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with notes and an accompanying essay by

David Nicholls

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NEW MUSICAL RESOURCES

HENRY COWELL

NEW YORK · ALFRED·A·KNOPF · LONDON

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INTRODUCTION

Contemporary music makes almost universal use of materials formerly considered unusable. These materials are in some degree acceptable to almost all music-lovers, and there is a tendency on the part of critics and the sophisticated public to be somewhat bored by new music which uses only old-fashioned means. In spite of their current use, however, little is known about the materials of contemporary music, and there are surprisingly few attempts to organize them into a unified system. Notwithstanding some very interesting works on new problems in music (such as Redfield's *Music: a Science and an Art*), written for the most part by scientists rather than musicians, a system co-ordinating the various materials of modern music has not been made public, so far as I know. Schönberg in his *Harmonielehre* carried the conventional study of harmony a step further. He explained many moderately complex harmonies by combining more chromatic passing tones and pointed out some well-known primary overtone relationships; but his work fails to explain music as involved as Schönberg's own compositions. A later theory, as yet unpublished by Schönberg, investigates very thoroughly the possibilities of the twelve-tone scale; which is, however, only one facet of contemporary materials.

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INTRODUCTION

Eaglefield Hull in his book *Modern Harmony* has made one of the few attempts to give a general explanation of modern phenomena. Hull did not, however, offer any theory as to why the particular materials actually in use should have been found more acceptable than many other means which might have been used in their place. Although Hull's book was written some years ago, his efforts in classifying musical means without giving reasons for their existence are reflected in the attitude of some musicians today. If a student is told that triads are built on intervals of a third, he is not thereby made aware of the entire system of conventional harmony. He not only must know why thirds are acceptable materials for building triads, but must study the details of chord-connexion, perhaps for years, to gain a knowledge of their handling. Similarly, to state that a certain chord in modern music is built up in fourths is not a sufficient explanation. A reason for the suitability of fourths as building-material must be shown, as well as some idea of the practical problems to be overcome in connecting fourth chords, before any knowledge of such chords is gained.

The purpose of *New Musical Resources* is not to attempt to explain the materials of contemporary music, many of which are not included in its discussion, but to point out the influence the overtone series has exerted on music throughout its history, how many musical materials of all ages are related to it, and how, by various means of applying its principles in many different man-

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ners, a large palette of musical materials can be assembled. Some of them are in use, some of them are presaged in contemporary music, and some of them seem to be unused so far. Whether such materials are or are not in use it is not the purpose to discover; rather the purpose is to show the co-ordination of all possible musical materials within a certain overtone radius, regardless of whether they are yet in actual use. The very fact that such materials are built on the overtone series, which is the greatest factor in musical relationship, shows that they probably have potential musical use and value. That many of them remain as yet unused or only very tentatively suggested, makes the field which is opened up all the richer.

The result of a study of overtones is to find the importance of relationships in music and to find the measure by which every interval and chord may be related. It is discovered that the sense of consonance, dissonance, and discord is not fixed, so that it must be immovably applied to certain combinations, but is relative. It is also discovered that rhythm and tone, which have been thought to be entirely separate musical fundamentals (and still may be considered so in many ways) are definitely related through overtone ratios. Therefore the theory proposed may be termed a theory of musical relativity.

Incidentally, one of the results of an examination into the application of overtone relationships is to discover a way of logically co-ordinating many seemingly chaotic

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materials used in contemporary music, so that without that being its purpose, *New Musical Resources* throws an illumination on some difficult problems of "modernism," and shows that much "modern" music is not proceeding blindly. This is not always true, of course, as in many cases it suffers from a lack of knowledge by the composer of the materials used; and there is without question much inconsistency of texture to be found in some contemporary composition.

The aim of any technique is to perfect the means of expression. If a technique serves to dry up and inhibit the expression, it is useless as technique. Leaving the means of expression imperfect, however, does not solve the problem. Hearing innumerable passages in contemporary music which it is evident could be improved by the changing of a few mistaken notes (not to conform to some preconceived standard, but to express more consistently the composer's own idea) makes one wish that there could be more precision in the choice of notes, more intellectual understanding of each particular harmonic connexion. It may be felt that this work is done in the study of conventional harmony. Harmony as it is taught, however, contains discrepancies. Some of its rules are based on underlying science and more inevitable principles, but many other rules, inextricably mixed with the necessary ones, are based on the taste of a former era of music and are subject to change. Perhaps because these empirical rules have little application to problems of contemporary music, there has

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been on the part of some a reaction against the idea that knowledge of musical materials is necessary. Now, however, it is generally conceded that ignorant daring in the use of new materials results in many childish crudities and is often accompanied by absence of musical invention. It is therefore of interest to make public a system showing the relationship and use of contemporary materials. The aim in suggesting new materials is not, of course, to have them supersede old ones, but rather to supplement them, as well as adding new resources to the entire tonal palette.

