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Eustace J. Breakspeare  
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MAY 2, 1887.

MR. CHAS. E. STEPHENS

IN THE CHAIR.

## ON CERTAIN NOVEL ASPECTS OF HARMONY.

BY EUSTACE J. BREAKSPEARE.

MELODY and Harmony in music are commonly held to be two distinct provinces. Strictly, however, the precise shares of the harmonic and melodic elements of the art are hardly to be separately evaluated, insomuch that a musical strain, even unaccompanied by supporting harmonies, has its underlying chord-structure, which the mental ear recognises and adds to the impression. All affecting such things as scales, keys, modulations, is essentially dependant upon a rightful appreciation of the harmonic relationship of sounds, and all questions raised thereupon pre-suppose the latter to a greater extent than is commonly imagined. Even the simplest melody contains its harmonic support, and the same, whether we are conscious of it or not, enters into the total impression of the strain. That most elementary of æsthetic principles in music—the antithesis of *concord* and *discord*—reposes upon this harmonic element. But, apart from this, the technical distribution and ordering of chords, from the simplest of consonances up to the most complex of dissonant combinations, at the same time that it calls for a certain differentiation of the study, requires a scientific or theoretic basis of the most accurate kind. However free art may be, on the whole, from theoretical control, there is yet no doubt that in this special department a wrongful theory may detrimentally influence the *material*, and through it, consequently, the technicalities and practice of the art.

The question is frequently raised, “How far may science be claimed to have the right to direct the practical steps of art?” To what extent are the empirical methods in art justified? Is science throughout relegated the task of coming in afterwards with its explanations and proofs, or may it be looked to for light in advance? In my opinion there comes a point at which science must resign and give place to the free, artistic selection—to the instinct, intuition,

or what we may term it—of the musician. Let me do my best to make understood one or two of those points, in connection with our present subject, as I view them.

If we refer to the oft-discussed music of the Greeks, we find here a decided instance of science determining prejudicially the development of the art, or, rather, I should say, fatally determining the ultimate arrest of that art. It is well understood how their "mathematical" measurement by perfect fifths resulted in the most painfully complex of musical systems. Like as in other arts, we find in music the natural elements before us; but it is in the work of selection from among these that just the difficulty lies. This may seem a truism, but I contend it is overlooked by those who imagine they have settled the question decisively in the finding of some natural principle which may accord with the facts already before them. How often has argument been raised upon the question, "Is our scale system presented to us in nature, or is it man's own invention?" They who argue that the same is nature's own model mistake, to my thinking, that use which has become a "second nature." It ought not to be difficult to perceive that a selection may be made after a part-arbitrary, part-intuitive manner, as I take our present system to have been, and yet all the time the process and results to be in conformity with natural laws. It is thus possible that even widely divergent systems might equally be justified in natural science. What some cannot be made to understand is, how a system may be both accordant with natural laws and yet no *necessity* to exist for precisely this and no other having been arrived at. The history of our art shows us that, for the greater part, the evolutionary process of scale formation has been one of gradual, tentative, experimental effort on the part of the artist; that, just in those instances where scientific deliberation has preceded and prevented the artistic choice—as we find it to have been in the case of the Greeks—the results, however perfect and satisfactory from the one aspect, have little benefited art, to say the least. This is not to say that science may not throw much valuable light upon the methods of the artist—by no means. We have simply to bear in mind that the *rapport* of art with science is a very delicate and critical one, and that it behoves the worker to be careful that no wrong leads are suggested or false inferences prosecuted, through some mistaken interference of science with art, outside its own specific boundary. In its own province science must rigidly prosecute its own methods; its examination of the physical side of art-phenomena is not to be interfered with, nor its results to be challenged; but, on the other hand, the musician—whether intuitively or with full conscious deliberation—is to be left free to "pick

and choose," if I may so term it, according to *his own* specific requirements. I will now endeavour to adduce some practical illustration of my so far abstract argument.

