114 - 16.

25 Otto Ortmann, "Notes on Interval Discrimination," Peabody Bulletin, XXVIII (May, 1932), 45-46.

major and minor chords, recognition of the quality that makes of a chord an entity is measured. A chord may be a complete musical fact.

(2) The use of chords supplements the use of melodies in measuring such discrimination. Too many individuals will achieve perfect scores on the melodies for the latter to represent a sufficiently wide scale of measurement. The melodies are necessary for the lower levels, but the chords are equally necessary for the higher ones. Their difficulty has intentionally been increased by arranging them in certain successions.

(3) Identifying the mode of a chord as such is not to be classed with identifying its mode through questionable descriptions of affective content, for it is simply and solely the recognition of an aesthetic pattern basic to music. Nor does it require the technical training necessary for the recognition of interval width.

(4) Practical experiment has revealed the utility of the use of chords. Reference has already been made to the relatively high correlations with achievement in sight singing and dictation reported by Taylor.[26]

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[26] Elizabeth M. Taylor, "A Study of the Relative Values of Certain Tests for Prognosis of Achievement in Sight Singing and Dictation", pp. 21, 24. Unpublished Master's thesis, Teachers College, University of Cincinnati, 1935. The reported *r* for sight singing was .477, for dictation .596.

Summary.- The ability to recognize major and minor tonalities was selected as the capacity to be measured in indication of potentiality in the tonal area because it pertains to the tonal division common to almost all music, because it avoids the difficulties encountered by tests of consonance and pitch variability, and because major and minor scales are the aesthetic patterns fundamental to the tonal element of music. Tonality was defined as feeling for key, and the differences in structure and effect between major and minor keys were outlined. Relations of modern to ancient modes were established. Experimental evidence was introduced purporting to show that the modes have no intrinsic character, and the fallacy of a physical basis for harmonic feeling was pointed out. Chords were defended for use as test material because they increase the difficulty range, because their use has experimentally been shown to be valid, and because they are used in the present test in such a way as to avoid difficulties common to their use elsewhere. Chapter V will discuss measurement of the rhythmic function in music.

CHAPTER V

TEST II: RHYTHMIC DISCRIMINATION

Capacities Tested

As will presently be indicated, considerable confusion attaches itself to the precise nature of the concept of rhythm. Hence it follows that for the practical purpose of the test under discussion certain arbitrary meanings for this concept and others related to it -- meter, time, tempo -- have necessarily been adopted. Such meanings may not achieve universal acceptance, but they are as widely accepted as any possible alternatives, and, their limitations understood and granted, for a consistent theoretical foundation for the present study.

It will be recognized by all qualified persons that, whatever their definition of rhythm, the phenomenon is characterized by impulses or stresses that arrange themselves into consistent patterns. The ability to detect the form of these patterns -- whether the stresses or beats come in twos or threes, fours or sixes -- is the capacity measured by Form A, Test II, Section A, Meter. The number of beats to the measure is the correct answer for all items. The title, Meter, is not strictly accurate, since the test is concerned only with the upper figure of the meter signature. It encounters still

further complication with respect to compound meters. However, a composition which "counts by four" and receives four beats to the measure by the conductor and has a meter signature of 12/8 should properly have a signature of 4/♩., as has been shown by Jaques-Dalcrose.[1] The test could be more properly named Takt than Meter, but for language complications.

Section B, Tempo, measures the capacity to detect consistency or inconsistency in the speed of the pulse or beat patterns. Thus the title does not refer solely to rate of speed or pace as such, rather to constancy of rate, which is the more important element of tempo in relation to rhythmic capacity.

It is contended that these two factors are the most important and easiest measured of any involved in the basic aesthetic pattern of musical rhythm, a contention that is borne out by the considerations presented below. They are measured, not as isolated abstractions, but as functional parts of actual musical material. Tests of rhythmic capacity have heretofore depended upon the technique of recognition of a second pattern as identical with or differing from a first, such patterns being made up of clicks with silent intervals between. Tests of

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[1] Emil Jaques-Dalcroze, Rhythm, Music and Education, Appendix, p. 1. Translated by H. F. Rubenstein. New York: G. P. Putnam's Sons, 1921.

"time sense" measure the ability to recognize a second time interval (silent) as longer or shorter than a first. A test of this character measures a certain sense of the passing of time, but certainly not a musical sense, for accurate division of time intervals, whether they be silent or filled with tone, in music is dependent upon feeling for constant rhythmic pulsation, the capacity measured by Test II, Section B. The "Rhythm tests" referred to above are little better than memory tests.

Rhythm

Confusion of Definition.- Some idea of the overlapping of concepts in this area may be gained from the following definitions:

> Rhythm -- That feature of musical composition which depends upon the systematic grouping of notes according to their duration. Kind of structure as determined by the arrangement of such groups.[2]

> Time -- The rhythm or measure of a piece of music, now marked by division of the music into bars, and usually denoted by a fraction expressing the number of aliquot parts of a semibreve in each bar (time signature).[3]

> Tempo -- Relative speed or rate of movement; pace; time; spec. the proper or characteristic speed and rhythm of a dance or other tune.[4]

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[2] The Oxford Dictionary, VIII, Part 1, p. 636. Oxford: The Clarendon Press, 1926.

[3] Ibid., X, Part 1, p. 38.

[4] Ibid., IX, Part 2, p. 168.

Rhythm -- Italy, France, and Germany have meant by 'rhythm' the larger distributions of metre, the composition of the phrase and the period. . . In English 'rhythm' means something more personal. A living sense of rhythm is based on an experience of actual failure and success; books cannot teach it.[5]

Those (Accent, Beat, Bar, Period, Tempo) are the formal elements of time; they stand over against the substance of music which is expressed in metre. . . Behind form and substance, and combining them, is rhythm.[6]

Tempo, term used in music signifying literally time, though in practice it has come to mean more often the speed at which a composition is, or should be, performed.[7]

Time, the kinds of time, i.e., of invariable rhythmic molecules underlying each continuous piece of music, are classed not only as duple and triple but also as simple and compound.[8]

Tempo, the time signature tells us nothing about the pace of a piece of music, for the choice of the denominator is determined by a tangle of historical associations. . . The sense of tempo is a larger aspect of body rhythm.[9]

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5 Grove's Dictionary of Music and Musicians, Third Edition, IV, p. 382. New York: The Macmillan Co., 1928.

6 Ibid., V, pp. 343-344.

7 Encyclopaedia Brittanica, Fourteenth Edition, XXI, p. 929. New York: Encyclopaedia Brittanica, Inc., 1937.

8 Ibid., XIX, p. 274.

9 Ibid., XIX, p. 275.

There is a feature belonging to music which has not yet been described -- that is, its measured movement, which we are in the habit of calling musical time or rhythm.[10]

Whence, out of this welter of confusion and ambiguity is to come order and reason? True, musicians understand each other in speaking of these entities, no matter what terms they employ for them, but this does not excuse slovenly philology. Language is robbed of one of its principal values when understanding of its meanings becomes contingent upon experience of the phenomena represented by its concepts. Possibly some day there will be agreement, either through the wear of usage or the mandate of qualified authority. Meantime, those who must needs employ these terms can do nothing save construct definitions applying to the purpose at hand, and hope for better days. The following pages, therefore, are devoted to the analysis, discussion, and definition of these concepts as employed in the present study.

The Concept of Rhythm.- Rhythm, says Prall[11]

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[10] William Pole, The Philosophy of Music, p. 160. New York: Harcourt, Brace and Co., 1924.

[11] D. W. Prall, Aesthetic Judgment, p. 154. New York: Thomas Y. Crowell, Co., 1929.

thus seen to consist in its essence in regular recurrence in time. What recurs may also be a rhythmic form. . . The strictly one-dimensional temporal pattern may be filled with any sort of sensuous content in a rhythmical pattern appropriate to this content. . . This emphasis (may) be achieved by pitch changes or accent . . at the critical defining points of time intervals.

Billroth[12] describes several incidents in which the intervals were not filled with sensuous content, purporting to show that rhythm can appear alone as music (Rhythmus allein kann schon als Musik erscheinen). These intervals were marked, however, by some sort of accent in order to exist. Redfield[13] advances a definition that includes in it a suggestion curiously paralleling Watson's theory of thought as silent speech:

Rhythm is periodicity of stress in auditory stimuli finding expression in muscular reaction, and must continue for a sufficient period of time that the muscles may become adjusted to the periodicity. The muscular reactions need not result in bodily movement, however.

Again, he states that

Rhythm has to do with the relative stress of musical tones, and greater stress may be given to a tone either by accenting it or by increasing its duration. . . There is the

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12 Theodor Billroth, "Wer is musikalisch?", Deutsche Rundschau, LXXXI, (October-December, 1894), p. 90.

13 John Redfield, Music: A Science and an Art, p. 213. New York: Alfred A. Knopf, 1928.

steady recurrence of the rhythmic stress called accent, repeating itself with but slight variation in every measure. Music such as this is called measured music and the rhythmic units into which it divides itself are called measures.[14]

Ruckmick[15] understands rhythm as "the perception of a temporal form or pattern in which individual members repeated periodically are consistently varied in any one or more of their qualitative or quantitative attributes", pointing out in addition that, while a rhythmic pattern is transposable, uniqueness and transposability being two outstanding characteristics of any gestalt, strictly speaking, the transposed pattern is not the same, though it may be recognizable.

The statements entered above outline very precisely the character of the phenomenon with which this study is concerned in its measurement of rhythmic capacity. Rhythm, for these purposes, is defined as consistent periodicity of relative stress in music.

Theories of Rhythm.- What rhythm is concerns this inquiry much less than the measurement of a capacity for it. Grove[16] calls it "an art of fusion", and distinguishes between

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15 Christian A. Ruckmick, "The Rhythmical Experience from the Systematic Point of View", American Journal of Psychology, XXXIX (December, 1927), 363. Ruckmick has constructed what is doubtless the most extensive bibliography in this field; see American Journal of Psychology, XXV (July, 1924), 407-13.

16 Grove's Dictionary of Music and Musicians, Third Edition, IV, pp. 382-383. New York: The Macmillan Co., 1928.

"performer's rhythm" which "reconciles in a flash the claims of the two warring constituents of melody,"time and pitch" and "composer's rhythm" which maintains a consistent level in a musical work. Genetically considered, rhythm is the source from which all of man's efforts at artistic expression through music, poetry, or dancing has sprung. Farnsworth[17] has developed an interesting classification of the theories of rhythm and the authorities espousing them. Under the first category comes the theory that rhythm is acquired through various overt actions, that there is no such thing as inherited rhythm. Exponents of this theory are listed as Max Meyer and Swindle. Second is the group who trace rhythm to organic action, such as respiration and the heart beat. Mentz, Meumann, and Seashore subscribe to this interpretation. Third is the attention theory, which states that regular rhythmic grouping is due to the straining of attention; accent would be an explanation of the greatest employment of attention. Meumann, Squire, and Dunlap endorse this interpretation. Fourth is the expectation and satisfaction group, who hold that rhythm differs from emotion in the small intensity of its moving effect on the subject, that rhythms are feelings of strained and fulfilled expectation. Authorities

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17 Paul R. Farnsworth, "The Development of the Rhythm Reaction: A History", p. 8. Unpublished Master's thesis, Ohio State University, 1922.

listed here are Wundt, Ebhart, Spencer and Gurney. Farnsworth could have added Puffer[18] to this list, who also defines rhythm as embodied expectation fulfilled. Fifth is the theory of kinaesthetic sensation, represented by Titchener, Pillsbury, MacDougall, Miner, Seashore, Stumpf, Krueger, Koffka, and Bolton. Seashore[19], included in two of the categories above, finds five capacities -- the sense of time, the sense of intensity, auditory and motor imagery, and motor impulse -- to underly the perception of rhythm, a thesis that will presently be examined. Britan[20] seems to have fallen into a genetic fallacy when he protests

> It will not suffice to regard rhythm merely as a property of nerve activity; its influence upon consciousness is the salient point in the matter. . . . the natural instinctive effect of rhythm is an emotional modification of consciousness. . . notwithstanding the later more artistic development of rhythm it never gets away from its primal character or ceases to modify the emotional tone of the conscious state into which it enters.

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[18] Ethel D. Puffer, The Psychology of Beauty, p. 157f. Boston: Houghton Mifflin Co., 1905.

[19] Carl E. Seashore, Psychology of Music, p. 139. New York: McGraw-Hill Book Co., 1938.

[20] H. H. Britan, The Philosophy of Music, p. 62. New York: Longmans, Green, and Co., 1911.

Is not this effect of emotional modification equally true of any element of music? And why should this effect be permitted to confuse the question of rhythmic origins?

Structurally considered, rhythm has been the subject of profound misunderstanding by analysts, both poetic and musical. Probably the best attempt to reconcile divergent interpretations into a systematic theory that is internally consistent and logically coherent has been made by Mursell.[21] He analyzes any total rhythmic complex or structure into unit groups, which go to make up rhythmic lines, which in turn make up a rhythmic pattern. He notes, however, that elements of this sort exist solely for the purpose of analysis, that our experience is not of such elements, but of a total pattern. And the impact of gestalt-theorie is again felt in the statement that, since the elements do not function in isolation and since their character is modified by their function in the whole pattern, a rhythmic structure must never be learned by elements.

Mursell makes out a fair case for the historical theory of rhythm, defending it where it most requires defense. But even he senses its weakness, for he supplements his interpretation

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[21] James L. Mursell, The Psychology of Music, Chap. V. New York: W. W. Norton and Co., Inc., 1937.

by espousing Takt[22] as the factor which introduces "orderliness into the complex and shifting pattern of the phrase rhythms". And he seems almost ready to abandon the whole scheme in the following sentences:

> There is no fixed rule for dividing up a rhythmic line into its constituent unit groups -- for analyzing or "scanning" it. The only rule and guide is our aesthetic perception of what is appropriate and correct, and our organic and muscular sense of what is convenient and comfortable.

Prall[23] has gone to some length in advocating the substitution of takt in English verse for the outworn and hopelessly inadequate system of classical scansion. He indicates that:

> The main obstacle, no doubt, in the way of our understanding verse structure, is the sort of scheme that makes all syllables into units of equal time value and omits all the pauses that would correspond to rests in music. It then goes on to confound accent with length. . and at the same time neglects those measured durations without which no temporal rhythm is possible.

What has happened is that scholars of literature, and musicians striving to be scholarly, in attempting to set up a mechanically perfect scheme of analysis, have either suffered from a lack of rhythmic capacity or have looked too deep for the key to temporal patterns. Any aesthetic pattern, it will be remembered, is directly apprehended from the presented sensory surface. Prall

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[22] Takt (Ger.) -- beat, or rhythmic impulse; zwei im Takt -- two beats in a measure.

[23] D. W. Prall, Aesthetic Analysis, Chapter IV. New York: Thomas Y. Crowell Co., 1936.

points out that certain psychological studies of rhythm seem to offer a contradiction at this juncture, a matter that will be discussed in considering the relations of rhythm and time.

The Perception of Rhythm.- Rhythm, of course, is never divorced from its perception. The construction of a formal theory of rhythmic analysis is predicated on the assumption that our senses will consistently recognize such structures. The phenomenon noted by Seashore[24] and others,[25] the unconscious and irresistable grouping of chance sounds (such as the tick of a clock or the sound of railway wheels) into patterns is stated by Ruckmick[26] to be due to perceptual ability: "A presentation of totally disorganized heterogeneous stimuli soon is brought into a semblance of order and later into more or less perfect order through the influence of the perceptual process itself". He writes elsewhere:[27] "As in spatial perception so it happens that in temporal perceptions like rhythm, three stages of rhythmic perception may develop:

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[24] Carl E. Seashore, op. cit., p. 138.

[25] Bolton's experiment is the classic in this field. Fifty subjects, save two found later to be unmusical, made groupings of ticks that were produced with absolute regularity by electrical apparatus. Bolton also noted that rhythmic impressions are limited to the range of 1 - .1 second. Thaddeus L. Bolton, "Rhythm", American Journal of Psychology, VI (January, 1894), 145-238.

[26] Christian A. Ruckmick, op. cit., p. 362.

[27] "Rhythm and Its Musical Implications", Proceedings for 1924, Music Teachers National Association, p. 58.

(1) attentive assimilation; (2) relational grouping; and (3) active counting. In reality the temporal order is reversed." He further asserts,[28] after experiment, that kinaesthesis is essential to the establishment of rhythmical perception; once perception is established, however, the rhythm may be consciously carried in the absence of kinaesthesis, by auditory or visual processes.

Mursell[29] speaks of these perceptual patterns as determined by accentuation, duration, and pause. This view is scarcely accurate, if rhythm be regarded in terms of the definition offered in these pages -- the consistent periodicity of relative stress. Pause and duration are determined by stress, and in the absence of stress act to give the impression of it. They are not, however, co-determinants. Howes[30] describes an experiment related to this point. Four organists

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28 "The Role of Kinaesthesis in the Perception of Rhythm", American Journal of Psychology, XXIV (July, 1913), 39.

29 James L. Mursell, op. cit., p. 169.

30 Frank Howes, The Borderland of Music and Psychology, pp. 95-98. New York: Oxford University Press, 1927.

played five hymns on a harmonium (on which accent was impossible). By means of an electrical mechanism registering the performances it was shown that the "strong" beats of the measures were sustained longer than the weak, and that "equal" notes were of unequal duration, indicating that where accent or stress is not possible duration is substituted in order to give the feeling of it as an organizing principle.

Billroth[31] offers a commentary on the incidence of perceptual ability with respect to rhythm which is interesting because of its source. Evidence presented from various regimental commanders in the German army showed that the ability to march is never acquired by some recruits, even after years of service, and by some underofficers and men of intelligence. Mountaineers and Slavic peoples marched poorly. Some thought they marched well, but did not. Billroth concludes that "There are people to whom the rhythmic feeling is not innate, and is likewise not to be imparted. They must be absolutely unmusical."

Types of Rhythm.- On the whole, it is much more reasonable to assume that rhythm may exist in different media

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31 Theodor Billroth, op. cit., p. 89.

Es gibt Menchen, denen das rhythmische Gefühl nicht angeboren und auch nicht beizubringen ist. Sie müssen absolut unmusikalisch sein.

than to postulate respective types of rhythm. Allen[32] quotes a French work describing three rhythms in music: a dynamogenetic one, a motor one, and an emotional one. Similarly, body and speech rhythms are sometimes separated.[33] Mason[34] comments that poetry and painting differ from music in that the rhythm is visual rather than audible. The present study has denied this possibility with respect to poetry. Both rhythms, Mason feels, are dependent upon accurate division into equal units, called meter. Differences arise in painting and music because of the difference between perception by ear and eye -- the eye can run back and forth over visual space for comparison or verification, while the ear proceeds easily in only one direction, comparison or verification depending on memory. It is suggested that if the eye proceeded only in one direction a regular meter of visual space would be helpful. Since it does not, a number of similar elements so ordered and proportioned that they become a unity may readily achieve rhythm.

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32 Warren Dwight Allen, Philosophies of Music History, p. 155. New York: American Book Co., 1939.

33 Encyclopaedia Brittanica, Fourteenth Edition, XIX, p. 273. New York: Encyclopaedia Brittanica, Inc., 1937.

34 Daniel Gregory Mason, The Dilemma of American Music and Other Essays, pp. 146-47, 155. New York: The Macmillan Co., 1928.

Effects of Rhythm.- The power of rhythm in the march, the dance, and in work command far too vast a literature to review here. Pratt's[35] citation of the orchestral works of Stravinsky and Ravel is scarcely necessary to remind us that we are quite as susceptible to stimulation of this kind as our primitive ancestors were. Touching the contemporary scene, Redfield writes:[36]

> The Jazzists. . . pound their rhythms home, over and over again, until the whole muscular system surrenders with complete abandon to the rhythmic frenzy; dignity, reserve, propriety even, may go hang, "we're gonta live anyhow till we die".

Parker[37] traces the pleasure in rhythmical arrangement to two sources: the need for perspicuity, which is fulfilled through regular rhythmic groupings; and the feeling of balance aroused through the relations of subordinate and superior stresses.

Primitive Rhythms.- No one knows quite how far back in history, or how far before history, the rhythmic impulse

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35 Carroll C. Pratt, The Meaning of Music, pp. 233-235. New York: McGraw-Hill Book Co., Inc., 1931.

36 John Redfield, op. cit., p. 213.

37 DeWitt H. Parker, The Principles of Aesthetics, pp. 165-166. New York: Silver, Burdett and Co., 1920.

extends. Havelock Ellis recounts the history of civilization in terms of the dance.[38] Definite records exist containing reference to the dances of the Greeks, the Hebrews, and the Egyptians. And "the practice of the ancients is closely paralleled by that of uncivilized nations in modern times. The Maoris have their war dance; the natives of Australia their corroboree; while the Javese indulge in a shadow dance peculiar to themselves".[39] The interesting point about rhythm among contemporary primitives, however, is the extent to which it is refined and developed. Redfield[40] states that Africans in particular are especially adept in the use of cross rhythms, and have developed complexities far more elaborate than any found in European or American music. Boulton[41] notes the same phenomenon.

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38 The Dance of Life, Chap. 2. Boston: Houghton Mifflin Co., 1923.

39 T. H. Yorke Trotter, Music and Mind, pp. 33-34. London: Methuen and Co., Ltd., 1924.

40 John Redfield, op. cit., p. 214.

41 Laura C. Boulton, "Some Aspects of West African Music", Bulletin of the American Musicological Society, No. 3, (April, 1939, as of June, 1938), pp. 10-11.

Time

The Concept of Time.- It is the contention of this study that music has nothing to do with time beyond the fact that, like any other event, it occurs in time. It occupies so much time, just as the individuals producing it occupy so much space. The closest relationship music bears to time qua time occurs in relation to metronome markings which establish the number of beats to the minute and thus set the speed or tempo of the rhythmic pulse. This position is, of course, contrary to general usage in many quarters, but examination will show that it supplies a clear way out of the ambiguities and misunderstandings that at present surround musical terminology. People say "He keeps good time" when they mean "He has a good feeling for rhythm"; or speak of the "time signature" when they mean the "meter signature". Some of the fallacy of this sort of thing becomes obvious if, when questioned as to how much "time" a half note receives, these folk answer "Two beats". If a half note had a time value that was intrinsic to music they should answer in terms of some measure of time, not in terms of rhythmic pulses. The ultimate triumph of this kind of absurdity is found in Grove's discussion of Time.[42]

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[42] Grove's Dictionary of Music and Musicians, Third Edition, V, pp. 343-346. New York: The Macmillan Co., 1928.