Because the present work is not an attempt to explain the methods of specific composers, no quotations have been taken from actual compositions, but all necessary examples have been specially constructed to illustrate the various points.

A discussion of different sorts of temperament, or tuning, has not been attempted, as it has been assumed that the tones of the overtone series, being unconsciously if not consciously heard whenever a single tone is sounded, are a natural criterion. Therefore all temperaments from this point of view may be considered as an attempt to solve the problem of making some of the overtone relationships practical for musical use. In order to do this it has been necessary to alter the relationships slightly in various ways, by equalizing minute differences, etc. But it seems probable that a keen auditor has suggested to him through his musical imagination the overtone relationship nearest to the very close

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equivalents of the different modes of temperament, of which some are closer than others to the original series. Differences of temperament, however, and practical methods for making them possible on musical instruments, form a fascinating subject. Divisions of the octave into mathematically equal parts form the basis for the scales in much music. Javanese music divides the octave into five equal parts; Siamese music uses a scale of nine equal divisions of the octave. The whole-tone scale as used by Debussy and others divides the octave into six parts. Our own keyboard instruments divide the octave into twelve parts, and Schönberg bases his new theoretical system on such a division. The quarter-tone scale as proposed by Alois Hába and others would divide the octave into twenty-four equal steps. These divisions are not unrelated to the overtone series, as the intervals they form can be found among overtone relationships. Other systems of temperament more immediately related to the overtone series deal with unequal or diatonic divisions of the octave. Interest in differences of temperament comes largely through consideration of scales. In this work it is suggested that scales as well as other aspects of music are related to the overtone series, which is a scale in its upper reaches, a harmony in its lower reaches, and a basis for rhythmical co-ordination.

It is not the aim of this work to delve into questions of æsthetics, into any philosophical discussion of what

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is good or bad, what should or should not be done, or what may or may not be done. These are questions which are answered by the dictates of taste, and taste and fashions in taste change. It is my conviction, however, that the finest taste and the perfect use of scientifically co-ordinated materials go together, and that the musical resources outlined add to the possibilities of musical expression and are therefore vital potentialities, rather than merely cold facts.

My interest in the theory underlying new materials came about at first through wishing to explain to myself, as well as to others, why certain materials I felt impelled to use in composition, and which I instinctively felt to be legitimate, have genuine scientific and logical foundation. I therefore made an investigation into the laws of acoustics as applied to musical materials. Some of the results of the investigation convinced me that although my music itself preceded the knowledge of its theoretical explanation, there had been enough unconscious perception so that the means used were not only in accordance with acoustical law, but are perhaps the best way of amalgamating sounds formerly considered discords; namely, by sounding together a number of tones related through the higher reaches of the overtones, in the same spacing in which they occur in the overtone series. Some of the results of this probing into acoustical relationships form the basis for this work.

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It will readily be seen that the various fields opened up are merely suggested, and that a separate book would have to be written about each one of the subjects, such as polyharmony, polyrhythm, or tone-cluster, to make any detailed application of the principles shown. There are primary subjects other than those treated of here to which the same general method of procedure might be applied, opening up other new fields; and by applying the same process of development to a study of the possibilities of combining the primary elements dealt with in this work, a further extension may be made.

New Musical Resources was first written during 1919, with the literary assistance of Professor Samuel S. Seward, of Stanford University, to whom I am deeply indebted. In this early form it embraced most of the applications given here of the theory of musical relativity. Many of the materials which it predicted would come into music have since been adopted; many materials which were only vaguely suggested in music at the time, and which were pointed out as valid, have since been developed to such an extent that it is difficult to realize with what suspicion they were regarded in 1919. For example, the chapter on dissonant counterpoint was at that time a proposal that such a counterpoint be formulated. Since then Ruggles and Hindemith have been heralded as apostles of dissonant counterpoint, and Schönberg has brought to a clear focus the counterpoint which was a mere suggestion in his opus 11

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and other works of an earlier period. Similar developments have been made in many of the branches treated. Such progress is encouraging and seems to give further proof that the theory as postulated has validity.

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