Had there been time I should have liked to trace the gradual growth of our present musical system; where the unfortunate mistakes had occurred—all the tale, indeed, of an almost blind groping after a safe and certain foundation for the art. I take there to be no more interesting study than this of the slow evolution of our present working elements in art. When we come to reflect that it was but 300 years ago that our twin major and minor modes at last asserted themselves from among the other artificial scale systems of the early Christian and mediæval ages; that, again, it was equally late in the day before the existing interval ratios of the scale became definitely settled\*—thanks to such pioneers as the early scientists Morales and Zarlino—no wonder, it seems to us, that music should be the "infant" among the arts. As to any properly theoretical knowledge of the laws regulating the disposition of notes in harmony, this was to come even much later still. As we all know, the first elementary definition of the simple "common chord," about the third or fourth decade of the last century, marked an important era in the history of musical science, and stamped Rameau as a mighty innovator.

Now it is just at this point where I should like to attach my moral. We have found that the elements of our modern art have been definitely brought into shape without much prior enlightenment from purely scientific research; that what there has been of scientific interference has in some instances proved most misleading—for I take it that if the Greek world possessed no "harmony," in anything like the proper sense of the term, it was owing to the fatal application of scientific assumptions. The question so often debated, whether harmony did or did not exist among the Greeks, may be disposed of by a simple reference to their impossible third. It is true that we—or some of us—at this day, might question whether two notes standing in the ratio 81: 64 does

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\* Very little, strangely, is taught upon this point in musical histories. We learn that, in the decadent period of the Greek nation, the old mathematical systems, as I have termed them, were set aside in favour of a certain sliding "semitonic" scale; that the scientists Didymus and Ptolemy did manage to "hit upon" the true ratios of the major and minor thirds, along with that of the major semitone, and, in fact, projected certain scales differing only from the modern upon the mere point of *ordering* of these ratios; but what the general system of scale measurement was, during the early Christian era, when the already obsolete Grecian modes had become resuscitated for church use—whether the recommendations of Didymus and Ptolemy were in any part followed out, or whether the old mathematical Greek tuning also obtained—the student is simply left uninformed. Though most careful distinctions of the different ecclesiastical modes are made, yet this important point is passed over as of no claim to mention.

indeed make such a cacophonous combination as to be altogether "impossible." But there is no doubt that the Greek scientists would condemn such, *à priori*, for the simple reason of its rational complexity, without any appeal to the ear. Their writer, Aristoxenus, seems to have been the first to enunciate the dictum that music was, after all, a thing for the ear, to be judged and discriminated of by that organ, rather than a subject for arithmetical calculations. Which teaching, of course, excited much hot opposition. I have no need to dwell longer upon the music of the ancients. I simply refer to the Greeks and their art in order to draw a certain lesson therefrom, for we shall find that very similar conditions present themselves, again at this present time, to those which disturbed the elegant musical Athenian of old—another illustration of the hackneyed adage, as to "nothing new" being "under the sun."

Much about the same time that musicians had begun to account theoretically for their chord combinations, scientists chanced also upon the discovery of certain laws in nature affecting the elementary musical material—that is to say, *sound*—itself. The efforts of Tartini, Sorge, among others, might almost be taken to mark a temporal division between the antique and modern in music, between the empirical and theoretical in musical teaching. The theorising of Rameau was restricted mainly to the simple triads, but the importance of even this advance for the time can hardly be overrated. Musical composition was undergoing a transformation from what has been styled the "horizontal" (that is to say, contrapuntal) into the modern "vertical" method. Instead of viewing a certain number of notes as *accidentally touching*, the total combination was now conceived of as a "chord." We find it difficult now to convey ourselves, even imaginatively, back into the spirit of a period when there was absolutely no conception of a harmonic unit; when all that held notes together in simultaneous sounding were certain empirical, cut-and-dried, contrapuntal *formula*, along with a certain traditionary method of combining the melodically independent parts of the score. The axiomatic rules the youngest pupil assigns to himself now, at the first lesson, were, as I say, astounding and revolutionary discoveries in 1730. We are only too apt to judge the phenomena of art from our present standpoints, bringing to bear the results of a lifetime of theoretical learning upon the work of a "rule of thumb" period.