> Accent is an importance given to one note over another. This may be done by deliberate stress. . . but there are five other ways which may, or may not, be accompanied by stress. When accent recurs regularly it becomes the strong beat or pulse, a moment of action as against one of reaction, which marks the beginning of a group, bar or period. . . The bar is an arbitrary division providing orderly accents round which phrases may cluster. This orderliness is called time. There are many orders of time; time-signatures establish the rule, and various corrective or contradictory time-signs the exceptions which prove it. The period differs from the bar in being larger (as the group is smaller) and in not being marked off by bar lines. . . Irrespective of its divisions large or small, music goes at a certain pace (tempo); in a sense, pace is absolute, capable of exact definition, but in a truer sense it is relative, like everything else in music.
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> Those are the formal elements of time; they stand over against the substance of music which is expressed in metre. Metre is concerned with durations as such. . . Behind form and substance, and combining them, is rhythm. Rhythm . . is a judgment as to the meaning of music. Into this judgment accent, time, period, pace, and metre all enter in their degree; but in any concrete sense rhythm is personal to the musician in a sense in which the others are not.

An intelligent and experienced musician can read meaning into the above excerpt, but to the lay mind it is an utterly incomprehensible confusion of relationships, supplying one more cause for setting musicians apart from rational society.

Seashore[43] reviews the usual psychological evidence concerning our feeling for the passage of time, states that there is no evidence to show that sensitivity to time depends upon the structure of the ear, and then describes his test of the "Sense of Time". The test requires the recognition of the longer time

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[43] Carl E. Seashore, op. cit., pp. 90-92.

interval in each of a number of pairs of intervals marked off by clicks. Seashore, too, has ignored the fact that the passage of time in music is entirely subordinate and incidental to the rhythmic pulse. Time intervals are marked off in music, and, if there were any point in it, the time value of each note's duration could be measured. But such durations of time are not felt by the musician as durations of time, but as tones to be sustained (or, in the case of rests, silences to be maintained) until the passage of so many beats or pulses. As these beats occur at given points in the rhythmic pattern, they cannot properly be referred to as measures of time duration. If further proof be needed of the fallacy of the "time-sense" in music, one might imagine the execution of a rapid syncopated passage or saccade figure based solely upon a feeling for the passage of time, and entirely deprived of the support of the rhythmic pulse. Further examination of the relations of time and rhythm may clarify the point.

Rhythm and Time.- Once it is grasped that it is rhythm that imposes order on time, that the structure of any "temporal order" is entirely dependent upon rhythm for both its character and existence, the chief difficulty is overcome. Ross[44] reports an experiment in which this point is indicated, though such was

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[44] Felix Breune Ross, "The Measurement of Time Sense as an Element in the Sense of Rhythm", Psychological Monographs, XVI (June, 1914), 166-72.

not the original intention of the author. In an effort to measure "sense of time", subjects were required to identify one shortened interval in a second series of five, the first series having comprised five equal intervals. The intervals were established by instrumental clicks supplied by a synchronous motor apparatus. What the subjects really did was the identification of the shortened interval by means of the rhythm set up by the first five or more. Thus, instead of measuring "sense of time" Ross actually measured rhythmic sensitivity in terms of the ability to feel an irregularity in rate of pulsation.

The metronome has been mentioned as setting the speed of the rhythmic pulse or beat. This beat will never measure off a temporal pattern as exactly as the metronome, however, a fact which is the source of much misunderstanding. Britan,[45] in attempting to prove the intellectual character of rhythm, calls attention to its "mathematical foundation and exactitude", and offers as evidence the "mathematical exactitude of musical notation". Notation is and should be exact, but the rhythms of the music it represents never are. There are any number of experiments showing that trained musicians are unable to achieve

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[45] H. H. Britan, op. cit., pp. 83-85.

the theoretically correct ratios of value. Stetson and Tuthill[46] found that "the conception of a rhythmic unit group as an organized group of movements whose conditions are muscular comes near to fitting the facts." Sears[47] findings are virtually identical. Seashore, Small, and Henderson report the same type of variability with regard to vocal, violin, and piano performance respectively.[48] Musical rhythms are definitely not mathematical divisions of time. Dewey[49] sums it up very neatly:

> The identification of rhythm with literal recurrence, with regular return of identical elements, conceives of recurrence statically or anatomically instead of functionally. . . Of course, it may be possible to analyze mathematically an actually experienced rhythm into a combination of basic regularity overlaid with a number of minor uniform repetitions. But the result is only a mechanical approximation to any vital or expressive rhythm. It is similar to the outcome of attempts to construct esthetically satisfactory curved lines (like those of a Greek vase) out of the combination of a number of curves, each of which is constructed according to rigid mathematical calculation.

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46 R. H. Stetson and T. E. Tuthill, "Measurements of Rhythmic Unit-Groups at Different Tempos", Psychological Monographs, XXXII (No. 3, no month indicated, 1923), 41-45.

47 Charles H. Sears, "A Contribution to the Psychology of Rhythm", American Journal of Psychology, XIII (January, 1902), 28-61.

48 Harold Seashore, Arnold M. Small, and M. T. Henderson. All in Objective Analysis of Musical Performance. University of Iowa Studies in the Psychology of Music, No. 4. Iowa City, Ia.: The University Press, 1936.

49 John Dewey, Art as Experience, pp. 163-164. New York: Minton, Balch and Co., 1934.

One other factor, often overlooked, governs the duration of tones: the musical character of the composition in question. Two compositions may have identical rhythms, meters, and tempi, but if one is legato and the other staccato, to use extreme instances, the clock value of the durations accorded identically named notes will vary enormously from one composition to the other. This factor of interpretation, obvious to the musically gifted, is often puzzling to the non-musician, who sees only the mathematical inconsistency of the situation.

Tempo and Meter

The Concept of Tempo.- Translated literally, tempo would mean "time", but fortunately it is generally accepted as meaning "pace". The tempo of a composition is, therefore, the rhythmic rate of progress. Tempi are conventionally indicated by Italian terms denoting relative rates, the exact interpretation being left to the performer's taste (in recent years French, German, and English writers have tended increasingly to employ words from their respective languages). Some composers, more exacting and less trusting, indicate tempi by metronome marks, which definitely fix the speed of the beat.[50]

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[50] The metronome is a mechanism which can be set to tick at any given rate per minute within the limits of musical tempi. A composer wishing to establish a definite tempo for his composition therefore indicates the metronome speed and the kind of note receiving one beat. Each tick of the metronome then represents a beat, and the pace of the rhythmic pattern is

Absolute tempo or tempo giusto is strict and unvarying. Tempo rubato ("robbed") varies according to the demands of interpretation. It has been suggested that the law of compensation applies to tempo rubato, that what is "robbed" at one point is returned at another. This theory is as yet unverified.

The Concept of Meter.- Meter, from the viewpoint of this study, is simply the measure (as the name would indicate) of the rhythmic pattern. The meter signature standing at the beginning of a composition states in what terms the rhythmic pattern of this composition is measured. The upper figure notes how the rhythmic pattern "counts", if the rhythmic pulses come in patterns of two, three, four, or more. The lower figure indicates the kind of note representing one of these pulses in the notation. As Prall[51] shows so clearly, we have lost sight of the original sense of the term measure in music because it has taken on so close an association with that section of the staff that lies between two bar lines. In rejecting clock hours, or seconds, and insisting on rhythmic pulsation as

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established. Even metronome marks must not be accepted too literally, however, for a tempo that seems correct in one situation may seem incorrect in another. Tempo is relative to circumstance.

[51] D. W. Prall, Aesthetic Analysis, p. 98. New York: Thomas Y. Crowell Co., 1936.

the standard by which the duration of musical tones shall be judged we have simply rejected one form of measure for another, one involving a different unit of temporal length. It may be less accurate and less desirable "scientifically", but it is certainly the only possible one artistically. Triplett and Sanford[52] have made an interesting attempt to reconcile the two by timing recitations of rhymes and determining the relative values of intervals, expressing them as average percentages of the total time.

A measure (the space on the staff between two bar lines) then, in a properly written composition will contain one complete pattern of rhythmic pulses, the first of which is the strongest. A composition may begin on a pulse or beat other than this first or strongest, in which case, when it appears in writing, the first measure will be incomplete. As already indicated, the upper figure of the meter signature shows the number of these pulses in the pattern; in the case of a waltz, for example, it will be 3. The lower figure shows the beat note -- the kind of note receiving one rhythmic pulse. Usage makes the quarter note the beat note in the waltz, but it could as well be a half note, in which case the meter signature would

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52 Norman Triplett and Edmund C. Sanford, "Studies of Rhythm and Meter", American Journal of Psychology, XII (April, 1901), 361-87.

be 3/2, or an eighth note, 3/8, though this might not be as convenient to read. Some complication arises out of the fact that compositions having meter signatures of 6/8, 9/8, or 12/8 (or, for that matter, 6/4, 9/4, or 12/4) are performed at a tempo that makes the counting of six, nine, or twelve beats to the measure awkward if not impossible. Consequently the 6/8 counts by twos, one and four of the original one two three four five six receiving the beats; the 9/8 by threes, the 12/8 by fours. The true meter signatures thus become $2/\text{𝅗𝅥}.$, $3/\text{𝅗𝅥}.$, $4/\text{𝅗𝅥}.$.[53] (There is, obviously, no numerical equivalent for a dotted note in the same sense that 8 stands for an eighth note, 4 for a quarter note, or 2 for a half note.)

It follows that these figures should not be referred to as the "time signature", unless "time" is used in the loose and erroneous fashion already described. Neither should the meter signature be referred to as a fraction, though its appearance on the staff may seem to suggest one. If it is a fraction, what unity does it imply, of what is it a part? Music is filled with complexities enough to do well without such thoughtlessness.

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[53] See note 1, this chapter.

Form

Rhythm and Form.- Repetition and contrast are universally accepted as elements of musical form. These elements set up cycles that often induce writers to refer to forms as rhythmic, and to talk of the contributions of rhythm to form. Dewey[54] refers to the influence of the larger rhythms of nature, such as the cycle of seasons, by way of comparison. Parker[55] notes the relations of rhythm and balance in painting and architecture. Howes[56] feels that rhythm is the principle of coherence which gives structural unity to music: "there is a continual widening of the circle until rhythm becomes ultimately coincident with form or design".

Rhythms such as these are not the rhythms with which this study is concerned. In fact, it is doubtful if they are rhythms in the strictest sense. Prall touches on the problem with this comment:[57]

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54 John Dewey, op. cit., pp. 147-148.

55 DeWitt H. Parker, quoted by Melvin M. Rader, A Modern Book of Esthetics, pp. 238-39. New York: Henry Holt and Co., 1935.

56 Frank Howes, op. cit., pp. 111-12.

57 D. W. Prall, op. cit., pp. 99-100.

Temporal patterns using a measure longer than the span of direct aesthetic attention may be recorded as representing a temporal pattern in some graphic medium, or they may in various ways be imaged representatively in memory or abstractly conceived. But for direct apprehension neither season after season, nor day after day, nor death after life, is a literally felt recurrence of temporal interval, not a direct aesthetic datum. Such so-called rhythms may be represented aesthetically or recognized conceptually; but they are not in their own temporal duration and character presented in experience. They are represented by something else, which is directly experienced. They may be symbolized, not given. This is due to a limitation of our mode of apprehension. Time intervals have to be relatively short to be directly felt as definite durations, recognizable, rememberable, felt temporal lengths. For any temporal pattern at all, then, we require a relatively short measure, indicated to attention at both ends, and so involving its own recurrence.

Construction of Test II

Specifications for recording, announcements, mechanical features, and forms have already been noted in Chapter III for the entire battery. In Form A, Test II, Rhythmic Discrimination, Section A, Meter, the material consists of four-part songs performed by mixed quartet and piano, and symphonic excerpts played by symphony orchestra. Form A, Test II, Rhythmic Discrimination, Section B, Tempo, contains material identical with Section A, Meter, excepting that it is altered to suit the testing purpose: the tempi ritard, accelerate, or remain constant. Form B, Test II, Counting, is identical with Form A, Test II, Section A in material content. The test blank is, of course, altered (see Appendix A). The catalog of material for Test II is contained in Appendix B.

Summary

Rhythm is characterized by the formation of consistent patterns of stresses. The ability to detect the form of these patterns in terms of the number of stresses they contain -- in musical terms, the number of beats to a measure -- is the capacity measured by Test II-A, Meter. Test II-B, Tempo, measures the capacity to detect inconsistency in the pace of these patterns. Definitions of rhythm are notoriously confused. For the purposes of this study rhythm is defined as consistent periodicity of relative stress. Theories of the origin of rhythm trace it to organic action, attention, overt action, expectation-satisfaction, and kinaesthesis. Rhythm imposes order on time, but time has no relation to music beyond the fact that music occurs in time. Tests of the "sense of time" are fallacious. Tempo is the rhythmic rate of progress, meter is the measure of the rhythmic pattern. Rhythmic elements in form merely represent temporal patterns. The materials of Test II consist of four-part songs and symphonic excerpts. A discussion of Test III is set forth in Chapter VI.

CHAPTER VI

TEST III: DRAMATIC FEELING

The Capacity Tested

The third division of the Measures of Musical Background is designed to test affective responsiveness to music. It is thus psychologically one level above the first two divisions, which are concerned with the perceptual or formal processes of tone and rhythm. Any attempt of this nature is certain to encounter justifiable questions which grow out of very real psychological and aesthetic difficulties. Can music express emotions? If it does, can they be identified? Will this identification agree with any other? Are certain musical techniques always indicative of certain meanings?

The present study makes no effort to answer these questions. It is not directly interested in them, and holds that some of them are highly academic. It will consider them, in due course, but its position is based upon the facts that human beings do react affectively to tonal-rhythmic patterns; that these reactions differ in kind as well as in amount; and that certain great composers have written music intended to stimulate these reactions. It does not attempt to define either the reactions or the stimuli producing them; neither does it attempt to measure them in the usual sense. The variable it

does measure is the agreement of the individual tested as to the dramatic content of certain pieces of music with the composers of those pieces.

But how can the composer's meaning be determined? What, for instance, did Beethoven intend to be the dramatic content of the Seventh Symphony? There is no exact information on this point, though a guess might be hazarded. Information does exist, however, on the nature of the dramatic content Puccini intended to include in the music of the duet between Mimi and Rodolfo in the first act of La Boheme, or that Massenet intended for the last act of Thais, or that Wagner intended for the Venusberg scene. It may not be named consciously and specifically by auditors of the music, but they are sensitive to its meaning. A certainty on this point always exists within the boundaries of music written for the operatic stage, a certainty limited only by the calibre of the composer and the degree of his success. And if test material is restricted to the successful works of the greatest composers this certainty becomes practically unlimited: not only the composers' intentions are known, but also that they succeeded.

It is obviously risky to name these reactions. There remains, however, the alternative of describing them, or of describing the scene about which the music is constructed. This is the procedure adopted. The test contains twenty items,

twenty operatic excerpts, and the testee is asked to indicate which one of four one-line descriptions offered for each selection best describes its dramatic content. The title Dramatic Feeling is based upon a Webster[1] definition of feeling: "That quality of a work of art which embodies the emotion of the artist, and is calculated to affect similarly the spectator". In Form B the sets are limited to three descriptions, and the language is simplified; the title is likewise altered into Stories and Pictures.

Preliminary Considerations

The Fallacy of Emotion in Music.- It is common to hear music referred to as highly emotional, or to hear its "emotional content" discussed. Such reference is not strictly accurate. There is no emotion in music -- it is a psychological impossibility. Emotion is variously defined, but whatever its definition, reference is always to a reaction within the individual, never to the quality of the stimulus producing that reaction. Hence, music may produce emotion through the reaction of individuals to it, but it cannot contain emotion, as it is impossible

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[1] Webster's New International Dictionary of the English Language, p. 801, "Feeling", definition 9. Springfield, Mass.: G. and C. Merriam Co., 1929.

for it to be at once the stimulus and the response. So many individuals identify their feelings with the music producing them that a confusion results from the closeness of association. The process reverses itself in the creation of music. A composition may owe its form and quality to the emotion experienced by the composer, but what he has created does not contain his emotion, -- it is merely the result of it. If he is sufficiently skillful he may create music that stimulates feelings comparable to his in other persons, but the emotion is still within him and within them, not in the music. The music is merely the result of his emotion, the cause of theirs, containing neither.

Genetic Relationships.- Lee[2] has suggested that music and emotion have common ancestors, which were tropisms, or schemata of modality of movement. Physically they were -- and are -- postures and movements. Musically they are goings up and down, pressures and resistance, liftings, reachings, and retractions.

For what we are aware of as an emotional, an affective condition in ourselves, as when we feel cheerful, or sad, angry or loving, etc., consists for more than half, of a confused but dominating sense of our movements and postures, actual or potential. The existence of these schemata permit us to recognize posture and movement beyond our own body. And it is the

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2 Vernon Lee (Violet Paget), Music and Its Lovers, pp. 79-81. London: George Allen and Unwin, Ltd., 1932.

existence in our mind of such schemata that orients us in sound-space.

Helmholtz had anticipated this thought by half a century in the following excerpt.[3]

> Graceful rapidity, grave procession, quiet advance, wild leaping, all these different characters of motion and a thousand others in the most varied combinations and degrees, can be represented by successions of tones. And as music expresses these motions, it gives an expression also to those mental conditions which naturally evoke similar motions, whether of the body and the voice, or of the thinking and feeling principle itself. Every motion is an expression of the power which produces it, and we instinctively measure the motive force by the amount of motion which it produces. This holds equally and perhaps more for the motions due to the exertion of power by the human will and human impulse, than for the mechanical motions of external nature. In this way melodic progression can become the expression of the most diverse conditions of human disposition, not precisely of human feelings, but at least that state of sensitiveness which is produced by feelings. In English the words out of tune, unstrung, and in German the word stimmung, literally tuning, are transferred from music to mental states.

In this philological connection Pratt[4] cites several examples from seventeenth- and eighteenth-century English writings proving that the word "emotion" was used to describe disturbance of external events; its application to subjective conditions came later. His point is, of course, that many words can and do describe personal feelings as well as objective occurrences, and we cannot know which application came first.

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[3] Hermann L. F. Helmholtz, On the Sensations of Tone, p. 250. Fourth English Edition, translated by Alexander J. Ellis. London: Longmans, Green, and Co., 1912. (First German Edition, 1862).

[4] Carroll C. Pratt, The Meaning of Music, pp. 201-02. New York: McGraw-Hill Book Co., 1931.

Dewey[5] significantly observes that sound stirs emotion directly, "as a commotion of the organism itself", whereas sight agitates it indirectly through association and interpretation. The ear is the emotional end-organ. Vision functions with respect to meaning largely through connection with other senses, but sound has the power of direct expression through its own qualities. There is a generic intimacy between emotion and sound:

> Because of the connection of hearing with all parts of the organism, sound has more reverberations and resonances than any other sense. It is quite likely that the organic causes that render persons unmusical are due to breaks in these connections rather than to inherent defects in the auditory apparatus itself. . . Through the use of instruments, sound is freed from the definiteness it has acquired through association with speech. It thus reverts to its primitive passional quality.

Others have emphasized the importance of the motional connection between tones. Watts[6] believes it only necessary to achieve correspondence between the motions of music and those of human behavior for man to express his inner feelings. Howes[7]

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5 John Dewey, Art as Experience, pp. 237-39. New York: Minton, Balch and Co., 1934.

6 H. J. Watts, Foundations of Music. Quoted from Frank Howes, The Borderland of Music and Psychology, p. 80. New York: Oxford University Press, 1927.

7 Frank Howes, op. cit., p. 78.

holds that the motions of music arouse emotional reverberations, and points out the close connection between emotion, bodily movement, and the movement of music.

No doubt a great relationship between the motions of music and the emotions they arouse does exist. It is difficult to generalize, and dangerous to make the correspondence too specific, as will be indicated in discussing the expression of meaning by music. Such a theory does not account for purely harmonic effects or effects of timbre nearly as well as for those of rhythm and melody. In this respect Dewey's explanation is much more reasonable, and strengthens rather than weakens the hypothesis of common origins.

Aesthetic Emotion

The Character of Aesthetic Emotion.- While the test described in the present chapter intentionally circumvents most of the difficulties inevitably incurred by any attack on the problem of emotional response, no discussion of such a problem should ignore them completely. At the outset, there is little agreement as to what an emotion is, and less as to how it comes about, and whether we have emotions or just emotion is yet a point for argument. The term "aesthetic emotion" is a source of contention, some authorities maintaining that it cannot exist independently, others that it cannot exist at all. So far as it is discussed in these pages, "aesthetic emotion" refers to

the affective reaction to a work of art. And however aesthetic emotion may differ from "practical emotion", it must be noted that its physiological symptoms are much the same: a diffused upset of the whole organism, with specific reference to ductless glands and unstriped muscles. One word describes it best -- excitement.

Langfeld[8] points out that primitive art was often primarily for the purpose of arousing fear and passion, and believes that a gradual diminution of emotional response can be traced in the development of aesthetic appreciation. He further indicates that emotional response, when it becomes intense, is likely to take us out of a strictly aesthetic attitude, out of "that peculiar state of detachment so essential to appreciation". He hastens to add that the true aesthetic response is not intellectual; even though emotional response is absent, there is necessarily a feeling tone present.

It is sometimes difficult, however, to precisely define the nature of a response to an art such as music. In a study of the inheritance of musical talent, Stanton[9] interviewed six musicians of high rank. One factor distinguishing them was

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[8] Herbert S. Langfeld, "The Role of Feeling and Emotion in Aesthetics", Feelings and Emotions (The Wittenberg Symposium), pp. 350-51. Worcester, Mass.: Clark University Press, 1928.

[9] Hazel M. Stanton, Measurement of Musical Talent: The Eastman Experiment, p. 123. Iowa City: University of Iowa, 1935.

found to be the experience of "repeated emotional reactions aroused by musical stimulation expressed in the form of exhaustion, sobbing, exhilaration, transference into another world, conscious outgo of emotional power". Schoen[10] quotes the results of a number of interviews with musicians and persons of outstanding musical taste in a study of the nature of the aesthetic experience. In general, the reported responses are of the same nature -- muscular tension, ecstasy, and complete absorption being much in evidence. In an experiment relative to the nature of musical enjoyment, Gatewood[11] found that, other things being equal, those selections showing high emotional effect are most enjoyed. Myers[12] believes that the experience of beauty always partakes of the mystical or the ecstatic -- "the lost relation of the Self to its environment". Isadora Duncan reveals

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10 Max Schoen, Art and Beauty, pp. 165-166. New York: The Macmillan Co., 1932.

11 Esther L. Gatewood, "An Experimental Study of the Nature of Musical Enjoyment", The Effects of Music (Max Schoen, Editor), p. 90. New York: Harcourt, Brace and Co., 1927.

12 Charles S. Myers, "Individual Differences in Listening to Music", The Effects of Music (Max Schoen, Editor), pp. 36-37. New York: Harcourt, Brace and Co., 1927.

the possibilities of ecstatic response with characteristic abandon:[13]

> With Thode I sat in the darkened theatre and listened to the first note of the prelude of "Parsifal". The feeling of delight through all my nerves became so poignant that the slightest touch of his arm sent such thrills of ecstasy through me that I turned sick and faint with the sweet gnawing painful pleasure. It revolved in my head like a thousand whirls of myriad lights. It throbbed in my throat with such a joy that I wanted to cry out. Often I felt his slight hand press over my lips to silence the sighs and little groans I could not control. It was as if every nerve in my body arrived at that climax of love which is generally limited to the instant; and hummed with such insistence that I hardly knew whether it was utter joy or horrible suffering. My state partook of both and I longed to cry out with Amfortas, to shriek with Kundry.

The precise point at which a reaction such as the one just described ceases to be aesthetic will vary with the individual. Hevner[14] points out that any violent experience tends to absorb all of the attention, and destroy awareness of the components of aesthetic stimulation. She feels that any emotion that is present in an aesthetic experience is highly diluted -- more in the nature of a mood. Ortmann[15] shows us, however, that

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13 My Life, p. 149. New York: Horace Liveright, Inc., 1927.

14 Kate Hevner, "The Aesthetic Experience: A Psychological Description", Psychological Review, XLIV (March, 1937), 256.

15 Otto Ortmann, "The Sensorial Basis of Music Appreciation", Journal of Comparative Psychology, II (June, 1922), 255.

the aesthetic experience is not completely vitiated emotionally. An important part of musical enjoyment, he states, is of a non-auditory character, and many phases of enjoyment are the direct effects of the attributes of tone rather than the allegedly inspired character of the composition.

This aesthetic response has been variously analyzed. Ferguson[16] finds three factors of emotion -- circumstance, nerve tension, and motor outlet. Music is largely confined to representation of the second and third, literature and painting to the first. Music represents the emotional state itself rather than the stimulating circumstance. Beaunis[17] analyzes the musical emotion into the mentality of the listener, the pure auditive sensation, and the organic-muscular and tactile sensation. The first is adapted in such a fashion as to create background; the second responds especially to the aesthetic side of the musical emotion, and the third to the passionate side.

Is there a distinct aesthetic emotion, and if so,

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16 Donald N. Ferguson, "How Can Music Express Emotion?", Papers and Proceedings of the Music Teachers National Association, 1925, pp. 20-32.

17 H. Beaunis, "L'emotion musicale", Revue Philosophique, LXXXVI, (November-December, 1918), 366.

how is it distinguished? Vivas[18] holds that emotion is the accidental consequence of aesthetic expression, and seeks to discriminate between emotion and feeling, stating that it is feeling that enlivens the experience. Lee[19] believes that music "awakens two different kinds of emotion -- a dramatic one referred to by its expressiveness, and an aesthetic one connected with the presence or absence of what is known as beauty". Since any work of art expresses something, if nothing more definite than pure beauty, and all expression by artistic means is ipso facto beautiful, it is difficult to see just where this dualism leads. Pratt[20] states that emotions in art are neither real nor unreal: they belong in a class by themselves. To Dewey[21] "esthetic emotion is something distinctive and yet not cut off by a chasm from other and natural emotional experiences. . . esthetic emotion is native emotion transformed through the objective material to which it has committed its development

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18 Eliseo Vivas, "A Definition of the Esthetic Experience", Journal of Philosophy, XXXIV (November 11, 1937), 629-32.

19 Vernon Lee (Violet Paget), "The Riddle of Music", Quarterly Review, CCIV (January, 1906), 227.

20 Carroll C. Pratt, op. cit., p. 175.

21 John Dewey, op. cit., p. 78.

and consummation". Clive Bell[22] finds in significant form the quality common and peculiar to all objects that provoke the aesthetic emotion.

It will be recalled that distinction was made in Chapter II between the aesthetic attitude, which is purely contemplative and unconscious, and the constructive attitude containing the practical, scientific, and artistic attitudes, which are conscious and active. In agreement with these distinctions, Ducasse[23] suggests that any feeling whatever which is obtained in aesthetic contemplation is aesthetic feeling, and under certain conditions any feeling may obtain aesthetic status. Aesthetic feeling by definition presupposes the contemplative attitude; artistic feeling expresses itself in action. Those who would deny the existence of an aesthetic emotion, then, are confusing practical emotion with that of the sensory surface. Practical emotions are generic, and need not have unique embodiment, but are embodied in behavior. Behavior

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22 Quoted from Melvin M. Rader, A Modern Book of Aesthetics, pp. 246f. New York: Henry Holt and Co., 1935.

23 Curt John Ducasse, The Philosophy of Art, pp. 189-200. New York: The Dial Press, 1929.

may be a source of satisfaction, but it is the satisfaction of getting rid of the emotion, whereas the aesthetic interest is in conserving and contemplating. The creation of a work of art involves both, either in alternation or sublimation; the contemplation of a work of art involves both, but one after the other. In the creative process the artist expresses his inspiration or aesthetic concept through artistic means; in the appreciative process the resultant work of art stimulates the contemplator. So long as his emotion is confined to the contemplation of the sensory surface it is aesthetic; when it overflows into overt behavior it becomes practical. Religious ecstasy on viewing the Sistine Madonna or patriotic fervor on hearing La Marseillaise are aesthetic emotions; overpowering urges to gather converts to Christianity or to guillotine aristocrats for La Patrie are not. In the first instance the emotion grows out of contemplation; in the second, behavior grows out of the emotion.

The Function of Aesthetic Emotion.- These considerations bring us to the problem growing out of the relations of aesthetics and ethics. Art cannot exist solely for art's sake, -- it springs from the matrix of the social fabric and is in turn woven into it. The uplifting effect of contact with great works of art is almost axiomatic, but proves a most elusive quality to isolate and describe. Nietzsche found the highest good in this contact to reside in the creative process; Schopenhauer found it

in contemplation. Reference has already been made to the functions of art in primitive society, and to its effect upon members of a civilized social order. Dewey[24] comments on the emotional debauch enjoyed by some concert-goers. Art is inevitably connected with morality for its consumers, its appreciators, because it represents life with criticism, comment, or interpretation, and because it plays such a large part in our habits, emotions, impulses, and ideas. A work of art may be said to be immoral of itself only when it misrepresents by deliberate intention, but its worth to society is evaluated in terms of its effects. Both Nietzsche and Hegel interpreted Aristotle's catharsis to mean that man may gratify his passions otherwise than by indulging them on an antisocial or immoral level. What Aristotle really meant has been the subject of much debate. It seems probable that he referred to a process of purgation. A great tragedy portrays passion and portrays it vividly, and at the same time generalizes it. The spectator who is thus lifted into the atmosphere of the universal tends to be purged of everything that is petty and purely personal in his own emotions. Aristotle thus did not think, as did Plato, of how emotion is intensified by habit and contagion, but how it can be discharged or mitigated. Both Plato and Aristotle

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24 John Dewey, op. cit., p. 238.

believed the emotions might be disciplined by exciting them under moralizing influences.[25]

For the Greeks who lived five or six centuries before Christ, however, artistic values were not separate from political or social purposes. Plato, in particular, was resisting any change. He wished a social art -- not spectators, but creators and participants. If we live sacrificing, singing, and dancing there is no need for dramatic performances, for life itself would be the perfect drama, lived by men and women, not represented for them. The Greeks did not renounce life and retire into an inner world -- life was the great adventure, and their artistic powers were not diverted to the creation of compensations for the deficiencies of the present. We of today have made a cult of art, and the function of the aesthetic is all too often limited to that already much limited sphere accorded to beauty in the modern world.

The Measurement of Aesthetic Emotion.- Efforts in this area have centered about two approaches. Either physiological reactions are measured, or testing is based on verbal responses indicating some qualitative choice. The second technique subdivides itself into descriptions of imagery or mood, and judgment

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[25] An interesting discussion of this point is found in "Plato's Quarrel with Art", by G. M. Sargeaunt. The Nineteenth Century and After, CVI, (August, 1929), 230-42.

of merit, bearing a relation, implied if not titular, to the "appreciation" of music. Studies of the organic effects of music are not of direct interest to the present experiment, and in any event are of doubtful value to aesthetics per se. As Mursell[26] indicates, emotion should be regarded as a direct stress in the field of behavior rather than a mass of physiological responses. The associationist-behaviorist approach through measurement of blood pressure and endocrine secretions gives a most unsatisfactory account of emotion in art. Diserens and Fine present a comprehensive review of experiments in this field.[27]

Mood and imagery reactions are discussed subsequently under The Expression of Meaning. The "appreciation" technique has as its best exponent Hevner,[28] who makes a thorough analysis of the factors involved. Problems outlined in the study of music appreciation are types of listeners, differences in kind and degree of enjoyment, mood or emotional effects, meaning in

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[26] James L. Mursell, "The Application of Psychology to the Arts", Teachers College Record, XXXVII (January, 1936), 290-97.

[27] Charles M. Diserens and Harry Fine, A Psychology of Music, especially Chapters IX, X, and XI. Cincinnati: College of Music, 1939.

[28] Kate Hevner, "Appreciation of Music and Tests for the Appreciation of Music", Studies in the Appreciation of Art, Part 4. University of Oregon Publications, IV, No. 6, (February, 1934), pp. 83-150.

music, affective character of modes, effects of repetition, physiological effects, and motor theories. Activities involved in appreciation are sensory capacities, perceptual habits, affective reactions, symbolism, understanding, and taste. The tests she designs to measure these activities are (1) Music Discrimination, 48 items, in which the testee discovers the superior version of several presented, and the musical factor responsible for superiority (melody, harmony, rhythm); (2) Musical Concepts, three hearings of two numbers, testing emotional imagery, and knowledge of technical terminology and concepts represented; (3) Attitude toward Music, a verbal questionnaire; (4) Self Rating, also verbal, concerning experience, etc.

Other tests in this area of lesser scope are Trabue's[29] for ranking the excellence of 22 recorded compositions; Adler's,[30] involving choice of the proper version of four for each of six piano compositions recorded on Duo-Art rolls; and Vernon's,[31]

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29 M. R. Trabue, "Scales for Measuring Judgment of Orchestral Music", Journal of Education Psychology, XIV (December, 1923), 543-60.

30 M. J. Adler, "Music Appreciation: An Experimental Approach to Its Measurement", Archives of Psychology, XVII, (No. 110, no month indicated, 1929), 7-101.

31 P. E. Vernon, "A Method of Measuring Musical Taste", Journal of Applied Psychology, XIV (August, 1930), 355-62.

which is concerned with rating the musical value of imaginary concert programs, taste being judged by preference expressed. Adler's technique is similar to that employed by Abbott and Trabue,[32] wherein choice must be made of the "correct" version from four, three of which are altered. Abbott and Trabue had sentimental, prosaic, and metrical versions of their poems, as well as the originals; Adler used dull, sentimental, and chaotic versions of his musical selections. This technique is also employed in the field of art by the Meier-Seashore Art Judgment Test.[33]

This technique of altering works of art for testing purposes has incurred critical comment on several counts. Murray[34] claims that the Meier-Seashore Art Judgment Test, by mutilation of originals, often achieves a more expressive,

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32 Allan Abbott and M. R. Trabue, "A Measure of the Ability to Judge Poetry", Teachers College Record, XXII (March, 1921), 101-26.

33 Norman C. Meier, "A Measure of Art Talent", Psychological Monographs, XXXIX (1928), 184-99.

34 Elsie Murray, "Some Uses and Misuses of the Term 'Aesthetic'", American Journal of Psychology, XLII (October, 1930), 641.

dynamic, and aesthetically satisfying effect in the altered version than existed in the original. Mursell[35] waxes caustic with the remarks:

> It has occurred to the minds of various persons that appreciation means the ability to discriminate degrees of excellence in works of art. So poems, musical compositions, and pictures have been subjected to distortion, that is, versions have been made with certain changes which presumably detract from the excellence of the original. Usually, it may be remarked, there is not the least doubt about the fatal damage done by the alterations. The test then turns on one's ability to select the original as preferable to the distortion. Now the idea is not a bad one. But what we call "appreciation" is clearly very complex and many-sided. Whether any such test really gets at it, whether it reveals one of the significant symptoms, we simply do not know.

Munro[36] comments on the preference technique as follows:

> One trouble with such an approach is that an apparent agreement on general relative merit may cover a great difference in inward responses and modes of valuation. Another is that the psychologist's own assumption as to the relative merit of the examples may be questionable, so that conformity with it is no sure criterion of superior taste. . . Examples presented for choice are usually not whole original works of art, but reproductions and excerpts, black and white photographs of paintings, and phrases culled from musical compositions. Thus isolated, these fragments are apt to lose all their original significance. In "spoiling" them for test purposes one may be merely changing them into other themes, less smooth and concordant, perhaps, which would be equally good in some other context. All statistics resulting from such dubious "tests" are less scientific than they sound.

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35 James L. Mursell, "Mental Testing: A Protest", Harper's Magazine, CLXXX (April, 1940), 529-30.

36 Thomas Munro, Scientific Method in Aesthetics, p. 66. New York: W. W. Norton and Co., Inc., 1928.

It becomes obvious that to most test authors "appreciation" means "judgment of value". A test such as the Hevner test involves, as well as judgment, certain knowledge and skills contributing to it. The experiments with mood response to be described later come closer to the concept of dramatic feeling than to preference tests. Tests of taste are at best dangerous, for reasons noted. Tests dealing with unrestricted imagery are difficult to interpret. Tests involving knowledge or training place a restricted meaning on "appreciation". Truly great art should be as obvious to the unlettered as to the sophisticated, though the latter may be able to account for reactions in technical language. Sensitivity to the effects of music may be heightened by experience, but an education in music will never create a feeling for its dramatic content.

The Epistemological Problem

Emotion as a Source of Knowledge.- The contemporary philosophy of logical positivism declares that everything known is known through science, and that philosophy and metaphysics are only elevated emotional expressions. This view is based on the assumption that emotion and knowledge are essentially different, an assumption that is difficult to substantiate on consideration of the fact that every sensation has an emotional

tinge: the sensory surface is pregnant with emotion. In the child and in the animal the feelings of sensation and the knowledge of mood do not differ. The argument that the act of expression and the reading of it are different is not valid; the statement of the act is a vicarious experience, and would be relatively meaningless if the act had not been seen or experienced at some time. This does not mean that statement and reasoning are unnecessary. The point is that getting knowledge is not confined to statements or propositions; it is also derived through feeling.

As a matter of fact, thinking always has an aesthetic unity, and knowledge at its highest -- creative knowledge -- is dominated by feeling. No one thinks from premise to conclusion according to the formal scheme of logic; thought begins with the conclusion, and then premises are found for its justification. And an argument is unified by the development of feeling as the argument proceeds. Thus knowledge is not apart from feeling, but has a feeling tone; and art is an expression of feeling, but also has a cognitive value. Concerning this last, Prall[37] aptly states:

> But that the arts express deeply and broadly, but always determinately and uniquely, the very point of life, that they are the most precisely drawn lineaments of men's souls that we know, can not of course be questioned. To despise them

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37 D. W. Prall, Aesthetic Judgment, p. 217. New York: Thomas Y. Crowell Co., 1929.

totally, or to deny their expressive significance, is sheer brutality or ignorance. But especially in intellectual persons there is a tendency to minimize their precision and uniqueness of specification in expression. And this will not be overcome, of course, until men cultivate accuracy and skill in sensuous perception itself, and sound technical training in at least one of the particular arts, instead of feeding their souls so exclusively upon those ranges of experience that can be recorded in the linguistic symbolism of ordinary prose.

And again[38]

Our overwhelming absorption in language as the vehicle of meaning, the limiting of our education so exclusively to words in books, often makes us forget that not even language can do more than refer to meanings. These meanings we are likely to take for granted as lying fully within the symbolic medium itself, and significance and knowledge as being necessarily given in words and sentences. But the least scrutiny of such a notion is enough to remind us not only that words are only approximately determinate even in their denotative reference and furthermore that they could not possibly be these meanings that they carry, but also that for further specification or determinateness in the definition of their meanings we must point finally to a case of what is meant, as embodied in an object of present perception. And here our final appeal is clearly enough to sensuous discrimination and intuition, the object of such discrimination being an articulated sensuous surface, which is the last word in the specification and definition of meaning as such. . . To suppose, however, that meanings are more clearly specified in words than in the actually present intuited sensuous surface of works of art, or still worse to suppose that what is really expressed in any art may be translated into perfectly explicit statements in words, is not only to miss most of the expressive beauty of any particular work of art and the character of the fine arts as such, but also to forget the special function of language, and of poetry and prose.

Dewey[39] comments on "the sense of increase of understanding, of a deepened intelligibility on the part of objects of

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38 Ibid., pp. 225-26.

39 John Dewey, op. cit., pp. 288-290.

nature and man", but declines to define aesthetic experience as a mode of knowledge, on the ground that knowledge is instrumental to action, whereas aesthetic experience "becomes something more than knowledge because it is merged with non-intellectual elements to form an experience worth while as an experience". Dewey is, of course, forced into this position by his assumption that all knowledge is intellectual.

Prall touches on the uniqueness of each aesthetic expression in the quotation above. Others[40] have noted the same quality. Each instance of any given emotion will slightly differ from all others; the merriment of one composition is not the merriment of another, nor its sadness. The emotion of any composition is the specific emotion of that composition. This seeming lack of definition is not a weakness, nor common only to art. As Trotter[41] points out, an emotion disappears when we attempt to systematize it.

> We may say that we are glad or sorry, but we can only convey in the vaguest way in ordinary language <u>how</u> glad or <u>how</u> sorry we are. And yet our feelings are very real to us. So the power of musical expression is not lessened because of its vagueness.

Pratt,[42] too, notes that failure to specifically define in words

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[40] Frank Howes, <u>op. cit.</u>, p. 48.

[41] T. H. Yorke Trotter, <u>Music and Mind</u>, p. 230. London: Methuen and Co., Ltd., 1924.

[42] Carroll C. Pratt, <u>op. cit.</u>, p. 196.

the character of music does not mean that such character does not exist. "Who can find words to describe the mood that runs through the first movement of Mozart's great G-minor String Quintet?" he asks. "But who will declare, for that reason, that the mood is not there?"

Meaning in Music.- The argument against art as a medium of expression grounded on the variety of its interpretation carries a respectability born of long usage. Eduard Hanslick[43] stressed the point that there is frequently no agreement on what is expressed by music to prove that nothing is expressed, since no one can name it. And Redfield[44] serves to perpetuate the intellectual bias decried by Prall when he states that "music can present to the hearer only concrete sense stimuli; it is entirely beyond the ability of music to present an abstraction of any kind whatsoever", and asks what a composer would do who undertook to set the Gettysburg Address to music. In the first place, no two people ascribe quite the same meaning to any stimulus, and, secondly, music cannot convey the same

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43 The Beautiful in Music, p. 44. Gustav Cohen translation. New York: The H. W. Gray Co., 1891.

44 John Redfield, Music: A Science and An Art, p. 146. New York: Alfred A. Knopf, 1928.

kind of meaning that may be presented verbally any more than words can express the content of a work of art. Kinkeldy,[45] in referring to The Meaning of Meaning, by Ogden and Richards, notes that the process of communication demands (1) reference (thought), (2) a symbol, (3) a referent (thing signified). Direct relation exists between reference and symbol, and between reference and referent, but there is no necessary connection or relation between symbol and referent.

Redfield[46] concedes that insofar as music can imitate sounds it may be expressive. But art is not imitation. Much Hellenic thought contained the assumption that artistic representation was no more than a kind of commonplace reality, and that the essence of art lay in imitative relation to perceived objects rather than symbolic relation to an unseen reality behind those objects. The Platonic Socrates felt that evil characters should not be imitated in plays, lest imitations grow into habits. We also have the report of the Greek painter who painted the cherry tree so well that the birds mistook it and its fruit for genuine. This sort of thing led the Greek philosophers to campaign against

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45 Otto Kinkeldy, "Music and Meaning", Bulletin of the American Musicological Society, No. 1, (June, 1936), pp. 14-15.

46 John Redfield, op. cit., pp. 146-148.

art on the ground that it fosters deception, a theory which appears naive to us because we are aesthetically less sensitive than were the Greeks. But is creation imitation, and, if so, imitation of what? We know that perception is organized and selected; no one sees -- or hears -- reality. At best, the artist reproduces objects as they appear to him. A work of art is a composition, not an imitation. In a metaphysical sense, a work of art is truer to nature than an imitation of it. Imitation may be the means of art, as in sculpture and painting, or it may have nothing to do with it, as in poetry and music. Redfield is quite correct in his condemnation of certain types of program music; music that attempts to express verbal meanings is a failure at its inception.

Pratt[47] distinguishes two kinds of meaning in music; autonomous, accounted for in the tonal structure itself; and heteronomous, ideas and values not identical with the music. An example of autonomous meaning would be found in the character of finality brought about by harmonic or rhythmic means. Heteronomous meanings are found in the illusion of concreteness brought about by suggested association, and the arousal of bodily sensations through dynamism. The distinction is a nice one, but seems a bit difficult to maintain. How, for example, can we discrim-

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47 Carroll C. Pratt, op. cit., pp. 205-215.

inate as to the classification of effects that may carry "autonomous" meanings and yet arouse "heteronomous" ones? The wish immediately arises that the analysis had been carried further. Puffer[48] also takes account of music which is expressive by association or imitation, and that which is expressive by induction through internal relations of the notes.

Attitude to this problem will always turn upon our definition of meaning. When it is stated that music does not have meaning in the sense of direction or prescription no objection can be made. Words usually have this sort of meaning, a substitution for experience. By convention we know how to recognize a thing as corresponding to a particular word. Scientific statements are usually directions or prescriptions for attaining experience, experience itself not being expressed. In this sense a work of art does not have meaning, because a work of art does not give directions, but expresses experience itself. Thus there are two types of meaning, -- directing and conveying.

Granted that works of art express meaning, what do they express? Simply the meaning of the artist. He begins with an inspiration, which is an urge to express one's self -- a feeling or emotion or state of mind with an urge to embody it in an external

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[48] Ethel D. Puffer, The Psychology of Beauty, pp. 196-199. Boston: Houghton Mifflin Co., 1905.

medium. The choice of medium is determined by his talents. The artist clarifies and articulates the inspiration to himself: a work of art is the articulation of inspiration. The original inspiration is determinant and specific, a guide to and standard for later work. A work of art grows organically, as it is not a copy of an idea, but an articulation of it. A material object can express inspiration because the sensory surface is always permeated with a feeling tone; expression is always in sensory data, and sensory data are always emotional. If the work of art and the original feeling agree, the work of art is valid, but the artist is the only judge as to whether or not it is a correct expression.

The Expression of Meaning.- The futility of program music -- music that attempts to tell a story or describe an event -- has already received mention. In the broadest sense all music has a program, but only when it attempts to imitate verbal description does it descend to representation; and representation, insofar as it gains its meaning through external association with experience, has no place in art.[49] Program music of this character offers the most inviting opportunity for attack, for obviously its "meaning" can be understood only through the verbal description of its "program". Programs do not make great music, however; the

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[49] See Bernard Bosanquet, Three Lectures on Aesthetic, pp. 50f. London: Macmillan and Co., Ltd., 1915.

tone poems of Richard Strauss owe their eminence to their pure musical strength, not to their programs. Strauss is clever enough not to permit the program at any time to interfere with the demands of musical structure, dramatic power, and aesthetic beauty. The same is true of any successful writer in this idiom. A certain amount of representation, on the other hand, is not only permissible but necessary in music for the stage. Here the action takes the place of the "program", and there is no feeling of artificiality. This, however, creates a difficulty for the test under consideration (Dramatic Feeling). The material was all drawn from opera, and was intended by its composers to describe certain situations, or, more accurately, to convey the feeling of certain situations. How well the composers succeed without the suggestion supplied by scenery and action (for which a multiple choice of verbal descriptions is substituted in the test) raises several interesting points for consideration in the discussion of the test's validation.