*En passant*, I may refer to a certain misunderstanding of terms which seems to be very general. That is, as to what is properly a "theory" of music, and, more particularly, a theory of "harmony." I have seen a "theory of music" advertised which was nothing but a children's primer

of musical notation. Likewise the many "theories of harmony," when examined, come to resolve themselves into a collection of technical hints—for they are little more—as to the recognised methods in the way of forming, introducing, and resolving, the different varieties of chord tabulated. The student is informed wherein consists the difference between a "discord" and a "concord"—i.e., what particular combination of notes go to make the one, what the other; but how they actually come to be discord and concord, in the first place, nothing is said. Probably it is held that such information would be too abstract and out of place. I know no other study wherein the mere tabulation of the materials—and the dogmatic style of *recipe* as to their employment—would be so naïvely accepted for scientific theory as in the instance of the musical. The outcome of all this is, that they who have received empirical results in this take-it-all-for-granted style—who have accepted the mere hasty generalisations of practical effort as scientifically proven axioms—turn the most bigoted ear to any suspicion of a want of accuracy in that doctrine upon which they themselves have been fed, under the belief, all the while—poor, ridiculous mortals!—that they are thus defending the right Conservative policy, the true and only scientific "theory."

It must, of course, seem perfectly absurd to any student who has never examined more closely than this into the fundamental grounds of his belief, to have such questions posed as: "Why does your 'dominant seventh' have to descend—the whole chord, indeed, require to descend, upon a concord?" "How is it that the seventh is a discord, when a minor and major are concords?" "How comes the limit of consonance to be drawn in the one place rather than in the other; at the minor third, rather than at the harmonic ratio 7 : 6, or elsewhere?" These questions, I have found by experience, to have much the same effect on your properly graduated musical student as would the question, "Why does the sun shine?" or "Why does the earth revolve round the sun?" All such points upon which you try to raise argument are held to appertain to "first principles," it being impossible to get at any reason beyond.

Now, it seems to have been fated that ever since there became such a thing as "harmony," the strictly scientific appreciation of musical elements should, in the main, be kept distinct from the academical treatises; and just in the very place, unfortunately, where scientific inferences were sought, it became fated that musical theory, like that of the ancient Greeks, should take a woefully false step. Only recently have theorists commenced to sink their foundations a little deeper; nevertheless there remain, as I said at first, certain critical points upon which alone

the artistic choice is permitted—whereupon pure science is ineffectual. I presume such a treatise as that of Gottfried Weber might be proffered in example of the old empirical style of musical didactic writing. On the other hand, certain of the more scientific modern systems fail in not practically applying their teaching; that is to say, there is none or little working out, in technical shape, of the theories started. It was, as before said, a new era for musical theory when the natural laws of sound, especially that respecting "harmonics," became either discovered or better understood. Certain chords were seen to coincide with the harmonic series; that each single note acoustically contained within itself a whole triad. Here was, then, the natural justification for the musical scale and harmonies in vogue. So far, so good. But, unfortunately, the wrongful inference was drawn that, since the harmonics agreed with the *concordant* combination, they also afforded a reason for the antithetical, "discordant" combinations. The acoustical law, under which a vibrating string ever divides itself into an increasing number of sections, in strict arithmetical order, was now assumed to offer the source or model of all the more extreme musical combinations. This assumption, which seems to have been quietly and ingenuously made, and possibly for that reason all the more strongly impressed itself, I account to have been one of the most lamentably mistaken of all mistakes in or to do with art. It may not have had quite such fatal practical consequences as did the mistaken computations of Greek science, for the reason that the present scale systems had already been definitely fixed, in advance this time of the scientific element.

The common chord *C E G* is found, then, to be identical with the primary upper "partials" of a generating root *C*. Had they not proved identical I hardly fancy the harmonic theory could have been sustained. But having a start upon the triad, the theory rides easily and gaily over any inconsistencies and discrepancies further to be met with. Had any chord of four distinct sounds, say *g, b, d, f*, likewise agreed with the harmonic table, then there would have been still further proof afforded of an underlying and inevitable natural law. But, beyond the first elementary triad, there was no agreement or identity—though an escape has been made for this, in saying that the exigencies of "equal temperament" render the fourth note out of keeping with the actual harmonic, but that the ear must theoretically accept it for the true seventh, to which illusion the ear will accommodately lend itself. It is unfortunate that the question of chord derivation has been thus confused with that of "temperament"; and this, again, with that of a tonal reconstruction of the scale. Even some advanced