Experimental Evidence

Studies of the expression of meaning in music fall into two categories. The first is concerned with imagery and expressed meaning resulting from stimulation, the second with stimulating factors responsible for the expression of meaning.

Studies Concerned with Expressed Meanings.- One of the oldest recorded experiments is that of Gilman,[50] in which thirty persons reported on their imagery and opinions of emotional content after listening to five vocal and six instrumental selections (violin and piano). Gilman notes a wide variation of opinion on both imagery and emotion; there was little agreement on imagery, but a fairly consistent core of agreement on emotional content. Valentine[51] repeated the experiment with shorter selections, claiming that Gilman's were so long as to contain several emotions, and eliminated leading questions from his instructions. His findings substantiated Gilman's, especially with reference to diversity of imagery. Downey[52] repeated the experiment with twenty-two subjects and six selections (piano only). She found that "it seems possible to hold provisionally that music has a somewhat definite emotional content. . . A great difference exists both in the capacity of individuals to receive definite impressions

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50 Benjamin Ives Gilman, "Report on an Experimental Test of Musical Expressiveness", American Journal of Psychology, IV, (August, 1892), 558-76, and V (October, 1892), 42-73.

51 C. W. Valentine, The Experimental Psychology of Beauty, pp. 114-115. London: T. C. and E. C. Jack, Ltd., 1919.

52 June E. Downey, "A Musical Experiment", American Journal of Psychology, IX (October, 1897), 63-69.

and of composers to convey them." Washburn[53] describes an experiment carried out by Weld at Clark University, in which a piece of music of "the most pronounced program type" failed to arouse imagery of the scene it purported to depict. She states, however, that "there is no such inconsistency in the emotions and moods awakened by music." Wells[54] reports an experiment in which twenty subjects were asked to select the correct titles of ten selections from a list containing the titles in chance order. Results contained few correct selections, which is not surprising in view of the above discussion of program content. Schoen and Gatewood,[55] in experimenting with mood effects, report a consistency, and, within limits, a definiteness and specificity of response. Better results were achieved with vocal than with instrumental music.

Watson[56] conducted an experiment in which it was attempted

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[53] Margaret Floy Washburn, "The Psychology of Esthetic Experience in Music", Addresses and Proceedings of the National Education Association of the United States, LIV (1916), pp. 600-606.

[54] F. L. Wells, "Musical Symbolism", Journal of Abnormal and Social Psychology, XXIV (April-June, 1929), 74-76.

[55] Max Schoen and Esther L. Gatewood, "The Mood Effects of Music", The Effects of Music, Max Schoen Editor, pp. 131-182. New York: Harcourt, Brace and Co., Inc., 1927.

[56] Karl Brantley Watson, Jr., "An Experimental Study of Musical Meanings," pp. viii + 135. Unpublished doctor's thesis, Duke University, 1939.

to determine the general level of musical meanings at different age levels, and to devise an instrument whereby ability to discriminate between such meanings can be measured. Meaning was defined as all types of response to music, no attempt at epistemological definition being made. A test of ability to discriminate between various meanings was devised, and standardization was based upon the judgments of twenty expert musicians. The test involved marking responses on a check list of word categories to phonographic recordings, and was administered to pupils of the sixth, eighth, tenth, and twelfth grades, and undergraduate and graduate college students. Three lines of evidence are cited in support of the conclusion that musical meanings are determined by constant factors in the music itself -- consistent discriminations in terms of constant musical attributes by experts, similarity of meanings at all levels with indications of growth from level to level, and predictable differential rates of growth.

Studies Concerned with Expressive Factors.- In the second category of studies falls that of Decker,[57] which employed fifty-two phonograph selections allegedly representing certain emotions, and involved some two thousand second grade to college level subjects, though a greater part of the data was supplied by

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[57] Harvey Lyle Decker, "Experiments on the Musical Portrayal of Emotion". Unpublished Doctor's thesis, University of California, 1933.

twenty. He concludes that music can sometimes portray emotion, that variability of response increases in inverse ratio to age, that volume per se affects judgment. He further reports that vocal selections were judged correctly more often than instrumental for certain emotions; that there is no difference in judgment between orientals and occidentals; that correct judgment correlates but slightly with I.Q., musical ability (as measured by the Seashore tests), and musical training (as measured by the Kwalwasser-Ruch test); that musical portrayal of emotion is based on similarity between the musical expression and the natural vocal expression of such emotions. The experiment is unfortunately open to a number of criticisms. First of all, the word "Portrayal" in the title is of doubtful accuracy. Of his criteria for selecting representative compositions, three are somewhat dubious: statements of critics or writers, explanatory folders with the records, and his own opinions. Finally, his technique in playing selected bits from the recordings was necessarily crude.

Heinlein[58] reports that the character of sadness considered intrinsic to the minor mode may be weakened by changes in intensity, time, and movement. Conventional judgments of the emotional qualities of major and minor have been experimentally

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58 Christian Paul Heinlein, "The Affective Character of Music", Volume of Proceedings for 1938, Music Teachers National Association, pp. 218-226.

shown to be based on intellectual discrimination. Musical relativity plays a large part in this connection. Hevner[59] gives a summary report of six of her studies in this area. She concludes that we must not study music alone, nor the listener alone, but the relation between the two. Absolute universality and rigid symbolism are not possible, as much depends upon attitude, training, and the mood of the listener. Findings are always broad generalizations. She advocates a technique involving the grouping of words in terms of a general mood, this allowing for individual differentiation in feeling for words, permitting generalized effects to emerge, and lending itself to quantitative treatment. Music played for classification were recorded selections from the best of classic, romantic, and modern composers. Table II indicates her findings.

Among studies in the second category described above is that of Gundlach.[60] Forty musical phrases were judged as to mood by 112 observers, who marked their opinions on data sheets containing seventeen mood categories, with space for additions.

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59 Kate Hevner, "Studies in the Expressiveness of Music", Volume of Proceedings for 1938, Music Teachers National Association, pp. 199-217.

60 Ralph H. Gundlach, "An Analysis of Some Musical Factors Determining the Mood Characteristics of Music", Psychological Bulletin, XXXI (October, 1934), 592-93.

TABLE II

RELATIVE WEIGHTS FOR MUSICAL CHARACTERISTICS
FOR EACH AFFECTIVE STATE FROM SIX EXPERIMENTS*

	Mode	Tempo	Pitch	Rhythm	Harmony	Melody
Dignified Solemn	Major 4	Slow 14	Low 10	Firm 18	Simple 3**	Ascending 4
Sad Heavy	Minor	Slow	Low	Firm	Complex	----
Dreamy Sentimental	Minor 12	Slow 16	High 6	Flowing 9***	Simple 4	----
Serene Gentle	Major 3**	Slow 20	High 8	Flowing 9	Simple 10	Ascending 3**
Graceful Sparkling	Major 21	Fast 6	High 16	Flowing 8	Simple 12	Descending 3**
Happy Bright	Major 24	Fast 30	High 6	Flowing 10	Simple 16	----
Exciting Elated	----	Fast 21	Low 9	Firm 2**	Complex 14	Descending 7
Vigorous Majestic	----	Fast 6	Low 13	Firm 10	Complex 8	Descending 8

Numerical values are ratios-of-difference to probable error; D/PE_d.

* Adapted from Kate Hevner, "Studies in the Expressiveness of Music", Volume of Proceedings for 1936, Music Teachers National Association, p. 212.

** Not statistically reliable.

The selections were then analyzed as to range, pitch, speed, volume, rhythm, and intervals, after which the attributes of each mood in terms of musical characteristics were determined. It was concluded that clearly certain moods belong in one dimension, others in a quite different one.

In an elaborate study of musical symbolism, Sorantin[61] analyzes the melodic and rhythmic figuration of a large amount of music, and emerges with the conclusion that "music portrays certain fundamental feelings clearly and distinctly". He falls into the error that is so inviting to all analysts in this field, however, and attempts to refine his analysis too far. A parallel example is found in those studies of facial expression which catalog photographs according to an emotion named.[62] Broad generalizations are relatively safe, but precise verbal description and the cataloguing of a definite symbolism are of doubtful value, for reasons already noted. Gurney[63] flatly states that "the very act of cataloguing a few of these emotional characters makes one

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[61] Erich Sorantin, The Problem of Musical Expression. Nashville: Marshall and Bruce Co., 1932. Pp. vi + 123.

[62] See Carey Landis, "The Expression of Emotion", The Foundations of Experimental Psychology, Carl Murchison, editor, pp. 493-495 for a discussion of such studies. Worcester: Clark University Press, 1929.

[63] Edmund Gurney, The Power of Sound, p. 336. London: Smith, Elder and Co., 1880.

feel how transient and uncertain they often are". Some of the music used by Sorantin is operatic or contains a text, and the implied mood is obvious, but others he analyzes according to his own interpretation. The study is further weakened by his overwhelming preference for German music. Rigg[64] conducted an experiment in which he used six compositions of his own and fourteen from the Sorantin study, all being played on the piano to 100 auditors. Responses were made first without and then with the aid of a checklist of suggested emotions. Rigg's own material involving specific features (composed especially for the study) fared better than Sorantin's classics. Findings were uncertain, excepting that the Sorantin theory for joy seemed "to have a large element of truth".

It is probable that the nearest we shall get to a solution of the problem of musical symbolism is Pratt's[65] dictum that the music simply sounds the way the moods feel. Certainly no atomistic technique will ever carry us far beyond broad generalities. As suggested earlier in this chapter, the motional attributes of music are very likely closely connected to the emotions it stimulates;

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64 Melvin Rigg, "Musical Expression: An Investigation of the Theories of Erich Sorantin", Journal of Experimental Psychology, XXI (October, 1937), 442-55.

65 Carroll C. Pratt, op. cit., p. 203.

other musical techniques refine or heighten the stimulation. But when we cannot adequately describe the nature of the response it seems futile to project an analysis for causal factors in the stimulus.

Construction of Test III

Specifications for recording, announcements, mechanical features, and forms have already been noted in Chapter III for the entire battery. In Form A, Test III, Dramatic Feeling, the material consists of instrumental excerpts from standard operas played by symphony orchestra. Form B, Test III, Stories and Pictures, contains the same material; the test blank is, of course, altered (see Appendix A). The catalog of material for Test III is contained in Appendix B.

Summary

Test III is designed to measure affective responsiveness to music by requiring a choice from responses offered which are descriptive of the dramatic content of certain operatic selections, these selections having known relevance to definite scenes, situations, or moods. Sound and emotion have a direct relationship. Aesthetic emotion is affective reaction to a work of art, differing from practical emotion not so much in physiological symptoms as in its opposite relation to overt behavior. Most attempts at the measurement of aesthetic emotion employ a technique requiring a verbal response indicative of a qualitative choice. Emotion may be a source of knowledge; difficulty arises in the precise verbal expression of this knowledge. Studies dealing with the expression of meaning in music are concerned either with expressed meanings from music or with expressive factors in music. The materials of Test III consist of instrumental excerpts from standard operas. A discussion of Test IV is set forth in Chapter VII.

CHAPTER VII

TEST IV: KNOWLEDGE OF MUSICAL LITERATURE

As indicated in Chapter II, this fourth test finds its justification for inclusion in the battery on the same grounds upon which items of general information are included in intelligence tests as measures of brightness. It is perfectly true that an individual might be a musical genius, but, owing to accident of environment, be utterly innocent of any knowledge of musical literature. Granting the possibility of such an extreme condition, the strong contrast between high achievements on the first three tests and lack of accomplishment on the fourth would immediately mark an individual for investigation. Many intelligence tests include material that implies training and education: possession of certain information in some degree is a characteristic of intelligence. And the probability is high that the musically gifted person will, by the very nature of his talents, be drawn into contact with some good music. In any event, a test purporting to measure musical background has every legitimate right -- and need -- to recognize differences in educational status. The trained musician will score higher on any of the tests than his equally talented but untrained brother. But no amount of training will insure success on the tests for the untalented.

Preliminary Steps.- The first task lay in securing a representative list of compositions that the musically literate should know. Within reasonable limits, one list would probably be as good as another, but it was felt desirable to secure authoritative approval for such a list. To this end a check list was constructed containing the names of the compositions mentioned most frequently by actual count in four standard music appreciation and music history texts.[1] This brought the problem of selection down to a workable catalog of seventy-eight compositions, a copy of which is presented in Appendix F. It will be observed that space was provided for the addition of such titles as might be thought desirable. A copy of this check list together with the following letter was then sent to the director, the chairman of the department of music education, and the teacher of history and appreciation of music respectively of twenty geographically representative colleges of the National Association of Schools of Music.[2]

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1 Bauer, Marion, and Peyser, Ethel, How Music Grew. New York: G. P. Putnam's Sons, 1925. Pp. xix + 602.
Faulkner, Anne Shaw, What We Hear in Music. Camden, N.J.: RCA Victor Co., Inc., 1929. Pp. 672.
Pratt, Waldo Selden, The History of Music. New York: G. Schirmer, Inc., 1927. Pp. 713.
Welch, Roy Dickinson, The Appreciation of Music. New York: Harper and Brothers, 1927. Pp. xv + 192.

2 States represented were California, Colorado, Connecticut, Illinois, Iowa, Massachusetts, Michigan, Minnesota, New York, Ohio, Pennsylvania, South Carolina, Wisconsin.

In the course of a piece of research here it has become necessary to determine just what music a student should be able to recognize before entering as a freshman at this or any comparable institution. To this end the enclosed list has been compiled from standard appreciation texts. We are asking you and other faculty members of National Association schools throughout the country to indicate thereon the twenty selections which represent minimum necessity. Please believe us sincerely appreciative of your cooperation, and the trespass upon time and good nature it involves. We shall welcome any opportunity to return the favor.

It will be noted that college entrance level was specified; the original test was constructed for the purpose of quickly classifying freshmen entering the music field.

Reactions.- To this letter were received twenty-six replies complying with the request without comment. To the individuals so responding the following acknowledgement was made.

We have received the questionnaire you so kindly filled out, and wish to acknowledge our debt of courtesy. Should you be interested, we will be very happy to supply a more comprehensive explanation of the work at its completion.

Fourteen individuals added titles to the list which they felt should be included, and/or expressed interest in the work. The following letter was addressed to them.

We have received the questionnaire you so kindly filled out, and found your added comment most interesting. While it is impossible to supply a more comprehensive explanation of the work prior to its completion, we shall be very happy to do so at that time. Meanwhile, permit us to express our appreciation of your interest.

Four individuals acknowledged the request, but refused to comply for various stated reasons. These were answered as follows:

We sincerely regret that you found it impracticable to fill out the questionnaire we recently sent you. Permit us,

however, to express our appreciation of your comment, which we found most interesting. We shall be very happy to supply a more comprehensive explanation of the work at its completion.

No response of any nature was received from sixteen of the addressees. It was later learned that the decease of one had occurred several days before the mailing of the check lists.

Comments.- The following ten excerpts will give a sampling of the general tone of individual reactions.

I wish to express to you my appreciation of the object of your splendid letter -- that of determining what students are eligible to enter the "four year course" offered by the National Association of Music Schools, of which we are a member. This, I am certain, will be of great value to both teacher and student.

You will find your list checked. The difficulty encountered is that the twenty selections checked are only about half enough.

I am returning herewith your list of items for a proposed music recognition test. Ten of my twenty selections are pieces added by myself, since they seem to me to deserve a place on the list of tunes everyone should know. Incidentally I am forced to wonder whether recognition of any music should be made a requirement for admission to a conservatory, beyond the simple act of recognizing some tunes as proof of a musical ear or memory. The opportunity for hearing music varies so greatly in individual cases that it seems to me that a test such as this proposed one might easily prove unfair and no true index of musical receptivity. Better by far in my opinion (which was, I realize, unsolicited on that point!) would be a similar test as essential qualification for a diploma.

I have checked twenty compositions on your list but I feel that the result is altogether unsatisfactory, and I hope you will forgive me for expressing the opinion that it would have been better if you had asked us to check forty or fifty instead of twenty.

As a matter of curiosity I took an hour of my Musical History time and went through the list with my class, playing the principal subjects for them. I found that, except in a few instances, I could get the right answer from at least one or two members of my class. The result of this test leads me to suggest that it might be difficult to select from your list twenty compositions

which I would feel that everyone should know; that is, that every immature music student should be acquainted with. Might it not be better to select a list of fifty to seventy five compositions, from which the candidate would be required to recognize twenty or more?

Your letter of March 7 has been taken up with the directors. We adhere strictly to the requirements for entrance qualifications as laid down by the National Association of Schools of Music, but do not believe that we could make any sort of a list such as you propose, to specify twenty selections. I have checked thirty that our average student would know before entrance on our regular course. If the student has been in touch with ------- High School music, or the music of many good high schools in the ------- district, an additional list of thirty pieces could be added quite safely.

I have received your questionnaire and find myself very much interested in your endeavor. But I cannot answer as you request. In the first place, I would have to use all my votes before reaching Liszt's "Les Preludes" (which I would omit). Second, I find I cannot balance four votes for the Peer Gynt or Nut-Cracker Suites against one vote for the slow movement of the Eroica. Third, the mixing of folk-songs and "art music" bothers me. So I cannot be of much use, besides suggesting: 1. Raising of the minimum number of requirements. 2. Equalizing the units of choice in some way. 3. Establishing of genres or categories within which minimum requirements are made (this might solve the problem of suggestion 2). 4. Inclusion of some pre-1600 music (this is not so inaccessible since the publication, on phonograph discs, of representative music from the Mediaeval and Renaissance periods) and some of the leading works of the 20th century -- especially listed on page 3. I have therefore marked only those pieces that I think should certainly be <u>left off</u> any list of this sort.

Your letter of March 11 with enclosure of the questionnaire is received. Students coming to a conservatory for the first time differ so much in the advantages they have previously enjoyed that I seriously question the advisability of holding them to even a minimum standard of recognition tests, but I am happy to check twenty numbers which most students might reasonably be expected to know.

I'm afraid that my judgment would be mere guesswork. I don't know what music a student should be able to recognize before entering as a freshman nor do I see the relevancy of recognition to musical "promise" or worth.

Familiarity with the numbers listed would depend entirely upon students' experience and background. It is unwise to make

any such distinction as you request.

These excerpts contain an interesting cross-section of human response, ranging from generous cooperation through misunderstanding and misreading down to suspicious caution. Of the two principal criticisms that emerge -- that the ability to recognize music is dependent upon background, and that twenty selections are too few -- the first has already been dealt with. In the present expanded form of the test the number of selections was increased to thirty, by adding the ten numbers checked oftenest after the original twenty.

Construction of the Test.- These thirty selections are all presented in the original medium, vocal or instrumental, or a combination of the two. Specifications for recording and other mechanical features have already been noted for the entire battery. This test is not included in Form B. The test blank is contained in Appendix A. The catalog of material for Form A, Test IV, Knowledge of Musical Literature is included in Appendix B. The selections are presented in an order determined by the number of times they were checked (Nos. 1 and 2 excepted, which serve as samples in the test).

Summary

The inclusion of Test IV in the battery is justified by the same reasoning upon which the inclusion of items of general information in intelligence tests is based. The test content was

determined by a jury of music educators, who made the selections from a submitted list based upon the content of four music history and appreciation texts. The thirty selections are presented in their original medium.

CHAPTER VIII

THE VALIDITY OF THE TESTS

The preceding chapters have gone to some length to demonstrate the differences between the acoustic and aesthetic approaches to the problem of measuring musical potentiality, and to point out the advantages of the latter. Considerable space has been devoted to definitive theory, and to the development of a theoretical foundation for the tests constructed. This and the succeeding chapter are devoted respectively to an account of the validity and reliability of the tests, judged from their performance.

Assumptions with Reference to Test Performance.- If the Measures of Musical Background are valid tests, it seems reasonable to assume certain things, indicated as follows:

(1) That scores achieved on the tests will decrease perceptibly down through the levels of musical attainment, experience and maturity. In this study, therefore, the criterion group should achieve the highest scores, and the college music freshmen, college academic students, senior high school, junior high school, and intermediate grade pupils should rank down successively from it.

(2) That scores achieved by musically untrained but musically sensitive individuals will surpass those achieved by musically untrained but musically insensitive individuals.

(3) That scores achieved on entering college by individ-

uals afterwards enjoying successful musical careers will have surpassed those achieved by their contemporaries afterwards failing to enjoy successful musical careers.

Data on the First Assumption.- In order to determine whether or not scores on the tests decreased perceptibly down through the levels of musical attainment, experience, and maturity, mean scores on all tests were calculated for all groups. These, with the numbers involved, are presented in Table III. It will be noted that there is but one exception to the pattern of decrease found everywhere else, -- the junior high school outranks the senior high school on Test III by a small margin. Whether or not this may be ascribed to the imaginativeness of the junior high school pupil is problematical. More probably it is due to the lessened difficulty of Form B. The musical material for both forms of this test is identical, but the responses offered for choice on each item are considerably simplified, making the two forms of Test III only roughly comparable. This difficulty does not exist with respect to Test I and II, as the only difference between the forms lies in the simplified language of the instructions in Form B. The meaning of the instructions is identical, as are the technique, content, and scoring of the test.

The significance of the differences of these means for

TABLE III

NUMBERS AND MEANS FOR ALL GROUPS ON ALL TESTS

	Group	Test I-A		Test I-B		Test II-A		Test II-B		Test III		Test IV	
		N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
Form A	Criterion Group	41	28.29	40	45.03	40	27.03	36	27.89	38	15.95	36	104.25
Form A	Music Freshmen	306	23.33	307	37.50	307	20.76	309	24.14	308	12.86	308	43.10
Form A	Academic College Students	57	21.68	57	33.67	57	18.98	57	22.74	57	12.61	57	35.81
Form A	Senior High School	467	18.08	455	29.82	467	15.25	461	18.83	461	11.83	461	16.94
Form B	Junior High School	453	16.30			444	13.07			441	12.29		
Form B	Intermediate Grades	400	15.08			400	11.87			394	11.46		

four of the groups has been computed by the "t-test."[1] The results are indicated in Table IV. Computations involving the criterion group and the college academic students were not made, not only because of the relatively small number of individuals tested, but because, since they each involved only one relatively homogeneous group, no appropriate techniques are available for determining the reliability of such estimates. It will be observed from the table that nine of the eleven mean differences are highly significant, the other two relatively so.

Predicated upon the substantiation offered by the evidence presented, the first assumption with reference to the validity of the tests is justified.

Data on the Second Assumption.- In order to determine whether or not scores achieved by musically untrained but musically sensitive individuals will surpass those achieved by musically untrained but musically insensitive individuals, the tests were administered to a group of college academic students. The teacher of this group, a general music class, was asked to indicate those members who were definitely musically sensitive, and those who were just as definitely musically insensitive. These two categories numbered eight and nine respectively, leaving a large "middle group" of forty.