scientific writers seem to mistake the one question for the other. Our scales, and their interval ratios, have been adjusted after the well known order; any dispute hereupon is quite apart from questions concerning tuning and "temperament." In short, there is the *theoretical* scale, which is to be held as wholly unaffected by the practical exigencies of the keyboard; and, in any question of theory, we cannot escape any falsity by pleading a mere practical compromise. This is simply throwing dust into the student's eyes.

Mr. Chappell, for instance, in his "History of Music," would have us introduce the true harmonic  $F\sharp$  and  $B\flat$ , while sacrificing our present  $F$  and  $A$ , since they are rather harmonics of the lower  $F$  than of the tonic itself,  $C$ . That is, he goes upon the assumption that all the intervals of a scale should be harmonics of the tonic. Whether such intervals would all form concords he doesn't say; if some are to be discords, where, as I said before, is the distinction to be drawn; and, above all, what should impel a natural harmonic so strongly toward "resolution"? *Nature, we know, never resolves any of her harmonics.* Mistaken presumptions of this kind tend to affect and influence scientific speculations themselves. I presume that most musical scientists, by this time, have become imbued with the notion that the harmonic seventh and its resolution in music is a proved fact; and their future speculations would base themselves upon this assumption. Thus, we have perfected instruments in which the  $C-B\flat$  is made to correspond with the harmonic seventh (7:4); it is found "sweeter in quality" than the ordinary seventh (16:9), this perhaps ascribed to it as a virtue, and no question raised again as to why a harmonic 7 should either call for resolution, or, indeed, be classed among discords at all.

I have done my best to make clear that nature neither imposes dominant sevenths nor any other chords, for that matter, upon us; it is left to our free discrimination, or artistic perception, whether we choose this or that ratio for our scale. Thus, the notion of a natural harmonic combination of I., III., V., VII. (that is root, second, fourth, and sixth "partials") forming a chord. Well and good. What is to follow? "Oh, the 'resolution' of the chord." "But, stay—why should  $g\ b\ d$  be consonance; the  $f$  simply added turn it into dissonance?" The reply is, that the limit of consonance is drawn at the fifth and fourth harmonics in combination—the minor third, namely; while the sixth and fifth (and consequently the whole chord in which they enter) stand upon the other side of the border. But why so, we repeat; how is it decided that the line is drawn precisely in this place?

No reply we get, except perhaps an intimation that the interval gets too small here to be consonant. But, again we urge, was not the minor 3rd at one time similarly tabooed; and did not the Greeks exclude, as being too complex, all ratios higher than 4 : 3. It resolves itself, after all, into a question of *degree* rather than of *kind*. The only perfect concord, in a sense, is the octave, whose ratio is 2 : 1; all other intervals imply vibrational opposition; even the fifth is a discord in this sense; the minor third is thus one degree more complex than the major, and the lesser ratio 7 : 6 just one remove further than the minor third.

The German writer, Küster, defines "Harmony" as unity, and "Discord" or "disharmony" as "the expression of the loss of this unity, and the striving after the restoration of the same." Objectively considered, discords (I take it) result from the combinations of chords, or parts of the same, *having different roots*; and the resolution is the progression towards the nearest, or most convenient sounds, having common connection with the opposing elements.