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1 $t = \frac{M_1 - M_2}{\text{est'd}\,M_1 - M_2}$ For a full discussion of the t-test in this connection, see E. F. Lindquist, Statistical Analysis in Educational Research, pp. 56-58. Boston: Houghton Mifflin Co., 1940. The basic data for these calculations are included in Appendix G.

TABLE IV

CHANCES IN ONE HUNDRED THAT THE DIFFERENCE BETWEEN TWO MEANS IS THE TRUE DIFFERENCE

Groups compared for mean differences	Test I-A	Test I-B	Test II-A	Test II-B	Test III	Test IV
College Music Freshmen and Senior High School.....	99	99	99	85	99	99
Senior High School and Junior High School*.....	98		95			
Junior High School and Intermediate Grades.....	93		78		92	

* Note that these figures involve comparison of the two forms of the tests; the musical content and scoring is identical, but the wording of the instructions is simplified in Form B.

Their respective achievements are presented in Table V.

It will be observed that, while the ranges overlap occasionally, on no test do the means vary from a descending order from the "sensitive" group through the "middle" group to the "insensitive" group. On every test there is a very marked difference between the means of the "sensitive" and "insensitive" groups. The difference on Test III is numerically small in relation to the others, but it will be recalled that the differences among all other groups were likewise small on this test (Table III). Predicated upon the substantiation offered by the evidence presented, the second assumption with reference to the validity of the tests is justified.

Data on the Third Assumption.- It is, of course, impracticable at present to supply direct evidence that scores achieved on entering college by individuals afterwards enjoying successful musical careers will have surpassed those achieved by their contemporaries afterwards failing to enjoy successful musical careers. Time must elapse before the prognostic value of the tests can be adequately determined. The liklihood of this assumption is established, however, in a study correlative to the present one.[2] Test I of the unrevised edition, the one measure of the battery nearest resembling its present revision, was found to rank second in a group of twenty-two music

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[2] Elizabeth M. Taylor, "A Study in the Prognosis of Musical Talent." Unpublished doctor's thesis, Teachers College, University of Cincinnati, 1941.

TABLE V

HIGH, LOW, AND MEAN SCORES ON ALL TESTS
ACHIEVED BY THREE DIVISIONS OF A GENERAL MUSIC CLASS OF ACADEMIC COLLEGE STUDENTS
RATED FOR MUSICAL SENSITIVITY BY THEIR TEACHER

Division	Test I-A			Test I-B			Test II-A			Test II-B			Test III			Test IV		
	High	Mean	Low	High	Mean	Low	High	Mean	Low	High	Mean	Low	High	Mean	Low	High	Mean	Low
Musically sensitive group N = 8.....	30	27.75	25	50	40.63	29	28	23.50	20	30	24.63	19	19	14.00	10	98	56.75	30
Middle group N = 40.....	28	21.18	13	47	33.18	22	25	18.98	14	29	23.30	18	16	12.40	7	71	35.48	12
Musically insensitive group N = 9.....	26	18.56	13	43	29.67	25	20	15.00	3	23	19.00	12	15	12.33	10	30	18.67	11

tests for the prediction of professional success after college. The derived coefficient of contingency for this test was .611, as against that of .619 for the first ranking test. (The maximum coefficient for this calculation would be .894).

Summary

The present chapter embraces an account of the validity of the Measures of Musical Background, based upon their performance.

The tests were administered to a criterion group composed of college faculty members and symphony orchestra musicians, and the high scores achieved on the tests by this group of expert musicians embody the first claim for the validity of the battery.

The tests were further administered to approximately three hundred college music freshmen, fifty-seven college academic students, and twelve hundred public school students, grades four to twelve inclusive. The mean scores of these groups -- college, senior high school, junior high school, intermediate grades -- were found to decrease consistently according to level of musical attainment, experience, and maturity. The differences between these means were found to be highly reliable. These mean differences embody the second claim for the validity of the tests.

Mean scores achieved by musically sensitive, musically insensitive, and intermediate groups, as designated by the teacher of a general music class in a teachers college, were found to decrease on all tests according to the designated ability of the group,

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[3] Henry E. Garrett, Statistics in Psychology and Education, p. 390. New York: Longmans, Green and Co., 1937.

there being an especially marked difference between the groups described as musically sensitive and musically insensitive. This forms the third claim for the validity of the tests.

In essence, the validation of the measures is based upon the contention that musical individuals will achieve high scores upon them, and that unmusical individuals will not, thus opening the way for positive prognosis. On the face of the evidence presented, the tests measure what they purport to measure.

CHAPTER IX

RELIABILITY OF THE TESTS

The present chapter embraces a brief review of the general theory of reliability, and a statement of the reliabilities of certain standardized music tests. It estimates the reliability of the Measures of Musical Background, and discusses certain suggestions for its improvement in three of the tests.

The Theory of Reliability.- Statements of the reliability of a measure are always in terms of its approximation to the true measure. This was indicated in Table IV, in which the probability for divergence of computed mean differences from the "true" mean differences is stated. Such "true" measures are derived theoretically, rather than empirically.[1] The reliability of a test is dependent upon the stability and consistency of its performance.[2] If it repeatedly measures the same phenomena in the same way, that is, if the discrepancies on such repeated measurements are small, the test is reliable. A numerical statement of reliability may be obtained by correlating first scores with those

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[1] See Henry E. Garrett, Statistics in Psychology and Education, Chap. VIII, on this point. New York: Longmans, Green and Co., 1937.

[2] Ibid., pp. 311-15

achieved on repetition of the test. Or the test may be given once and broken into equal halves, usually by placing the odd numbered items in one half and the even numbered items in the other, and the scores on these halves correlated. Or the scores on two parallel forms of a test, if they exist, may be correlated. The first two techniques have been employed in estimating the reliability of the Measures of Musical Background. It was not possible to employ the third, as the two forms of the test are not parallel.

The Reliability of Published Music Tests.- Mursell[3] presents reliability coefficients for the Seashore tests from some nineteen investigations. Coefficients on Sense of Pitch range from .40 to .90; on Sense of Intensity from .40 to.94; on Sense of Time from .41 to .80; on Sense of Consonance from .26 to .68; on Sense of Rhythm from .28 to .64; on Tonal Memory from .59 to .90. Whitley[4] reports an investigation involving some eight hundred individuals. Self correlations on the Seashore tests ranged from .667 to .893; on the Kwalwasser-Dykema tests from .219 to .830, with the tests other than those marking the extremes of

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3 James L. Mursell, The Psychology of Music, p. 292. New York: W. W. Norton and Co., Inc., 1937.

4 M. T. Whitley, "A Comparison of the Seashore and Kwalwasser-Dykema Tests," Teachers College Record, XXXIII (May, 1933), 731-51.

the range falling from .388 to .550. Seashore[5] reports reliability coefficients for the revised version of his battery as ranging from .62 to .89, those for Pitch extending from .78 to .88, for Loudness from .79 to .88, for Time from .70 to .76, for Timbre from .69 to .77, for Rhythm from .62 to .73, for Tonal Memory from .84 to .89. It is thus evident that standardized, recorded tests of musical talent have not achieved the reliability possessed by psychological measures in other fields.

Reliability of the Measures of Musical Background.- Two separate and independent estimates were made of the reliability of each of the tests. The first estimate was obtained by applying the Spearman-Brown prophecy formula to the correlation between the scores on the odd-numbered items and those on the even-numbered items of the test papers of one hundred college music freshmen, these papers being selected at random and in equal proportions from each of the colleges cooperating with the present study. A second estimate was secured by correlating the scores achieved by sixteen college music freshmen (of the school year 1939-40) on the tests on two occasions (May 17, 1940, and September 23, 1940).

The reliability coefficients obtained by each of these methods are presented in Table VI. Three of the tests, I-A

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[5] Joseph G. Saetveit, Don Lewis, and Carl E. Seashore, Revision of the Seashore Measures of Musical Talents, p. 34. University of Iowa Studies, Series on Aims and Progress of Research, No. 65. Iowa City, Ia.: University of Iowa Press, 1940.

TABLE VI

ESTIMATED RELIABILITY COEFFICIENTS
OBTAINED FOR EACH OF THE TESTS
BY EACH OF TWO METHODS

Test	"Split-halves"		"Repeat Group"	
	r_x	PE_r	r_x	PE_r
Test I-A.....	.829	.039	.721	.081
Test I-B.....	.908	.012	.893	.034
Test II-A.....	.429	.077	.560	.116
Test II-B.....	.521	.065	.430	.137
Test III.....	.233	.103	.578	.112
Test IV.....	.858	.019	.804	.060

Recognition of Tonality, Melodies), I-B (Recognition of Tonality, Chords), and IV (Knowledge of Musical Literature) make a very satisfactory showing, in consideration of the fact that they are sections of an experimental battery, subject to all of the chances and mischances which are the share of any first effort.

Of the three tests having lower coefficients several things may be said. They are still as reliable as most music tests, and it seems probable that changes in certain respects will considerably increase their reliability. Some of these changes will be discussed at greater length in Chapter X, but may be mentioned now in passing. First of all, the recording on Tests II and III left a great deal to be desired. It is probable also that it would be easier to sustain a higher level of interest with a shorter test, the present battery requiring an hour and a half to administer.

Specific Comment on Test II-A (Rhythmic Discrimination, Meter).- There are considerations aside from these, however, which are more intrinsic to the tests. On Test II-A some high school students took the instructions to mean that all items counted by three or four, since the two examples did (items 1 and 2). The greatest difficulty with Test II-A, however, lay in the seeming impossibility of discriminating between two and four beat measures, and between three and six beat measures. As previously noted, most items counting by six were marked three by the majority of the criterion group, and the same un-

certainty existed with respect to two and four. When so many highly trained and experienced musicians are confused it is difficult to stand arbitrarily by the composer's notation. In fact, some selections could just as well be written one way as the other. Some individuals also gave the meter signature, the upper figure of which was correct, but did not state the number of beats in a measure, thus creating confusion in scoring.

Probably the most practical solution of the difficulty would be to include in the test only such materials as would permit the use of two, three, or their multiples as acceptable answers. Substantial support for this procedure is offered by an experiment conducted with the present test. The scores on five items counting by two and five items counting by three were correlated. The first set of five contained three items counting by two, and two items counting by three; the second set contained three items counting by three and two items counting by two. The obtained coefficient, raised by the Spearman-Brown formula to represent a test containing thirty items, was .586 $\pm$ .067. As the coefficient for the test in its present form was .429 $\pm$ .077 (split-halves), it seems very probable that the test can be made to show very satisfactory reliability upon proper revision.

Finally, it must be noted that to date the reliability of no rhythm test has been exceedingly high. Mursell's table,

already quoted, lists the reliability coefficients of the Seashore rhythm test from .28 to .64. As indicated above, coefficients for the rhythm test of the new Seashore battery range from .62 to .73. Whitley, also previously quoted, lists the reliability of the K-D rhythm test at .428.

Specific Comment on Test II-B (Rhythmic Discrimination, Tempo).- The principal difficulty with this test has been touched upon in Chapter III: the selections are probably too long for their purpose, and a chance rubato may be taken for a deliberate accelerando or ritardando. Material for this test, therefore, should probably not only comprise shorter items, but music of a consistently marked rhythmic character. The difficulty lies in achieving gradual accelerandi and ritardandi ranging from fair breadth to near imperceptibility.

Specific Comment on Test III (Dramatic Feeling).- In judging the reliability of this test three things must be noted: (1) that it is the first test to employ the particular technique involved; (2) that we have no figures on the reliability of comparable tests; and (3) that there is a curious discrepancy between the reliability on the test as estimated by the split-halves method and that estimated by using the scores from two administrations of the test to the same group. Basing opinion on the figure obtained by the latter technique, it is reasonable to believe that certain adjustments in the direction of coarser discriminations among the responses offered for choice on some

items would increase the test's reliability by a satisfactory amount.

Test III has been criticized by some members of the criterion group on the ground that its very nature prevents it from achieving reliability. This is possible, but not for the reasons that critics have suggested. It is contended that music has no meaning; or, if it has, it will not mean the same thing to all people. The first statement is a fallacy, as will presently be shown. The second is partially true, but not strictly or solely applicable to a test of dramatic feeling in music.

The point the critics miss is that words are not things or symbols for things, but symbols or vehicles for ideas or feelings about things. It is only when a thinker makes use of words that they have meaning. They have a referential use, which is reflective and intellectual, and an emotive one, which is primitive and promotional of purposes,[6] as in literature or poetry. The meaning of words is often misunderstood -- "words, when they cannot directly ally themselves with and support themselves upon gestures are at present a very imperfect means of

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[6] This analysis is based upon a longer one in C. K. Ogden and I. A. Richards, The Meaning of Meaning, Chap. I. New York: Harcourt, Brace and Co., 1930.

communication."[7] Gestures are another vehicle for ideas or feelings, mathematical symbols another for ideas, music another for both. And while music may not contain the same meaning for all people, neither do words. The difficulty, therefore, does not lie in the meaning of music, but in translating that meaning into words, in transferring from one symbolism to another, in the changing of vehicles.

The difficulty of knowing in the first place what the composer meant was surmounted in the present test by using music written for opera, music built around specific scenes or actions or feelings. No doubt some of the one-line descriptions contained in the test are inadequate; possibly some of the music is poorly chosen. But the real problem, the problem of knowing how fine verbal discriminations can be and yet support transfer from the symbolism of music can be determined only by experiment, and Test III is just such an experiment. It is unfortunate that the only means we have discovered thus far for measuring the capacity of dramatic feeling for music involves this complication, but at present there seems no other way out. Young children and ballet dancers translate the symbolism of music into the symbolism of gesture, but this does not lend itself to the restrictions of standardized testing.

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[7] Ibid., p. 15.

Specific Comment on Test IV.- There is little to add with respect to this measure. Probably it could be shortened without materially affecting its reliability, since it is a straightforward test of information. Elimination of some of the more difficult items might even raise the coefficient calculated from split halves. It should be noted that in the repeat group (Table V) scores were sixteen per cent higher on the second testing.

Summary

The present chapter has defined the reliability of measures as the degree of approximation to corresponding true measures, and set forth the techniques whereby statements of the reliability of the Measures of Musical Background were estimated. By way of orientation, it has indicated that the reliabilities of extant music tests (for talent) are generally low. Specific comments were offered pertaining to the reliability of each test of the battery with which the present study is concerned. Tests I-A, I-B, and IV are satisfactorily high; tests II-A, II-B, are somewhat lower, but means of improving them were indicated. The reliability of Test III is low. The theory of the test was defended, and evidence presented substantiating certain means for its improvement. The ensuing chapter is concerned with specific suggestions for the revision of the battery.

CHAPTER X

SUGGESTIONS FOR REVISION OF THE MEASURES OF MUSICAL BACKGROUND

Despite the most meticulous precautions, every possible contingency cannot be anticipated: situations arise in experience which could not have been foreseen. The following remarks are intended to indicate certain alterations in the battery which appear desirable after experience in its use. Subsequent paragraphs summarize certain suggestions which should be considered in formulating a revision.

General Suggestions.- First of all, the tests should be printed on paper which will produce a minimum amount of noise in handling. In administering the tests to a large group of people, the paper used in the experimental edition rattled considerably with the turning of pages. The items on the page should also be so arranged that pages will be turned at the end of a phonograph record.

Second, the recording of the instrumental numbers could have been considerably better. This is not meant to detract from the work of the technician who made the recordings, for it was as good as restricted resources, time, and facilities would permit. The vocal recordings were not perfect, but satisfactory. It is the writer's conviction, however, that the reliability of

some of the tests -- Test III in particular -- was seriously affected by the quality of the instrumental recording. The tests deserved something better than acetate recordings.

Third, the tests would maintain a higher level of interest if they were somewhat shorter. They should not, however, be shortened at the expense of reliability. A briefer test would be especially helpful in testing public school groups. Probably some of the slower moving and more time consuming items could be eliminated.

Fourth, it might prove desirable to alter the order of the tests. If Test III (Dramatic Feeling) were first in the battery, confidence might be created in musically unsophisticated individuals who would be dismayed by the appearance and nomenclature of Test I (Recognition of Tonality). Based on this reasoning, a suggested order is III (Dramatic Feeling), II (Rhythmic Discrimination), I (Recognition of Tonality), IV (Knowledge of Musical Literature).

Finally, the words "beginning with No. 3" found in the directions preceding each test will have to be altered. Public school students in particular too often interpret them to mean that the test begins with item No. 3, and start marking in answers for the two examples.

Suggestions for Test I-A, Recognition of Tonality, Melodies.- Excepting as the test is affected by the above general suggestions, no further alteration seems desirable.

Suggestions for Test I-B, Recognition of Tonality, Chords.- Despite its excellent showing, there remains one serious difficulty with this test over and beyond the general criticisms noted above. After attempting to record the chords from pipe organ and electric organ, a recording from piano was finally used. This, too, was unsatisfactory, because of the waver in the recorded piano tone, and because sometimes one tone of a triad would be weaker than the other two. The problem is a technical rather than a musical one, and further experimentation should be conducted to settle upon a more satisfactory medium. As it requires only the two faces of a twelve inch disc -- approximately eight minutes -- this test probably should not be shortened.

Suggestions for Test II-A, Rhythmic Discrimination, Meter.- Alterations for this test have been outlined already in the discussion of its reliability. It will be recalled that these involve revision of content so that all items will require answers of two, three, or their multiples. This procedure will not permit as adequate a measure as the present test, but it probably will prove much more reliable and practical.

Suggestions for Test II-B, Rhythmic Discrimination, Tempo.- Changes for this test have also been discussed in connection with its reliability. This test makes serious demands upon the musicianship of the recording group, and sometimes arouses vigorous protest from those who can detect no change in the test items which is allegedly present. If, however, the musical problem can be

overcome by the use of a recording group of sufficient skill, the test seems eminently worthwhile.

Suggestions for Test III, Dramatic Feeling.- Difficulties with this measure, centering about the transfer of meaning, have been discussed at some length in Chapter IX. In addition to the alterations already indicated, the character of the first item (example) should be changed. The combination of "A sweet, sad tale" with the music of La Traviata has proved an unfailing stimulant to the risibilities of high school students. The second example, "Evening in the garden," to the music of Mignon, is also weak. Proper alteration of the descriptions seems to be the principal problem remaining.

Suggestions for Test IV, Knowledge of Musical Literature.- It is quite probable that this test could safely be shortened. There were a few, but very few, near-perfect papers among the college music freshmen, and the general level was relatively low (mean = 43.10, maximum score = 120). A shorter test would be much less boring to most high school students. The excerpts are intentionally long, to permit sufficient time for writing titles and composers' names, so that the average high school student, who was acquainted with some fourteen per cent of the material, had much more opportunity to lose interest than was desirable.

Evidence of General Merit.- Comments by faculty members

of colleges visited in the testing program were on the whole quite favorable, though most of the criticisms noted in the preceding paragraphs were made by one or more individuals. Approval was especially marked toward the general form of the test, and toward certain specific features, such as both verbal and visual presentation of directions, the detachable record sheet which acts as a front cover to the test booklet, and the two examples given for each test technique.

Several additional observations, derived from experience with the battery, may be made concerning the merits of its general character. First, it is easy to administer. Second, interest, especially among college students, was high, and there was no evidence of strain at any time. Finally, it will sustain considerable abuse. Temporary distractions that would prove ruinous to a delicate sensory test have little effect on these tests, because of the length of the items, and the fact that they are concerned principally with perceptual organization rather than sensory discrimination. Briefly, they are much more foolproof than most music tests.

Summary

Based upon evidence obtained from the experimental edition, general suggestions for the alteration of the battery include improved recording, decreased length, rearrangement of

the order of the tests, and changes in various individual items. Specific suggestions embrace an improved medium for Test I-B, the adoption of a basic two-three formula for Test II-A, the elimination of rubati in the recording of Test II-B, and adjustment to coarser discriminations in the descriptive material of Test III. It is recommended that the general form of the battery and test blank be retained.

CHAPTER XI

GENERAL SUMMARY AND CONCLUSIONS

Summary

Introduction.- The problem of the present study may be described as the construction and validation, on the basis of aesthetic theory, certain measures of musical potentiality. These tests, known as the Measures of Musical Background, have been developed from a battery previously devised at the College of Music of Cincinnati. They measure tonal, rhythmic, and emotional factors in music, and acquaintance with musical literature.

Theoretical Foundations.- In establishing a theoretical base for the battery, it is held that the origin of aesthetic feeling lies in central relations between sensation and judgment. Though aesthetics is a normative discipline rather than an "exact" science, it has its laws, which are derived by analysis of directly apprehended phenomena rather than by penetration beneath the sensory surface. Experiment is just as possible in art as in science, the difference being one of materials and means. Efforts to base a science of aesthetics upon the physics of formalism ignore the connotative element in art, and hence are inadequate. The Seashore Measures of Musical Talent are not only founded upon

a concept of atomistic formalism, but are also unsatisfactory because, as purely sensory tests they are concerned with auditory rather than musical capacities, and have but negative prognostic value.

An alternative experimental technique is proposed which is founded upon aesthetic analysis involving natural basic orders of perception fundamental to the relations between sensation and judgment.

Construction of the Battery.- The title of the Measures of Musical Background defines their function, which is the measurement of musical status as an index of potentiality. Form A of the battery, intended for use in senior high school and college, comprises four tests, two of which are subdivided: Test I-A, Recognition of Tonality, Melodies; Test I-B, Recognition of Tonality, Chords; Test II-A, Rhythmic Discrimination, Meter; Test II-B, Rhythmic Discrimination, Tempo; Test III, Dramatic Feeling; Test IV, Knowledge of Musical Literature. Form B, intended for use in the junior high school and intermediate grades, comprises three tests; Test I, Major and Minor; Test II, Counting; Test III, Stories and Pictures. The materials and scoring of Tests I, II, and III of Form B are identical with those of Tests I-A, II-A, and III of Form A respectively. Appropriate test blanks were constructed and printed, and both forms of the test were recorded. The battery was administered to a criterion

group of forty-two symphony orchestra and college music faculty members (on whose performance the scoring key was based), approximately three hundred college music freshmen, fourteen hundred public school pupils, grades four through twelve, and fifty-seven college academic students in thirteen colleges and six public schools. Percentile ranks were computed for college music freshmen, senior high school, junior high school, and intermediate grades.

Test I: Recognition of Tonality.- Tonality is defined as feeling for key, and the characteristics and relations of the modes were discussed. The ability to recognize major and minor tonalities was selected as the capacity to be measured in indication of potentiality in the tonal area because major and minor scales are the aesthetic pattern fundamental to the tonal element of music. Section A, Form A, of the test presents melodies for modal identification; Section B, chords.

Test II: Rhythmic Discrimination.- Theories of rhythm and its perception are not in agreement, and the relationships of meter, tempo, takt, time, form, and rhythm are often confused. For this study, rhythm is defined as consistent periodicity of relative stress. Section A (Meter), Form A, of the test presents material for the identification of rhythmic pattern -- the number of stresses or beats in a measure; Section B (Tempo), measures ability to detect inconstancy in the pace of the pattern of stresses in presented materials.