It is my earnest desire to elicit some definite opinion upon the points here offered. The "novelty" of the theory promulgated by the authors, whom I will name, is not such in the sense of their being absolutely brand new; rather, in the sense that their ideas, though they may have been current elsewhere for some time, have yet, however, received little attention at home. The first writer, as far as I am aware, to break the conventional bonds was Moritz Hauptmann. Whether his work is read by musicians or not, I cannot say; certainly I find it very little discussed or even referred to. I may say that the "Metrik u. Harmonik," after I had overcome the rather formidable style of the author, appeared to me as a perfect masterpiece of artistic perception—in its own way as precious to the art as the "Wohltemperirtes Clavier" of Bach. It would take me too long to explain every point of what may be termed the Hauptmann theory of chords; I may at least convey the main ideas. Hauptmann holds that musical discord results from the conflict of opposing spheres or ranges of harmony. The harmonic *unit* is the triad—root, third, and fifth. An infinite extension of these triads is possible in either direction, the upper element of the one being identical with the base of the other, and *vice versâ*. Any chord out of this infinite range selected for central or tonic, will have its positive removes on the one hand—the chords which are generated from the tonic; on the other hand, the negative removes, or those from which the tonic itself springs. In this way we get both minor and major systems, the minor third being viewed as the major third from the upper note of the triad; the minor chord thus being a

"reflex" of the major. ["In the major triad  $C, e, G$ ,  $C-G$  is fifth,  $C-e$  third; the root  $C$  has fifth and third. In the  $A$  minor triad,  $a, C, e$ ,  $a-e$  is fifth,  $C-e$  third. The uniting moment (*Einheitsmoment*)  $E$  is here not a thing producing (*habendes*), but a thing produced (*gehabtes*);  $e$  is determined by, or dependent upon  $a$  as fifth,  $C$  as third; the tone which forms the connecting link of the two intervals is here not active, but passive, not a determining, but determined moment. The minor triad, for that very reason, has the nature and expression of dependence, of suffering. If we take one and the same tone, first viewed in its active principle, then, negatively, in its passive moment— $G$ , for example—we may represent it thus:—

$$\begin{array}{ccc} G, B, D. & C, e b, G. & \overleftarrow{C, e b, G.} \overrightarrow{b, D.} \\ \text{I} - \text{II} & \text{I} - \text{II} & \end{array}$$

$C, e b, G$  is the contradiction of  $G, b, D$ . In the latter,  $G$  has fifth and third; in the former,  $G$  is had from  $C$  as fifth, from  $e b$  as third"]. The tonic harmony with its first removes, positive and negative, which we call dominant and subdominant, underlie and afford the natural basis of the scale.\* All dissonant combinations proceed from the conflict of chords, or elements of chords, belonging to different removes. In the chord  $g, b, d, f$ , we have the first positive remove, with the single note  $f$  representing the whole triad  $f, a, c$ . The entire combination would result in the chord  $g, b, d, f, a, c$ —an extremely violent, though not impossible combination.† The elimination of, first the lower  $g$ , and next the  $b$ , give other chords of the 7th.

These, now, are the elementary points of a theory of musical discords, which, simple as it is, aims at the entire subversion of the theories now generally obtaining. These questions, before we can proceed further, must be put: Are the assumptions here correct? Is the important "chord of the dominant 7th" thus composed? Is the reason advanced for the requirement of discord-resolution—namely, in the inclination, or convergence of the two separated triads towards or upon that nearest harmony to which they stand commonly related—justifiable? Remember, that all this time the teachers of the present system afford no real explanation why "resolution" of a discord is called for—

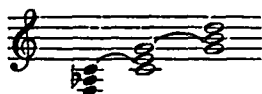
\* Thus, the ratio 4:3 (C-F) actually represents the chord of F; as likewise 5:3 (C-A). Given the vibrational ratio of any two sounds of a scale, we arrive at the harmonic generator.

† It is to be understood, by the way, that in order to bring these different triads into the required opposition they need to be inverted. To use them as they stand in the natural series would be ineffectual, just as the "harmonies" of any given sound set up no opposition among themselves. There they simply remain as they are formed in nature.

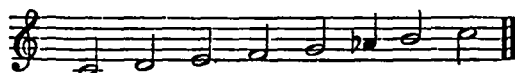
assuming that the elements of the chord all pertain to one and the same harmonic series—nor even in what resides the distinction between consonance and dissonance.

I may just complete this sketch of the Hauptmann system with one or two further particulars. Our author finds that certain of the major chords are combinable with minor in one and the same system. [Let us understand by "system," in this sense, a certain compass of these triads out of the infinite range—say to the limit of two removes, Positive and Negative, on each hand of any fixed tonic.]

Thus, a major tonic chord with minor negative chord—



This forms the harmonic basis of a certain hybrid form of scale, which Hauptmann terms the "Moll-Dur-Tonart" (major-minor scale), having as its peculiar intervals a major third with a minor sixth—



On the other hand, a minor tonic chord conditions always the *major* positive chord—since a minor chord on the dominant would be unfitted for resolution upon the tonic; at the same time, there is nothing forbidding the employment, otherwise, of a minor triad on the dominant, in minor keys.

Hauptmann stays here at the definition of the dominant seventh, and its various forms of inversion and resolution. I account the apparent lack of enquiry into his system to be owing to the philosophical abstruseness of his style of writing, he having tried to incorporate Hegel's theory of the "identity of contraries" with his system. The various relative aspects of dominant, tonic, and subdominant chords peculiarly favoured this sort of treatment. Though at first very forbidding to the student, he finds that, after all, the actual propositions themselves are simple and logical enough.\*

It will be perceived how these simple principles allow of development and systematic expansion. For example, under the same conditions which determine the entrance of the first

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\* I should mention that a simplified version of that portion of the work treating upon harmony (that upon rhythm being quite distinct) has been published since the author's death; completed and edited by Dr. Oscar Paul. Leipzig: Breitkopf u. Härtel. 1868.

positive and negative removes, so do the second removes enter into combination—



Here we have the triad of the second degree of remove in combination with one element (C) of the tonic chord. This discord, which we have commonly styled "the supertonic 7th," is resolvable either directly upon the tonic or upon the intermediate combination (P. I. with N. I.)

Mr. Parkinson, the author of the "Natural Principles of Harmony," curiously reproduced Hauptmann's theory, without being acquainted with the fact, I believe. Unfortunately, in this instance again, the treatment of a very simple theory was made so seemingly abstruse as, coupled with the high price of the book, to render the sale of the later very limited, I fear. The critics dismissed it as one among the many "faddy" theories upon this subject. If aught I can say will tend to excite better interest in this clever work, I shall be delighted.

Mr. C. E. Stephens (our present worthy chairman) who, we all know, has busied himself very greatly with this subject of harmonic theory, has also put forward, from time to time, certain propositions and suggestions in respect to the origin of these "mixed chords" which, it appeared to me, were very similar to those made by Hauptmann and again by Mr. Parkinson. I shall be glad to learn how far Mr. Stephens feels inclined to support the views already expressed.

In further completion of the musical "system" developed in the way described, it ought to be explained that each (contiguous) couple of the primary concords originate also a "secondary" chord, through a selection of the inner sounds. Thus:—



Here the major triads form minor "secondaries" between them, and *vice versâ*—



the minor primary chords give rise to major secondary chords.

The distinction should be well drawn between certain accidental (chromatic) elevations or depressions—in agreement with a law of melodic progression—which occur in some independent part, but which *inflect*, so to speak, the whole chord harmonically—between such, and the true, unaltered components of other triads in combination—*e.g.*, in the chord *G, B, D♯*, the sharpened *D* must be explained as the simple melodic *striving upward* of the natural *D* towards its ultimate *E*. This combination must not be confused with the possible chord *G, B, E♭*—wherein the *E♭* enters as the essential prime, third, or fifth of some other triad in combination with that of *G*; nor is the notation of these notes an indifferent matter. This *melodic interference*, so to call it, with the harmonic elements accounts for much that has long puzzled the musical theorist.

\* \* \* \*

Only recently has the harmonic element in music become cultivated with especial regard to its expressional significance. The older writers employed harmony rather in decorative purpose, as we might term it. In Mozart, and later on, still more perfectly in Schubert, a definite psychological meaning becomes attached to the harmonic side of their music; and, moreover, chords are employed in a more independent sense and value. Certain writers show a comparative poverty of invention in the handling and treatment of chords, while others, more attracted by this element, tend perhaps to *mannerism* even in their continual devices of chromatic harmony. Likewise, a similar contrast can be noticed among *listeners*; while some are attracted, alone, by a pleasing melody—almost unconscious, indeed, of any other musical ingredient being present—others will take an extreme, and equally one-sided pleasure in the composer's artful involutions and devices of harmony and modulation. I am bound to say, however, that the latter are very much in the minority. The Italian people, on the whole, are noted for their deficient sense of the beauties of harmony: the simple