Test III: Dramatic Feeling.- There are several theories relative to the genesis of emotion. The character of aesthetic emotion is contrasted with that of practical emotion: aesthetic emotion grows out of contemplation; when it overflows into behavior it becomes practical. Various attempts at the measurement of aesthetic emotion were recounted, and the fact that emotion can be a source of knowledge indicated -- art may possess meaning. Test III attempts to circumvent the inherent difficulty of defining artistic meaning by presenting operatic excerpts which were written to express a given meaning. It requires the identification of this meaning through the indication of which one of four (three in Form B) one-line descriptions presented for each selection best describes the dramatic content of that selection.

Test IV: Knowledge of Musical Literature.- Thirty compositions were selected by a jury of forty college music faculty members as desirable for identification by college music freshmen. The test is justified on the same grounds upon which items of general information are included in intelligence tests. Just as possession of certain information in some degree is a characteristic of intelligence, knowledge of musical literature is a mark of the musician.

The Validity of the Tests.- The validation of the Measures of Musical Background is based upon the contention that musical individuals will achieve high scores on them, and that unmusical ones will not. This contention is substantiated by the fact that

mean scores (the differences of which were found to be statistically significant) on the tests decrease consistently down through the levels of musical attainment, experience, and maturity, from the criterion group to the intermediate grades. It is further substantiated by the fact that mean scores achieved by musically sensitive, musically insensitive, and intermediate groups, as designated by the teacher of a general music class in a teachers college, are found to decrease on all tests according to the designated ability of the groups, there being especially marked differences between the groups described as musically sensitive and musically insensitive.

The Reliability of the Tests.- The reliability of the battery was estimated by applying the Spearman-Brown prophecy formula to the correlation between scores on odd-numbered and even-numbered items of the test papers of one hundred college music freshmen. It was further estimated by correlating scores achieved by sixteen college music freshmen on the tests on two occasions. The coefficients for Tests I-A, I-B, and IV are satisfactorily high. Tests II-A and II-B are somewhat lower in estimated reliability, and Test III is lower still. (Alterations for the improvement of reliability are noted in the discussion of revision.) The estimated reliability of all music tests concerned with talent and prognosis is generally low.

Suggestions for Revision of the Battery.- Based upon experience with the present edition, general suggestions for the alteration and improvement of the battery may be summarized as improved recording, decreased length, and rearrangement of the order of the tests (III, II, I, IV). Specific suggestions embrace an improved medium for Test I-B, the adoption of a basic two-three formula for Test II-A, the elimination of rubati in Test II-B, and adjustment to coarser discriminations in the descriptive material in Test III. The general form of the battery and test blank should be retained.

Conclusions

On the basis of the study summarized, the following conclusions seem tenable:

(1) It has been demonstrated both theoretically and empirically that the aesthetic approach to the measurement of musical potentiality is not only defensible but highly promising.

(2) The battery of tests constructed upon the basis of this theory, known as the Measures of Musical Background, has been shown to be highly valid.

(3) Three tests of this battery have been shown to be highly reliable; two of the remaining three very probably can be so revised as to perform reliably; the remaining one possibly can be so revised.

(4) Tests of this character have three distinct advantages

over sensory tests: (a) they are easier to administer because of higher interest and lower sensitivity to abuse; (b) they recognize training instead of seeking to isolate "pure" talent traits; (c) they make for positive rather than negative prognosis.

(5) The tonal function in music, long recognized as the most important, is the easiest to measure.

(6) The difficulty encountered in measuring the rhythmic function in music is due to confused interpretations of rhythm rather than its intrinsic nature.

(7) The emotional function in music is the most difficult to measure, due to certain inherent psychological complexities.

(8) Knowledge of good musical literature is below a desirable level, both in college and in high school.

(9) The showing of the Measures of Musical Background justifies their continued development.

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APPENDIX A

FORM A

N 913

Measures of Musical Background

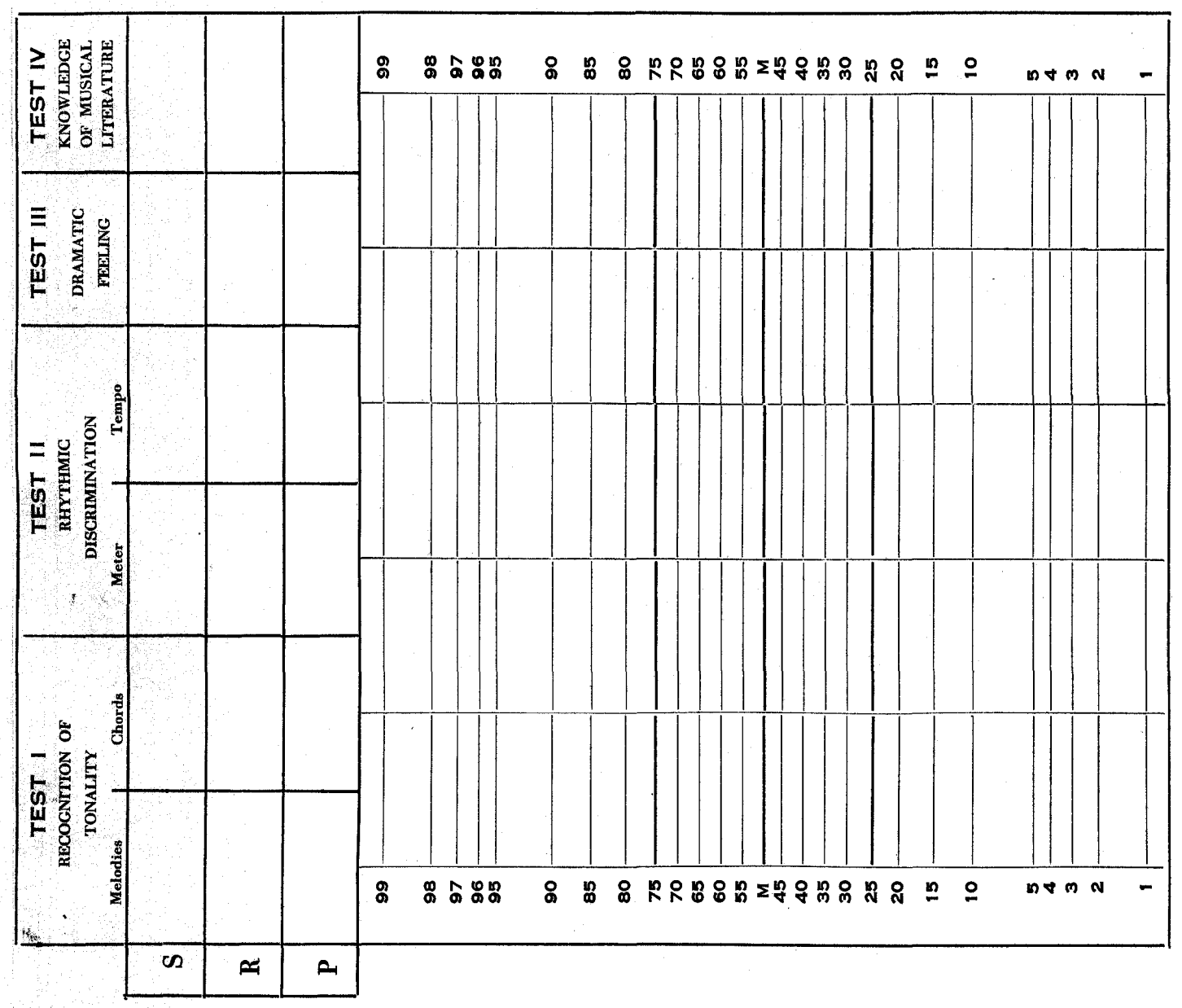
Originated by Corwin H. Taylor
College of Music of Cincinnati

Write in the information called for on these blanks before beginning the tests.

NAME..... DATE.....

CLASS..... INSTITUTION.....

DO NOT WRITE BELOW THIS LINE



TEST I

RECOGNITION OF TONALITY

SECTION A, MELODIES

913			
N	S	R	P

DIRECTIONS: In this test thirty-two melodies will be sung or played, some with and some without accompaniment. Some of these melodies are in major keys, others are in minor keys. If in your judgment the melody is in a major key, place a cross opposite the word MAJOR in the proper space below; if in a minor key, place a cross opposite the word MINOR. The correct answer for No. 1 is MAJOR, for No. 2, MINOR. Beginning with No. 3 you are to mark in your own opinions.

1 MAJOR X	9 MAJOR	17 MAJOR	25 MAJOR
MINOR	MINOR	MINOR	MINOR
2 MAJOR	10 MAJOR	18 MAJOR	26 MAJOR
MINOR X	MINOR	MINOR	MINOR
3 MAJOR	11 MAJOR	19 MAJOR	27 MAJOR
MINOR	MINOR	MINOR	MINOR
4 MAJOR	12 MAJOR	20 MAJOR	28 MAJOR
MINOR	MINOR	MINOR	MINOR
5 MAJOR	13 MAJOR	21 MAJOR	29 MAJOR
MINOR	MINOR	MINOR	MINOR
6 MAJOR	14 MAJOR	22 MAJOR	30 MAJOR
MINOR	MINOR	MINOR	MINOR
7 MAJOR	15 MAJOR	23 MAJOR	31 MAJOR
MINOR	MINOR	MINOR	MINOR
8 MAJOR	16 MAJOR	24 MAJOR	32 MAJOR
MINOR	MINOR	MINOR	MINOR

SECTION B, CHORDS

N	S	R	P
913			

DIRECTIONS: In this test fifty-two chords will be played. Some will be major chords, some minor. If in your judgment the chord is a major one, place a cross opposite the word MAJOR in the proper space below; if a minor one, place a cross opposite the word MINOR. The correct answer for No. 1 is MAJOR, for No. 2, MINOR. Beginning with No. 3 you are to mark in your own opinions.

1 MAJOR X	14 MAJOR	27 MAJOR	40 MAJOR
MINOR	MINOR	MINOR	MINOR
2 MAJOR	15 MAJOR	28 MAJOR	41 MAJOR
MINOR X	MINOR	MINOR	MINOR
3 MAJOR	16 MAJOR	29 MAJOR	42 MAJOR
MINOR	MINOR	MINOR	MINOR
4 MAJOR	17 MAJOR	30 MAJOR	43 MAJOR
MINOR	MINOR	MINOR	MINOR
5 MAJOR	18 MAJOR	31 MAJOR	44 MAJOR
MINOR	MINOR	MINOR	MINOR
6 MAJOR	19 MAJOR	32 MAJOR	45 MAJOR
MINOR	MINOR	MINOR	MINOR
7 MAJOR	20 MAJOR	33 MAJOR	46 MAJOR
MINOR	MINOR	MINOR	MINOR
8 MAJOR	21 MAJOR	34 MAJOR	47 MAJOR
MINOR	MINOR	MINOR	MINOR
9 MAJOR	22 MAJOR	35 MAJOR	48 MAJOR
MINOR	MINOR	MINOR	MINOR
10 MAJOR	23 MAJOR	36 MAJOR	49 MAJOR
MINOR	MINOR	MINOR	MINOR
11 MAJOR	24 MAJOR	37 MAJOR	50 MAJOR
MINOR	MINOR	MINOR	MINOR
12 MAJOR	25 MAJOR	38 MAJOR	51 MAJOR
MINOR	MINOR	MINOR	MINOR
13 MAJOR	26 MAJOR	39 MAJOR	52 MAJOR
MINOR	MINOR	MINOR	MINOR

TEST II

RHYTHMIC DISCRIMINATION

SECTION A, METER

913			
N	S	R	P

DIRECTIONS: In this test thirty-two musical selections will be sung or played. In the proper space below you are to write the meter of each selection—the number of beats in a measure. The correct answer for No. 1 is 3, for No. 2, 4. Beginning with No. 3 you are to mark in your own opinions.

1 3	9	17	25 .....
2 4	10	18	26 .....
3	11	19	27 .....
4	12	20	28 .....
5	13	21	29 .....
6	14	22	30 .....
7	15	23	31 .....
8	16	24	32 .....

913			
N	S	R	P

SECTION B, TEMPO

DIRECTIONS: In this test thirty-two musical selections will be sung or played. In some the rate of speed will increase, in some it will decrease, and in some it will not change. If in your judgement the speed increases, place a cross opposite the word FASTER in the proper space below; if the speed decreases, place a cross opposite the word SLOWER; if it makes no change, place a cross opposite the word CONSTANT. The correct answer for No. 1 is FASTER, for No. 2, SLOWER. Beginning with No. 3 you are to mark in your own opinions.

1 SLOWER	9 SLOWER	17 SLOWER	25 SLOWER
FASTER X	FASTER	FASTER	FASTER
CONSTANT	CONSTANT	CONSTANT	CONSTANT
2 SLOWER X	10 SLOWER	18 SLOWER	26 SLOWER
FASTER	FASTER	FASTER	FASTER
CONSTANT	CONSTANT	CONSTANT	CONSTANT
3 SLOWER	11 SLOWER	19 SLOWER	27 SLOWER
FASTER	FASTER	FASTER	FASTER
CONSTANT	CONSTANT	CONSTANT	CONSTANT
4 SLOWER	12 SLOWER	20 SLOWER	28 SLOWER
FASTER	FASTER	FASTER	FASTER
CONSTANT	CONSTANT	CONSTANT	CONSTANT
5 SLOWER	13 SLOWER	21 SLOWER	29 SLOWER
FASTER	FASTER	FASTER	FASTER
CONSTANT	CONSTANT	CONSTANT	CONSTANT
6 SLOWER	14 SLOWER	22 SLOWER	30 SLOWER
FASTER	FASTER	FASTER	FASTER
CONSTANT	CONSTANT	CONSTANT	CONSTANT
7 SLOWER	15 SLOWER	23 SLOWER	31 SLOWER
FASTER	FASTER	FASTER	FASTER
CONSTANT	CONSTANT	CONSTANT	CONSTANT
8 SLOWER	16 SLOWER	24 SLOWER	32 SLOWER
FASTER	FASTER	FASTER	FASTER
CONSTANT	CONSTANT	CONSTANT	CONSTANT

TEST III

DRAMATIC FEELING

913			
N	S	R	P

DIRECTIONS: In this test twenty-two musical selections will be played, each describing a particular mood, person, scene or situation. You are to place a cross opposite the one phrase in the proper set of four which best describes the dramatic content of each selection. The correct answer for No. 1 is A SWEET, SAD TALE, for No. 2, EVENING IN THE GARDEN. Beginning with No. 3 you are to mark in your own opinions.

1 X A sweet, sad tale
..... A hero's death
..... Gypsy romance
..... The sea rover

2 ..... Glory of the sunrise
..... Conqueror's return
X Evening in the garden
..... Winter landscape

3 ..... Foreboding of tragedy
..... Imperial procession
..... Mysterious stranger
..... Peasant wedding party

4 ..... Sorrow at parting
..... Children's games
..... Festivities at the fair
..... Witches frolic

5 ..... First love
..... Storm in the night
..... An old tale of mystery
..... The jolly friar

6 ..... Hour of the angelus
..... The Russian steppes
..... A prayer to Allah
..... The princess royal

7 ..... Grief at parting
..... Mountain dance
..... Sentimental memory
..... Tortured prisoner

8 ..... Cutting wind and drifting snow
..... Thunder storm on a murderous night
..... Pursuit of a fugitive
..... A grim and rockbound coast

9 ..... Love's ecstasy
..... Forest murmurs
..... Herald of peace
..... Friends' reunion

10 ..... Reverent prayer
..... Melancholy twilight
..... Desert caravan
..... The slave ship

11 ..... The restless tramp of soldier's feet
..... Tumultous heart 'twixt hope and fear
..... Vision of death without salvation
..... Echoes of the battles din

12 ..... Prayer for a sweetheart's safe return
..... Arrival of knights in courtly array
..... Longing for the homeland far away
..... Safe haven from storm at sea

13 ..... The fervor of religious zeal
..... Fear of hidden shapes and shadows
..... The despair of the condemned
..... The melancholy of solitude

14 ..... Grenadiers on dress parade
..... Oriental market, hot and busy
..... The seat of judgment, austere and grave
..... The ducal court, brilliant and gay

NOW TURN THE PAGE

N 913

15 ..... A prayer of peace for friends departed
..... Sweet longing for the days of yore
..... Vision of eternity on departing this world
..... Greetings to a bright new day

16 ..... Love's tender serenade
..... Ascent to the scaffold
..... Flight of the gull
..... Compassionate letter

17 ..... Autumn skies
..... Midnight adventure
..... Sinister threat
..... Gypsies gay

18 ..... Lads and lassies, happy and free
..... The romantic gondolier
..... Drinking bout in the tavern
..... The forest in autumn

19 ..... The presence of the shadow of death
..... Funeral of a Viking chief
..... Calm sea and setting sun
..... The humble, patient, serving man

20 ..... Early morn on a gala day
..... Sad farewell to earthly joys
..... Hysterical fear as disaster strikes
..... The assassin craftily stalks his man

21 ..... Hush before the thunder storm
..... Calm of the mountains at dusk
..... Quiet of a deserted village
..... Gloom of an ancient castle

22 ..... Childish grief for a broken toy
..... Frenzied anguish of a tortured soul
..... Sullen anger of men deceived
..... Desperate plea of a discarded lover

TEST IV

KNOWLEDGE OF MUSICAL LITERATURE

913			
N	S	R	P

DIRECTIONS: In this test thirty-two musical selections will be sung or played. You are to write in the proper space below what to the best of your memory is the name of each selection, and the name of its composer or source. If the selection is taken from an opera, oratorio, suite, or symphony, be sure to state the fact. The correct answer for No. 1 is "SOLDIERS CHORUS" FROM FAUST BY GOUNOD, for No. 2, JUANITA, SPANISH. Beginning with No. 3 you are to write in your own opinions.

1.	"Soldiers Chorus" from Faust	Gounod
2.	Juanita	Spanish
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		

NOW TURN THE PAGE

FORM A

N	913

14. .....

15. .....

16. .....

17. .....

18. .....

19. .....

20. .....

21. .....

22. .....

23. .....

24. .....

25. .....

26. .....

27. .....

28. .....

29. .....

30. .....

31. .....

32. .....

ORM B

N | 39

Measures of Musical Background

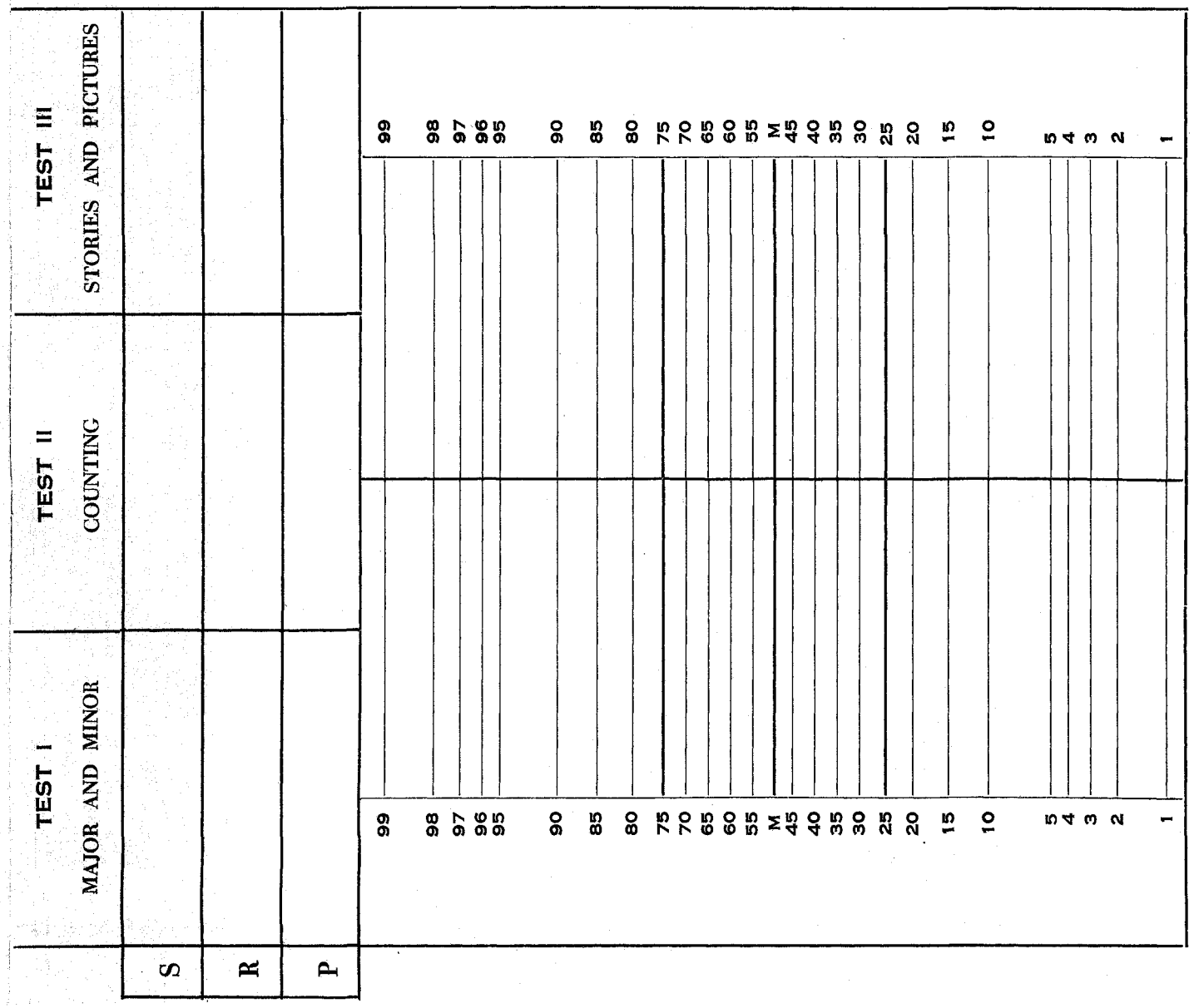
Originated by Corwin H. Taylor
College of Music of Cincinnati

Fill in these blanks before beginning the tests.

NAME..... DATE.....

CLASS..... SCHOOL.....

DO NOT WRITE BELOW THIS LINE



TEST I

MAJOR AND MINOR

39			
N	S	R	P

DIRECTIONS: As you know, all music is in either a major or a minor key. A piece of music will now be sung or played for each of the thirty-two sets of the words MAJOR and MINOR below. If you think a piece is in a major key, place a cross by the word MAJOR; if in a minor key, place a cross by the word MINOR. Just to remind you how major and minor sound, the correct answers for No. 1 and No. 2 are marked in. Begin ning with No. 3 you are to mark in your own opinions.

1 MAJOR X	9 MAJOR	17 MAJOR	25 MAJOR
MINOR	MINOR	MINOR	MINOR
2 MAJOR	10 MAJOR	18 MAJOR	26 MAJOR
MINOR X	MINOR	MINOR	MINOR
3 MAJOR	11 MAJOR	19 MAJOR	27 MAJOR
MINOR	MINOR	MINOR	MINOR
4 MAJOR	12 MAJOR	20 MAJOR	28 MAJOR
MINOR	MINOR	MINOR	MINOR
5 MAJOR	13 MAJOR	21 MAJOR	29 MAJOR
MINOR	MINOR	MINOR	MINOR
6 MAJOR	14 MAJOR	22 MAJOR	30 MAJOR
MINOR	MINOR	MINOR	MINOR
7 MAJOR	15 MAJOR	23 MAJOR	31 MAJOR
MINOR	MINOR	MINOR	MINOR
8 MAJOR	16 MAJOR	24 MAJOR	32 MAJOR
MINOR	MINOR	MINOR	MINOR

TEST II

COUNTING

39			
N	S	R	P

DIRECTIONS: Of course you have noticed that all music counts by two or three, or four, or perhaps even five or six. In printed music each set of these two or three or four counts (or beats) is called a MEASURE, and the first count is always the strongest. A piece of music will now be sung or played for each of the thirty-two spaces below, and you are to mark in the number of beats to a measure for each piece. Just to be sure you understand, the correct answers for No. 1 and No. 2 are given. Beginning with No. 3 you are to mark in your own opinions.

1 3	9	17	25
2 4	10	18	26
3	11	19	27
4	12	20	28
5	13	21	29
6	14	22	30
7	15	23	31
8	16	24	32

TEST III

STORIES and PICTURES

39			
N	S	R	P

DIRECTIONS: You have often noticed that some music seems happy or sad, and some seems to tell a story or paint a picture. A piece of music will now be played for each of the twenty-two three line sets below, and you are to place a cross by the one line which seems to tell what the music is about. To be sure you understand, No. 1 and No. 2 are marked. Beginning with No. 3 you are to mark in your own opinion.

1 X A very sad story
..... A gypsy girl
..... A ship at sea

2 ..... The forest in winter
X Evening in the garden
..... A beautiful sunrise

3 ..... A mysterious stranger
..... Serious trouble expected
..... Approach of the emperor

4 ..... Gay day at the fair
..... Witches' frolic
..... Childrens' games

5 ..... Storm in the night
..... The jolly dwarf
..... A mysterious story

6 ..... An oriental prayer
..... The Russian plains
..... The royal princess

7 ..... Mountaineers' dance
..... Grief at parting
..... Beautiful memories

8 ..... A grim and rockbound coast
..... Thunder storm at night
..... Pursuit of a runaway

9 ..... Forest murmurs
..... Herald of peace
..... Great happiness

10 ..... Reverent prayer
..... Desert caravan
..... Winter twilight

11 ..... Endless tramp of soldiers' feet
..... A heart torn between hope and fear
..... Sounds from the distant battlefield

12 ..... Longing for home
..... Safe harbor from the storm
..... Arrival of the knights at court

13 ..... Despair at being hopelessly lost
..... Sadness at being alone
..... Prayer in church

14 ..... Soldiers on parade
..... The hot and busy market place
..... The duke and his gay court

NOW TURN THE PAGE

N	39

15 ..... Prayer of peace for friends departed
..... Beginning of a bright new day
..... Vision of heaven at death

16 ..... Moonlight serenade
..... A friendly letter
..... Flight of a bird

17 ..... Autumn skies
..... Midnight adventure
..... Promise of punishment

18 ..... Boys and girls at happy play
..... Forest in the autumn
..... The weary traveller

19 ..... Calm sea and setting sun
..... The shadow of death
..... The lowly serving man

20 ..... Fear of misfortune
..... Early morning at the fair
..... Sad goodbye to happy days

21 ..... Hush before the thunder storm
..... Quiet of a deserted village
..... Calm of the mountains at dusk

22 ..... Grief for a broken toy
..... Hopeless prayer for mercy
..... Winding river between the hills

APPENDIX B

CATALOG OF TEST CONTENT

Form A, Test I, Section A (also Form B, Test I):

1. Molloy, J. L., "Love's Old Sweet Song", The Golden Book of Favorite Songs, first eight measures of the refrain, mixed quartet and piano. Chicago: The Hall and McCreary Co., 1923.

2. Swedish, "Night Song", The Home and Community Song Book, first eight measures, mixed quartet and piano. Boston: E. C. Schirmer Music Co., 1931.

3. Barnby, Joseph, "Now the Day is Over", The Golden Book of Favorite Songs, first stanza complete, mixed quartet and piano. Chicago: The Hall and McCreary Co., 1923.

4. Harrison, Annie F., "In the Gleaming", The Golden Book of Favorite Songs, first sixteen measures, mixed quartet and piano. Chicago: The Hall and McCreary Co., 1923.

5. Hopkins, John H., "We Three Kings of Orient Are", The Golden Book of Favorite Songs, first sixteen measures, mixed quartet and piano. Chicago: The Hall and McCreary Co., 1923.

6. Dykes, John B., "Lead Kindly Light", The Golden Book of Favorite Songs, first six and one-half measures, mixed quartet and piano. Chicago: The Hall and McCreary Co., 1923.

7. Negro, "Go Down Moses", The Golden Book of Favorite Songs, first eight measures, mixed quartet and piano. Chicago: The Hall and McCreary Co., 1923.

8. Provencal, "The Three Kings", Junior Songs, first eight measures, baritone unaccompanied. New York: The American Book Co., 1925.

9. Scotch,"Loch Lomond", Junior Songs, chorus, tenor unaccompanied. New York: The American Book Co., 1925.

10. Somersetshire, "The Raggle Taggle Gypsies", Junior Songs, first stanza, soprano unaccompanied. New York: The American Book Co., 1925.

11. Foster, Stephen C., "Massa's in the Cold Ground", The Golden Book of Favorite Songs, first eight measures, contralto unaccompanied. Chicago: The Hall and McCreary Co., 1923.

12. Irish, "Wearing of the Green", The Golden Book of Favorite Songs, first sixteen measures, tenor unaccompanied. Chicago: The Hall and McCreary Co., 1923.

13. Schumann, Robert, "The Two Grenadiers", Modern Music and Musicians, Part I, Vol. 3, first eight measures after voice entrance, baritone and piano. New York: The University Society, 1912.

14. Schubert, Franz, "Cradle Song", Fifty Selected Songs by Franz Schubert, first four measures, soprano and piano. New York: Carl Fischer, Inc., 1912.

15. Brahms, Johannes, "Come Soon", Music Highways and Byways, nine measures beginning with the fourth, contralto and piano. New York: Silver Burdett Co., 1936.

16. DeBeriot, Ch., Scene de Ballet, eight measures beginning in the tenth of the "Tempo di Bolero", violin and piano. New York: Carl Fischer, Inc., 1912.

17. Bruch, Max, Concerto, Op. 26, first eight measures of the second movement ("Adagio"), violin and piano. New York: G. Schirmer, Inc., 1900.

18. Thomas, Ambroise, Mignon, first nine measures of violoncello obligato in Act II, No. 12, "Andante" (third tempo).[27]

19. Mascagni, Pietro, Cavalleria Rusticana, horn theme, fourteen measures beginning with the twenty-eighth of "Andante" (second tempo), Act I.[27]

20. Verdi, Guiseppe, La Traviata, clarinet melody, sixteen measures beginning with the fifth of "Allegro assai vivo", Act II, No. 13.[27]

21. Verdi, Guiseppe, Il Trovatore, flute theme, eight measures of "Allegretto come prima", Act I, No. 2.[27]

22. Verdi, Guiseppe, La Traviata, violin theme, eight measures beginning with the second of "Andantino" (second tempo), Act III, No. 16.[27]

23. Beethoven, Ludwig van, Sonata, Op. 14, No. 2, first eight measures of second movement ("Andante"), piano. New York: G. Schirmer, Inc., 1894.

24. Schubert, Franz, Four Impromptus, No. 4, Op. 142, first sixteen measures, piano. New York: G. Schirmer, Inc., 1897.

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[27] This material was copied from the complete score shelved in the Library of Congress, Washington, D. C. A vocal score of this opera is published by G. Schirmer, Inc., New York.

25. Mendelssohn-Bartholdy, Felix, Morning Song, Op. 62, No. 4, eight measures, beginning with the fifth, piano. New York: G. Schirmer, Inc., 1912.

26. Chopin, Frederic, Valse brillante, Op. 34, No. 2, first sixteen measures, piano. New York: G. Schirmer, Inc., 1915.

27. Grieg, Edvard, Albumblatt, Op. 12, No. 7, first eight measures, piano. New York: G. Schirmer, Inc., 1899.

28. Haydn, Josef, Military Symphony, first eight measures of third movement ("Menuetto"), orchestra. New York: Harcourt, Brace and Co., 1936.

29. Wagner, Richard, Rienzi Overture, eight measures beginning on the seventy-first of the "Allegro energico" (second tempo), orchestra. New York: Harcourt, Brace and Co., 1936.

30. Beethoven, Ludwig van, Symphony No. 3 (Eroica), first eight measures of the second movement ("Marcia funebre"), orchestra. New York: Harcourt, Brace and Co., 1935.

31. Tschaikowsky, Peter I., Symphony No. 4, first eight measures and one beat of the second movement ("Andantino"), orchestra. New York: Harcourt, Brace and Co., 1935.

32. Wagner, Richard, "Dance of the Apprentices", Die Meistersinger von Nürnberg, sixteen measures beginning with the eleventh of "Mässiger Walzer-Zeitmass" (second tempo), orchestra. New York: Harcourt, Brace and Co., 1936.

Form A, Test I, Section B:

Each of the following is written as a dotted half note followed by a half rest in a measure of five-four meter. Tempo, a quarter note equals 50; all are for piano, sempre senza pedale.

1. E-major triad, closed position, on e'.
2. E-minor triad, closed position, on e'.
3. C-major triad, closed position, on c'.
4. G-major triad, closed position, on g'.
5. D-minor triad, closed position, on d'.
6. A-major triad, closed position, on a'.
7. B-major triad, closed position, on b.
8. E-flat-major triad, closed position, on e-flat.
9. G-minor triad, closed position, on G.
10. C-minor triad, closed position, on c.
11. G-major triad, closed position, on g.
12. A-minor triad, closed position, on A.
13. A-minor triad, first inversion, closed position, on c'.
14. D-minor triad, closed position, on d'.
15. F-major triad, first inversion, closed position, on c'.
16. C-major triad, closed position, on c'.
17. E-minor triad, second inversion, closed position, on b.
18. E-major triad, second inversion, closed position, on b.
19. A-minor triad, first inversion, closed position, on c'.
20. A-minor triad, first inversion, open position, on c'.
21. E-major triad, second inversion, open position, on b.
22. E-minor triad, second inversion, open position, on b.

23. C-major triad, open position, on c'.

24. F-major triad, second inversion, open position, on c'.

25. D-minor triad, open position, in d'.

26. A-minor triad, first inversion, open position, on c'.

27. C-major triad, closed position, on c'''.

28. F-major triad, second inversion, closed position, on c'''.

29. D-minor triad, closed position, on d'''.

30. A-minor triad, first inversion, closed position, on c'''.

31. E-minor triad, second inversion, closed position, on b''.

32. G-major triad, first inversion, closed position, on b''.

33. C-major triad, closed position, on c'''.

34. C-major triad, closed position, on c.

35. G-major triad, first inversion, closed position, on B.

36. E-minor triad, second inversion, closed position, on B.

37. A-minor triad, first inversion, closed position, on c.

38. D-minor triad, closed position, on d.

39. F-major triad, second inversion, closed position, on c.

40. C-major triad, closed position, on c.

41. A-major triad, first inversion, closed position, on c-sharp'.

42. E-flat-minor triad, closed position, on e-flat.

43. E-flat-minor triad, second inversion, closed position, on b-flat''.

44. F-major triad, first inversion, closed position, on A.

45. D-flat-major triad, second inversion, closed position, on A-flat.

46. A-major triad, closed position, on A.

47. A-major triad, first inversion, closed position, in two octaves, on c-sharp' and c-sharp''.

48. E-flat-minor triad, closed position, in two octaves, on e-flat and e-flat'.

49. E-flat minor triad, second inversion, closed position, in two octaves, on b-flat' and b-flat''.

50. F-major triad, first inversion, closed position, in two octaves, on A and a.

51. D-flat-major triad, second inversion, closed position, in two octaves, on A-flat and a-flat.

52. A-major triad, closed position, in two octaves, on A and a.

Form A, Test II, Sections A and B (also Form B, Test II):

Nos. 1 to 17 inclusive are performed by mixed quartet and piano; Nos. 18 to 32 inclusive are performed by orchestra.

1. Carey, Henry, "America", The Golden Book of Favorite Songs, first six measures. Chicago: The Hall and McCreary Co., 1923.

2. Ward, Samuel A., "America the Beautiful", The Golden Book of Favorite Songs, first eight measures. Chicago: The Hall and McCreary Co., 1923.

3. Spilman, James E., "Flow Gently Sweet Afton", The Golden Book of Favorite Songs, first sixteen measures. Chicago: The Hall and McCreary Co., 1923.

4. Woodbury, Isaac B., "Stars of the Summer Night", Golden Book of Favorite Songs, first eight measures. Chicago: The Hall and McCreary Co., 1923.

5. English, "Drink to Me Only with Thine Eyes", The Golden Book of Favorite Songs, first eight measures. Chicago: The Hall and McCreary Co., 1923.

6. Scotch, "Auld Lang Syne", The Golden Book of Favorite Songs, first eight measures. Chicago: The Hall and McCreary Co., 1923.

7. Irish, "The Last Rose of Summer", The Golden Book of Favorite Songs, first eight measures. Chicago: The Hall and McCreary Co., 1923.

8. Molloy, J. L., "Juanita", The Golden Book of Favorite Songs, first eight measures. Chicago: The Hall and McCreary Co., 1923.

9. Barnby, Joseph, "Sweet and Low", The Golden Book of Favorite Songs, first eight measures. Chicago: The Hall and McCreary Co., 1923.

10. Weber, Carl M. von, "Softly Now the Light of Day", The Golden Book of Favorite Songs, first eight measures. Chicago: The Hall and McCreary Co., 1923.

11. Bayly, Thomas H., "Gaily the Troubadour", The Golden Book of Favorite Songs, first eight measures. Chicago: The Hall and McCreary Co., 1923.

12. Irish, "Believe Me If All Those Endearing Young Charms", The Golden Book of Favorite Songs, first eight measures. Chicago: The Hall and McCreary Co., 1923.

13. Neopolitan, "Santa Lucia", The Golden Book of Favorite Songs, first eight measures. Chicago: The Hall and McCreary Co., 1923.

14. Willis, Richard S., "It Came Upon the Midnight Clear", The Golden Book of Favorite Songs, first eight measures. Chicago: The Hall and McCreary Co., 1923.

15. Monk, William H., "Abide with Me", The Golden Book of Favorite Songs, first eight measures. Chicago: The Hall and McCreary Co., 1923.

16. Marks, Godfrey, "Sailing", The Golden Book of Favorite Songs, first eight measures of chorus. Chicago: The Hall and McCreary Co., 1923.

17. Adam, Adolphe, "Cantique de Noël", Twice 55 Plus Community Songs (The New Brown Book), last twelve measures. Boston: C. C. Birchard and Co., 1929.

18. Haydn, Josef, Symphony No. 7 (Salomon), first eight measures of Trio of third movement ("Menuetto"). New York: Harcourt, Brace and Co., 1936.

19. Haydn, Josef, Surprise Symphony, eight measures beginning with the ninth of the Finale ("Allegro di molto"). New York: Harcourt, Brace and Co., 1936.

20. Brahms, Johannes, Symphony No. 2, first eight measures of third movement ("Allegretto grazioso"). New York: Harcourt, Brace and Co., 1935.

21. Tschaikowsky, Peter I., Symphony No. 5, eight measures beginning with the last beat of the ninth measure of the second movement ("Andante cantabile"). New York: Harcourt, Brace and Co., 1935.

22. Brahms, Johannes, Symphony No. 1, first eleven measures of the third movement ("Un poco Allegretto"). New York: Harcourt, Brace and Co., 1935.

23. Haydn, Josef, Surprise Symphony, first eight measures of the third movement ("Menuetto"). New York: Harcourt, Brace and Co., 1936.

24. Wagner, Richard, Tannhäuser Overture (Concert Version), eight measures beginning on the fifty-first of the "Allegro" (second tempo). New York: Harcourt, Brace and Co., 1936.

25. Mozart, W. A., G-minor Symphony, first eight measures of the second movement ("Andante"). New York: Harcourt, Brace and Co., 1936.

26. Tschaikowsky, Peter I., Symphony No. 5, first eight measures. New York: Harcourt, Brace and Co., 1935.

27. Beethoven, Ludwig van, Symphony No. 7, eight measures beginning with the third of the second movement ("Allegretto"). New York: Harcourt, Brace and Co., 1935.

28. Wagner, Richard, "The Flying Dutchman Overture, first eight measures of "Andante" (second tempo). New York: Harcourt, Brace and Co., 1936.

29. Brahms, Johannes, Symphony No. 3, first eight measures of the third movement ("Poco allegretto"). New York: Harcourt, Brace and Co., 1935.

30. Tschaikowsky, Peter I., Symphony No. 6, eight measures beginning with the third beat of the thirty-second measure of the second movement ("Allegro con grazia"). New York: Harcourt, Brace and Co., 1935.

31. Dvorak, Anton, Symphony No. 5 (New World), sixteen measures of the third movement ("Scherzo"), beginning at the second tempo ("Poco sostenuto"). New York: E. F. Kalmus Orchestra Scores, Inc., 1932.

32. Tschaikowsky, Peter I., Romeo and Juliet, eleven measures and one beat beginning on measure 150. New York: Harcourt, Brace and Co., 1938.

Form A, Test III (also Form B, Test III):

All numbers are performed by orchestra. The material was copied from complete scores shelved in the Library of Congress, Washington, D. C.; vocal scores of these operas are published by G. Schirmer, Inc., New York.

1. Verdi, Guiseppe, La Traviata, first seven measures and a resolution.

2. Thomas, Ambroise, Mignon, first four measures and one beat of "Second Tableau" (immediately preceding No. 12).

3. Verdi, Guiseppe, Rigoletto, the first, second, third, and tenth to fifteenth measures inclusive, and a resolution.

4. Gounod, Charles, Faust, first eight measures of "Second Tableau" (No. 3).

5. Verdi, Guiseppe, Il Trovatore, sixteen measures, beginning on the third beat of the twenty-third measure of the sixth tempo ("Allegro assai agitato") of No. 3.

6. Verdi, Guiseppe, Aida, first four and eleventh to fifteenth measures inclusive of the fourth tempo ("Allegro assai moderato") of Act I.

7. Verdi, Guiseppe, La Traviata, eight measures beginning with the fifteenth of No. 9.

8. Verdi, Guiseppe, Rigoletto, thirty three measures beginning on the two hundred and third measure of No. 18.

9. Leoncavallo, Ruggiero, Pagliacci, seven measures and two beats of "Piu mosso, perdutamente con passione" of Act I, Seene 3.

10. Wagner, Richard, Tannhäuser, sixteen measures beginning with the sixty-fourth last measure of Act III, Scene 1.

11. Verdi, Guiseppe, Aida, seventeen measures beginning with the eighth tempo ("Allegro agitato e presto") of Act I, not counting the ninth to sixteenth measures inclusive, which are omitted.

12. Thomas, Ambroise, Mignon, twelve measures beginning at the third tempo ("Andante") of the Overture.

13. Wagner, Richard, Tannhäuser, six measures beginning with the tenth tempo ("Andante) of Act III, Scene 3, not counting the third and sixth measures, which are omitted, and including a resolution, which is added.

14. Verdi, Guiseppe, Rigoletto, sixteen measures beginning with the forty-second of the second tempo ("Allegro con brio").

15. Verdi, Guiseppe, Aida, last seven measures of the opera.

16. Gounod, Charles, Faust, eight measures beginning with the fourteenth measure of the second tempo ("Adagio").

17. Verdi, Guiseppe, Rigoletto, sixteen measures and one beat of the fifth tempo ("Vivace") of No. 5.

18. Gounod, Charles, Faust, sixteen measures beginning with the fifth of the second tempo ("Allegretto") of Act I.

19. Verdi, Guiseppe, La Traviata, eleven measures and a resolution, beginning on the eighth measure of Act III.

20. Verdi, Guiseppe, Rigoletto, ten measures and a resolution, beginning with the twenty-fourth last measure of Act I.

21. Bizet, Georges, Carmen, six measures and one beat of the "Entr'Acte" to Act III.

22. Bizet, Georges, Carmen, nine measures, beginning with the second of the seventh last tempo ("Allegro moderato") of Act IV.

Form A, Test IV:

The material for numbers marked * was copied from complete scores shelved in the Library of Congress, Washington, D. C.; vocal scores of these works are published by G. Schirmer, Inc., New York.

1. Gounod, Charles, "Soldiers' Chorus", Faust, eight measures, beginning with the second measure of the fifth tempo ("Tempo marziale") of No. 14, orchestra.*

2. Spanish, "Juanita", Golden Book of Favorite Songs, last eight measures, mixed quartet and piano. Chicago: The Hall and McCreary Co., 1923.

3. Handel, Georg Friederich, "Hallelujah Chorus", The Messiah, eight measures, beginning with the fourth, orchestra and organ.*

4. Schumann, Robert, Traumerei, Op. 15, No. 7, first eight measures, piano. New York: Belwin, Inc., no copyright.

5. Handel, Georg Friederich, "Ombra mai fu" ("Largo"), Xerxes, twelve measures, beginning at "Aria", tenor and orchestra.*

6. Foster, Stephen C., "Old Folks at Home", The Golden Book of Favorite Songs, first eight measures of the third stanza, mixed quartet and piano. Chicago: The Hall and McCreary Co., 1923.

7. Bizet, Georges, "Toreador Song", Carmen, eight measures beginning with the thirty-seventh measure of No. 14, baritone and orchestra.*

8. MacDowell, Edward, "To a Wild Rose", Woodland Sketches, first eight measures, piano. Boston: The Arthur P. Schmidt Co., 1924.

9. Wagner, Richard, "To the Evening Star", Tannhäuser, ten measures beginning with the fortieth of Scene 2, Act II, baritone and orchestra.*

10. Dvorak, Anton, Symphony No. 5 (New World), four measures of the second movement ("Largo"), beginning with the seventh, orchestra. New York: E. F. Kalmus Orchestra Scores, Inc., 1932.

11. Donizetti, Gaetano, "Sextette", Lucia di Lammermoor, nine measures and two beats of the sixth tempo ("Larghetto") of No. 9, tener, baritone, and orchestra.*

12. Schubert, Franz, Serenade (Standchen), first ten measures, soprano and piano. New York: G. Schirmer, Inc., 1911.

13. Bach, J. S., Air (Air for the G String), first five measures, violin and piano. New York: G. Schirmer, Inc., 1904.

14. Rossini, Gioacchino, William Tell Overture, seventeen measures, beginning two sixteenth notes before the eighteenth measure of the "Finale", orchestra. New York: Carl Fischer, Inc., 1922.