Each independent chord conveys its own definite æsthetic impression, impossible though it be to translate the same into words. All combinations containing chromatic elevations—*e.g.*, the "augmented 5th"—may be said to convey the feeling of forward-striving; but it would be absurd to attempt to describe each harmonic combination after this manner. Again, each "inversion" of the same dissonant or consonant group differs, by some subtle æsthetic nuance, from the others; compare, *e.g.*, the mildly-pungent

## DISCUSSION.

(The vote of thanks was carried unanimously.)

The CHAIRMAN.—As no one has risen in answer to our lecturer's invitation to discuss the paper, I may say that it is perfectly true that I have thought much on this subject, and in a lecture which I read some years ago here, adverse to the theory of Dr. Day, I promulgated to a certain extent a system of my own, which I am positively startled to-day by finding is almost identical with that published some years ago by Hauptmann. Mr. Breakspeare said that it had not made its way, and probably a great many musicians had not

heard of it. I confess to not having done so myself, but there is a startling coincidence in the principles upon which he starts. I think it must be borne in mind that in the selection of harmonics for a theory, we must impose a limit upon ourselves. Mr. Breakspeare only went as far as the seventh and said that is not a discord, nor should it be called a discord, when the sixth, which is also a product of the same note, is not called a discord. He might have gone much further, the harmonics do not stop at the seventh, the ninth, the eleventh, or any number, they are absolutely illimitable, and consequently a process of selection must take place. In my theory, which is so identical with that of Dr. Hauptmann, I stop at the very interval which gives us all this trouble, that is the harmonic seventh; that is to say, I make that my barrier, and do not use it, I adopt simply the three notes which form the triad, which, as everyone must feel, are the elements of our chord system. Given then C, E, G, or rather I will take the dominant chord, G, B, D, in the key of C major, we are told when you add F it is a discord, but if that discord be derived from the same root as the fifth, there is no reason why it should be a discord any more than the fifth. I believe that is your argument, Mr. Breakspeare?

MR. BREAKSPEARE.—Exactly.

THE CHAIRMAN.—But suppose it is derived from another root, a subdominant root instead of the dominant, and superposed, as Mr. Breakspeare has shown us, you have a reason for calling it a discord, because it is a note borrowed from another root. My theory is a very simple one indeed. The subdominant, as it is very properly called, implies a governing note below the key note; that I hold in the key of C to be F; F, A, C gives a triad below, then C, E, G, and the next superposed triad is G, B, D. Now all those notes are derivable from the lowest, and as they rise in this manner, so I maintain they are capable of being used in combination. Now the Day theory, I must do it the credit of saying, is one of the few in which a serious attempt is made to account for the difficulties of musical theory, but some chords it does not deal with at all; for instance, the chord of the eleventh on the subdominant, thus, F, A, C, E, G, B. I give the chord in its entirety; but eliminating the warring elements of that chord, you have a chord that is not provided for at all in the Day theory. I call that chord the eleventh on the subdominant; it is a very beautiful chord, provided, by the derivation I have assumed, from the subdominant, with the tonic as the centre, and the superdominant or overdominant of the key. Another further argument in support of my view is this, a dominant chord followed by a tonic chord is not thoroughly indicative of a key. If you play a chord of C, followed by a chord of G, no one shall say