15. Negro, Deep River, first ten measures, baritone and piano. New York: G. Ricordi and Co., Inc., 1917.

16. Russian, "The Volga Boatman", Music of Many Lands and Peoples, first nine measures, baritone and piano. New York: Silver Burdett Co., 1932.

17. Saint-Saëns, Camille, "The Swan", Carnival of the Animals, first nine measures, orchestra. Paris: Durand et Cie, 1922.

18. Irish, Londonderry Air, eight measures, beginning on the second half of the third beat ot the twenty-first measure, orchestra. New York: Carl Fischer, Inc., 1922.

19. Liszt, Franz, Liebestraum No. 3 in Ab, first six measures, piano. New York: G. Schirmer, Inc., no copyright.

20. Welsh, "All Through the Night", The Gray Book of Songs, first eight measures of the third stanza, mixed quartet and piano. Chicago: The Hall and McCreary Co., 1923.

21. Schubert, Franz, Symphony in B-minor (Unfinished), ten measures beginning on the thirty-ninth, orchestra. New York: Harcourt, Brace and Co., 1936.

22. Beethoven, Ludwig van, Sonata quasi una fantasia (Moonlight), Op. 27, No. 2, first eight measures and one beat, piano. New York: G. Schirmer, Inc., 1894.

23. Chopin, Frederic, Polonaise in A (Militaire), Op. 40, No. 1, first eight measures, piano. New York: G. Schirmer, Inc., 1894.

24. Grieg, Edvard, "Anitra's Dance", Peer Gynt, first twenty-two measures, orchestra. New York: Carl Fischer, Inc., 1926.

25. Haydn, Josef, Surprise Symphony, first sixteen measures of the second movement ("Andante"), orchestra. New York: Harcourt, Brace and Co., 1936.

26. Schubert, Franz, Ave Maria, Op. 52, No. 6, first six measures and one beat, soprano and piano. New York: G. Schirmer, Inc., 1902.

27. Beethoven, Ludwig van, Symphony No. 5, first ten measures of the second movement ("Andante con moto"), orchestra. New York: Harcourt, Brace and Co., 1935.

28. Mendelssohn-Bartholdy, Felix, "O rest in the Lord", Elijah, six measures and one beat, contralto and orchestra.*

29. Verdi, Guiseppe, "Celeste Aida", Aida, eight measures, beginning with the third tempo ("Andantino") of Act I, tenor and orchestra.*

30. Verdi, Guiseppe, "Triumphal March", Aida, six measures, beginning with the fourth beat of the one hundred twelfth measure of Scene 2, Act II, orchestra.*

31. Schubert, Franz, The Erlking, the first five and thirteenth to twenty-fourth measures inclusive, soprano and piano. New York: Carl Fischer, Inc., 1911.

32. Brahms, Johannes, Hungarian Dance No. 5, first sixteen measures, orchestra. Boston: Oliver Ditson Co., 1924.

APPENDIX C

MEMBERSHIP OF CRITERION GROUP

John Quincy Bass, Faculty, College of Music of Cincinnati

Will H. Bryant, Music Faculty, Indiana State Teachers College

Chester N. Channon, Music Faculty, Western Kentucky State Teachers College

Sarah Y. Cline, Lecturer on Music Education, University of Cincinnati

Jane Cole, Graduate Assistant in Music, Miami University

Philip Dreifus, (formerly) Cincinnati Symphony Orchestra

Sidney C. Durst, Director of Studies, College of Music of Cincinnati

Mildred Eakes, Educational Director, Cincinnati Conservatory of Music

Lawrence E. Eberly, Music Faculty, Indiana State Teachers College

Louis P. Fritze, Cincinnati Symphony Orchestra

Nicholas Gabor, Cincinnati Symphony Orchestra

Giacinto Gorno, Faculty, College of Music of Cincinnati

Carol Jean Harrin, Instructor in Education, University of Cincinnati

Howard W. Hess, Faculty, College of Music of Cincinnati

Alan Irwin, Dean of the Conservatory, Ward-Belmont School

Herbert Jenkel, Cincinnati Symphony Orchestra

Arthur Knecht, Cincinnati Symphony Orchestra

Lois Wilson Lautner, Faculty, Arthur Jordan Conservatory of Music

Elizabeth Meloy, Music Faculty, Ball State Teachers College

Carlo Mastropaolo, Cincinnati Symphony Orchestra

Renato Mastropaolo, Cincinnati Symphony Orchestra

Merrill McEwen, Associate Professor of Music, Bowling Green State University

Grace Morley, Faculty, School of Music, Ohio University

Herbert Newman, Faculty, College of Music of Cincinnati

Fred Noak, Cincinnati Symphony Orchestra

Claude E. Palmer, Head of Music Department, Ball State Teachers College

Norman F. Phelps, Faculty, Arthur Jordan Conservatory of Music

Lawrence H. Riggs, Faculty, Conservatory of Music, Ward-Belmont School

Harold Roberts, Cincinnati Symphony Orchestra

Elmer Ronka, Cincinnati Symphony Orchestra

Herbert Silbersack, Cincinnati Symphony Orchestra

Elizabeth M. Taylor, Principal, Department of School Music, College of Music of Cincinnati

J. Herman Thuman, Director, College of Music of Cincinnati

Herbert Tiemeyer, Cincinnati Symphony Orchestra

Franz Trefzger, Faculty, College of Music of Cincinnati

James E. Van Peursam, Director of Music, Eastern Kentucky State Teachers College

Henry Wasserman, Cincinnati Symphony Orchestra

William B. Wilkins, Cincinnati Symphony Orchestra

Henry Wohlgemuth, Cincinnati Symphony Orchestra

Irving Wolfe, Head, Music Department, George Peabody College for Teachers

Dorothy Woods, Graduate Assistant, Arthur Jordan Conservatory of Music

Name withheld, Music Faculty, Bowling Green State University

APPENDIX D

INSTITUTIONS SUPPLYING DATA FOR THE PRESENT STUDY, WITH COOPERATING ADMINISTRATIVE OFFICERS AND DATE OF TESTING

Colleges

Arthur Jordan Conservatory of Music, Indianapolis, Ind.
Ada Bicking, Director
September 27, 1940

Ball State Teachers College, Muncie, Ind.
Claude E. Palmer, Head of Music Department
September 19-20,1940

Bowling Green State University, Bowling Green, Ohio
Merrill C. McEwen, Associate Professor of Music
September 27, 1940

Cincinnati Conservatory of Music, Cincinnati, Ohio
Mildred Eakes, Educational Director
October 4, 1940

College of Music of Cincinnati, Cincinnati, Ohio
J. Herman Thuman, Director
September 24, 1940

Eastern Kentucky State Teachers College, Richmond, Ky.
W. C. Jones, Dean
October 10, 1940

George Peabody College for Teachers, Nashville, Tenn.
Irving Wolfe, Head, Music Department
October 2-3, 1940

Indiana State Teachers College, Terre Haute, Ind.
Arthur Hill, Head of Music Department
September 17-18, 1940

Miami University, Oxford, Ohio
Joseph W. Clokey, Dean School of Fine Arts
November 26-28, 1940

Ohio University, Athens, Ohio
C. C. Robinson, Director, School of Music
September 26, 1940

Ward-Belmont School, Nashville, Tenn.
Alan Irwin, Dean, Conservatory of Music
October 3, 1940

Western Kentucky State Teachers College, Bowling Green, Ky.
Chester N. Channon, Faculty of Music
October 1, 1940

Public Schools

Batavia Public Schools, Batavia, Ohio (Grades 4 - 12)
Paul K. Moore, Superintendent
November 13-14, 1940

Fairview Public School, Cincinnati, Ohio (Grades 4 - 8)
John W. Snyder, Principal
October 16 - November 25, 1940

Holmes High School, Covington, Ky. (Grades 10 - 12)
H. B. Smith, Supervising Principal
January 10-17, 1941

Hughes High School, Cincinnati, Ohio (Grades 9-12)
Arthur Havlovic, Assistant Principal
October 11-24, 1940

Milford Public School, Milford, Ohio (Grades 4 - 12)
M. H. Burkholder, Superintendent
November 11-12, 1940

Southgate Public School, Southgate, Ky. (Grades 4 - 9)
Boyd Howard, Superintendent
September 11, 1940

APPENDIX E

PERCENTILE RANKS
FORM A, TEST I-A
FORM B, TEST I

Score	Percentile Rank			
	College Music Freshmen N = 307	Senior High School N = 467	Junior High School N = 453	Intermediate Grades N = 400
30.....	98		99	
29.....	90		99	
28.....	82	99	99	
27.....	75	98	98	99
26.....	68	97	97	99
25.....	60	95	97	99
24.....	51	93	96	99
23.....	42	89	94	98
22.....	36	83	92	96
21.....	30	75	88	94
20.....	24	68	83	92
19.....	18	61	79	88
18.....	13	51	72	80
17.....	9	41	63	71
16.....	7	31	53	62
15.....	5	23	41	52
14.....	3	16	28	41
13.....	2	9	19	28
12.....		6	11	18
11.....		4	6	12
10.....	1	2	4	7
9.....		1	2	3
8.....			1	1

PERCENTILE RANKS
FORM A, TEST I-B

Score	Percentile Rank		Score	Percentile Rank	
	College Music Freshmen N = 308	Senior High School N = 455		College Music Freshmen N = 308	Senior High School N = 455
50	98		32	25	73
49	95	99	31	20	67
48	92	99	30	16	59
47	89	98	29	12	48
46	85	98	28	8	39
45	82	97	27	6	30
44	79	97	26	5	22
43	75	97	25	5	15
42	70	97	24	5	9
41	64	96	23		5
40	60	95	22	2	3
39	55	94	21	1	2
38	50	93	20		1
37	46	91	18	1	
36	43	89	17	1	
35	38	86	16		1
34	33	83			
33	30	79			

PERCENTILE RANKS
FORM A, TEST II-A
FORM B, TEST II

Score	Percentile Ranks			
	College Music Freshmen N = 308	Senior High School N = 467	Junior High School N = 444	Inter-mediate Grades N = 400
29.....	99			
28.....	99			
27.....	98		99	
26.....	94	99		
25.....	86	99	99	
24.....	76	98	98	
23.....	65	97	97	99
22.....	55	93	97	99
21.....	46	89	96	98
20.....	38	85	94	97
19.....	30	80	93	97
18.....	24	73	90	95
17.....	20	66	85	91
16.....	14	57	80	87
15.....	10	49	72	81
14.....	7	39	62	73
13.....	5	30	50	62
12.....	4	23	40	51
11.....	2	17	31	42
10.....	1	12	22	33
9.....	1	8	15	24
8.....		5	10	16
7.....		3	6	10
6.....		1	3	5
5.....		1	1	2
4.....			1	1

PERCENTILE RANKS
FORM A, TEST II-B

Score	Percentile Ranks	
	College Music Freshmen N = 310	Senior High School N = 461
30.....	99	
29.....	96	
28.....	89	99
27.....	79	99
26.....	68	98
25.....	55	95
24.....	42	91
23.....	31	85
22.....	23	78
21.....	16	66
20.....	11	56
19.....	8	47
18.....	6	40
17.....	5	33
16.....	3	25
15.....	2	19
14.....	1	14
13.....	1	9
12.....	1	5
11.....		3
10.....		2
9.....		1
8.....		1

PERCENTILE RANKS
FORM A, TEST III
FORM B, TEST III

Score	Percentile Rank			
	College Music Freshmen N = 309	Senior High School N = 461	Junior High School N = 441	Inter-mediate Grades N = 394
20.....		99		
19.....	99	99	99	99
18.....	98	99	99	99
17.....	95	98	98	99
16.....	89	96	95	98
15.....	81	89	89	94
14.....	69	79	78	86
13.....	52	67	64	73
12.....	35	53	47	57
11.....	22	39	29	41
10.....	13	24	14	27
9.....	6	13	5	15
8.....	2	6	1	8
7.....		2		4
6.....		1		1
4.....				1

PERCENTILE RANKS
FORM A, TEST IV

Score	Percentile Rank		Score	Percentile Rank	
	College Music Freshmen N = 309	Senior High School N = 461		College Music Freshmen N = 309	Senior High School N = 461
115.....	99		75.....	87	
109.....	99		74.....	87	
107.....	99		73.....	86	
104.....	98		72.....	85	
103.....	98		71.....	84	
102.....	98		70.....	83	99
101.....	98		69.....	83	
100.....	97		68.....	82	
98.....	97		67.....	81	
95.....	96		66.....	80	
92.....	96		65.....	79	
91.....	95		64.....	78	
90.....	95		63.....	77	
89.....	94		62.....	77	99
88.....	94		60.....	76	99
87.....	93		58.....	74	
86.....	93		57.....	74	99
83.....	92		56.....	73	
82.....	92		55.....	72	99
81.....	91		54.....	70	
80.....	91		53.....	69	
79.....	89		52.....	68	
78.....	89		51.....	67	
77.....	88		50.....	66	
76.....	88		49.....	65	

PERCENTILE RANKS
FORM A, TEST IV
CONTINUED

Score	Percentile Rank		Score	Percentile Rank	
	College Music Freshmen N = 309	Senior High School N = 461		College Music Freshmen N = 309	Senior High School N = 461
48	64		24	27	77
47	63		23	25	75
46	62	98	22	23	72
45	61		21	22	70
44	60	98	20	20	67
43	58	98	19	17	62
42	56	97	18	15	58
41	53	97	17	14	55
40	52	96	16	12	52
39	51	96	15	11	48
38	49	96	14	8	45
37	48	96	13	6	42
36	47	95	12	5	38
35	45	95	11		35
34	43	94	10	5	32
33	41	93	9		26
32	39	92	8	3	21
31	37	91	7		17
30	34	89	6		14
29	32	88	5		11
28	31	86	4	1	8
27	30	84	3		5
26	29	82	2		4
25	28	79	1		3

APPENDIX F

COLLEGE OF MUSIC OF CINCINNATI

Music Education Department

Below is a selected list of well known compositions. It would be deemed a favor if you would check twenty of these numbers that you feel a student should know before entering as a freshman in the College of Music.

Bach: Air for the G String _____

Beethoven: Adagio, Moonlight Sonata _____

Adagio, Sonata Pathetique _____

Andante con moto, Symphony V (C minor) _____

Allegro con brio, Symphony V (C minor) _____

Marche funebre, Symphony III, "Eroica" _____

Overture, Leonore No. 3 _____

Turkish March, "The Ruins of Athens" _____

Bizet: Habanera, "Carmen" _____

Toreador Song, "Carmen" _____

Brahms: Hungarian Dance No. 5 _____

Chopin: Military Polonaise _____

Debussy: Afternoon of a Faun _____

Reflections on the Water _____

Donizetti: Sextette, "Lucia di Lammermoor _____

Dvorak: Largo, Symphony V, "New World" _____

Songs My Mother Taught Me _____

Foster: Old Folks at Home _____

French: Au claire de la Lune _____

Ghys: Amaryllis _____

Grainger: Shepherd's Hey _____

Grieg: Peer Gynt Suite -- Anitra's Dance _____

Ase's Death _____

In the Hall of the Mountain King _____

Solvejg's Cradle Song _____

To Spring _____

Irish: Londonderry Air _____

Händel: Hallelujah Chorus, "The Messiah" _____

The Harmonious Blacksmith _____

Largo, "Xerxes" _____

Haydn: Andante, "Surprise Symphony" _____

Leoncavallo: Prologue, "Pagliacci" _____

Liszt: Les Preludes _____

Liebestraum _____

MacDowell: To a Wild Rose _____

Mendelssohn: O Rest in the Lord, "Elijah" _____

Overture, "Midsummer Night's Dream" _____

Scherzo, "Midsummer Night's Dream _____

Mozart: Allegro molto, Symphony in G minor _____

Minuet, "Don Giovanni" _____

Overture, "The Magic Flute" _____

Negro: Deep River _____

Rimsky-Korsakov: Sheherezade Suite --

The Young Prince and the Young Princess _____

The Festival at Bagdad _____

Rossini: Overture, "William Tell" _____

Russian: The Volga Boatman _____

Saint-Saens: Danse Macabre _____

My Heart at They Sweet Voice, "Samson and Dalilah" _____

The Swan _____

Suite Algerienne -- Marche _____

Schubert: Allegro moderato, "Unfinished Symphony" _____

Ave Maria _____

The Erlking _____

Hark, Hark the Lark _____

Moment Musical, F minor _____

Serenade _____

Schumann: The Lotus Flower _____

Traumerei _____

The Two Grenadiers _____

Tchaikovsky: Andante, first movement, "Symphony Pathetique" _____

Marche Slav _____

Nutcracker Suite --

Danse Arabe _____

Marche _____

Danse Chinoise _____

Danse des Mirlitons _____

Overture, 1812 _____

Verdi: Celeste Aida, "Aida" _____

Triumphal March, "Aida" _____

von Weber: Overture, der Freischütz ____

Wagner: Evening Star, "Tannhäuser" ____

Love Death, "Tristan and Isolde" ____

Magic Fire Scene, "The Valkyrie" ____

Overture, "Tannhäuser" ____

Prelude, "Lohengrin" ____

Prelude, "die Meistersinger" ____

Ride of the Valkyries, "The Valkyrie" ____

Walther's Prize Song, "die Meistersinger" ____

Welsh: All Through the Night ____

If any compositions have been omitted from the list that you feel should be included, you are urged to mention them below.

_____

_____

_____

_____

_____

APPENDIX G

BASIC DATA OBTAINED FROM ADMINISTERING TEST I
OF THE MEASURES OF MUSICAL BACKGROUND
TO COLLEGE FRESHMEN ENTERING THE MUSIC FIELD
AND TO SENIOR HIGH SCHOOL STUDENTS

Institution	Section A Melodies			Section B Chords		
	N	Total Score	Mean	N	Total Score	Mean
College A	34	834	24.53	34	1390	40.88
B	16	335	20.94	16	514	32.13
C	36	891	24.75	36	1385	38.47
D	21	492	23.43	21	730	34.76
E	28	639	22.82	29	1052	36.28
F	55	1275	23.18	54	2059	37.76
G	14	314	22.43	14	494	35.29
H	34	791	23.26	35	1300	37.14
I	16	352	22.00	16	561	35.06
J	12	309	25.75	12	519	43.25
K	25	559	22.36	25	947	37.88
L	15	350	23.33	15	580	38.67
Totals	306	7141		307	11511	
Weighted mean			23.33			37.50
Senior High School M	139	2583	18.58	127	3776	29.73
N	123	2119	17.23	125	3754	30.52
O	140	2530	18.07	140	4203	30.02
P	65	1209	18.60	65	1834	28.22
Totals	467	8441		455	13567	
Weighted mean			18.08			29.82

BASIC DATA OBTAINED FROM ADMINISTERING TEST II
OF THE MEASURES OF MUSICAL BACKGROUND
TO COLLEGE FRESHMEN ENTERING THE MUSIC FIELD
AND TO SENIOR HIGH SCHOOL STUDENTS

Institution	Section A Meter			Section B Tempo		
	N	Total Score	Mean	N	Total Score	Mean
College A	34	799	23.50	35	892	25.49
B	16	298	18.63	16	400	25.00
C	36	795	22.08	36	924	25.67
D	21	455	21.67	21	516	24.57
E	28	575	20.54	51	1172	22.98
F	55	1095	19.91	33	744	22.55
G	14	285	20.36	14	337	24.07
H	35	673	19.23	35	841	24.03
I	16	319	19.94	16	403	25.19
J	12	276	23.00	14	357	25.50
K	25	522	20.88	24	554	23.08
L	15	280	18.67	14	320	22.86
Totals	307	6372		309	7460	
Weighted mean			20.76			24.14
Senior High School M	140	2110	15.07	139	2631	18.93
N	123	2076	16.88	125	2433	19.46
O	141	1958	13.89	136	2545	18.71
P	63	977	15.51	61	1073	17.59
Totals	467	7121		461	8682	
Weighted mean			15.25			18.83

BASIC DATA OBTAINED FROM ADMINISTERING TESTS III AND IV
OF THE MEASURES OF MUSICAL BACKGROUND
TO COLLEGE FRESHMEN ENTERING THE MUSIC FIELD
AND TO SENIOR HIGH SCHOOL STUDENTS

Institution	Test III Dramatic Feeling			Test IV Knowledge of Musical Literature		
	N	Total Score	Mean	N	Total Score	Mean
College A	34	425	12.50	34	1978	58.18
B	16	204	12.75	16	645	40.31
C	36	487	13.53	36	1955	54.31
D	20	271	13.55	20	1272	63.60
E	52	669	12.87	52	1718	33.04
F	33	414	12.55	33	1182	35.82
G	14	176	12.57	14	568	40.57
H	35	431	12.31	35	1235	35.29
I	16	206	12.88	16	542	33.88
J	14	200	14.29	14	703	50.21
K	24	305	12.71	24	807	33.63
L	14	174	12.43	14	670	47.86
Totals	308	3962		308	13275	
Weighted mean			12.86			43.10
Senior High School M	140	1656	11.8286*	142	2310	16.27
N	125	1449	11.5920	128	2080	17.05
O	135	1632	12.0889	136	2441	17.95
P	61	715	11.7213	61	978	16.05
Totals	461	5452		461	7808	
Weighted mean			11.7265			16.94

*It is necessary to carry these means to four places.

BASIC DATA OBTAINED FROM ADMINISTERING TESTS I AND II
OF THE MEASURES OF MUSICAL BACKGROUND
TO JUNIOR HIGH SCHOOL AND INTERMEDIATE GRADE PUPILS

Institution	Test I Major and Minor			Test II Counting		
	N	Total Score	Mean	N	Total Score	Mean
Junior High School Q.....	135	2295	17.22	131	1786	13.63
R.....	140	2156	15.40	139	1600	11.51
S.....	139	2313	16.64	133	1865	14.02
T.....	41	625	15.20	41	552	13.46
Totals.....	458	7385		444	5803	
Weighted mean.....			16.30			13.07
Elementary School U.....	131	1937	14.79	131	1555	11.87
V.....	115	1780	15.48	115	1186	10.31
W.....	104	1598	15.38	104	1394	13.40
X.....	50	718	14.36	50	611	12.22
Totals.....	400	6033		400	4746	
Weighted mean.....			15.08			11.87

BASIC DATA OBTAINED FROM ADMINISTERING TEST III
OF THE MEASURES OF MUSICAL BACKGROUND
TO JUNIOR HIGH SCHOOL AND INTERMEDIATE GRADE PUPILS

Institution	Test III Stories and Pictures		
	N	Total Score	Mean
Junior High School Q.....	128	1534	11.98
R.....	139	1632	11.74
S.....	133	1724	12.96
T.....	41	532	12.98
Totals.....	441	5422	
Weighted mean.....			12.29
Elementary School U.....	126	1469	11.66
V.....	114	1230	10.79
W.....	104	1246	11.98
X.....	50	569	11.38
Totals.....	394	4514	
Weighted mean.....			11.46