that it is in the key of C more than in the key of G, it may be either one or the other; but the moment you add the remove on the other side—and I think the word is a very good one, it is my own word—the moment you have the note that forms the distinctive characteristic of the chord on the other side that is indicative, and you immediately have a note which determines the key. It is those three chords, which can positively determine the tonality of the key; if you have C followed by G, it may be in G, or it may be in C ending on the dominant; but the moment you incorporate with it only one note of the subdominant chord, it immediately fixes the tonality. I think it only just, although I so widely differ from Dr. Day's theory, to say that he must have devoted considerable attention and considerable thought, and a great amount of skill to it; it has commended itself to the notice of our very distinguished musician Sir George Macfarren, and, therefore, there must be something in it, but I have yet to learn to appreciate it as he does. Nevertheless, I look upon it as an earnest endeavour to carry out what was never thoroughly done in this country, or, to my knowledge, in any other. The other theory, that to which Mr. Breakspeare alluded, was that of Parkinson, a music-seller of Manchester, which I really think is one of the cleverest books of the kind that I ever saw. He proceeded on somewhat different lines, but in the main he takes some of the views that Mr. Breakspeare has shown as being used by Hauptmann. When I heard Mr. Breakspeare to-day I was tempted to ask him at what period this work of Hauptmann was published, and was endeavouring to persuade myself that possibly my ideas had somehow got abroad and had been adopted, for the startling coincidence between the views I promulgated, as I have already observed, was most extraordinary. I have endeavoured very imperfectly to show you how I coincide with these views with regard to the derivation of minor thirds, which is one of the crucial points in music. I have to thank you very much for the kindness with which you have listened to me; I feel very proud that so eminent an authority should have corroborated the views which I myself have entertained without knowing that he had come to similar conclusions.

Dr. VINCENT.—May I ask if it is absolutely necessary to have a theory in the present state of music? In the present state of our tempered scale is it not quite enough to know the scale as we have it, and from that scale to build the necessary combinations which all great composers tell us are acceptable to them?

The CHAIRMAN.—My answer to that would be simply this, I think we ought to have some reason for the faith that is in us, and when you say "taking the scale as you find it," that

is a purely empirical view of the whole affair, because any one appealing to you on the subject might turn round and say, oh, the scale might have been anything else but what it is. Now, the derivation that I have shown you here gives the identical scale precisely as it exists for our use, thereby proving that nature and our scale are not at discord with each other. I think if Dr. Vincent's views were carried out it would result in this, that every one would invent his own scale, and compose in it as he pleased; that could hardly be considered satisfactory. I think Dr. Vincent will admit that nature gives us so much of our present scale—as I have said, it gives us the whole of it, it gives us the intervals that we use, and I think it would be unsafe to discard so great a guide as nature herself.

Dr. VINCENT.—I might add one remark which I forgot. The first theory of music—the first book on music that I studied theoretically was a German system, in which there were nine notes in the scale—a sharp fourth being added.

The CHAIRMAN.—Was that in the minor?

Dr. VINCENT.—No, in the major, the sharp fourth treated as an ordinary scalar note. In that scale every possible harmony can be accounted for with great ease; that is to say, that you can take a scale, and from it account for every harmony with ease, for the practical purposes of teaching harmony, for writing, and for thinking of it. Of course I know it is outside of the question as to deriving a theory from nature, and, therefore, I feel that my remarks are not quite in order.

The CHAIRMAN.—You are speaking of the Abbé Vogler's system, I think.

Mr. SOUTHGATE.—One would like to have Mr. Stephens's opinion, as an authority who is very widely respected, as to whether there is really any finality in the system of notation, or rather of the notes of the scale as we have them now; for it seems to me that, after all, the scale, with its semitonal divisions, has been gradually built up. I take it, it was not so originally; these sub-divisions were gradually added. One knows that practically at the present time there are minute divisions which are made by violinists and persons who play on stringed instruments with regard to D sharp and E flat which are not made on keyed instruments, but with which nevertheless we are quite satisfied. Is it not possible that we might go on using those intervals, accompanying them by others, or new or modified harmonies; if that be the case, the scale, as it exists at present, and the number of notes in it, will no longer be complete for the purpose of music? In that event, I take it, they can hardly be derived from the vibrating string, because the intervals are not quite accurate with any mathematical division that we choose

to make of them. Is it not possible then that those who hear them will gradually become attuned to these new intervals, and like them just the same as we hear with pleasure intervals and chords that our forefathers could not possibly have been satisfied with?

MR. BREAKSPEARE.—I beg to suggest that all intervals, however minute, must accord with some section of a string in vibration.

THE CHAIRMAN.—The difficulty in answering Mr. Southgate's question is this, if we pursue it to its logical conclusion, it is really the adoption of anything you please, as I said before. Instead of that I feel that our major and minor thirds are all derived from nature, and although the D sharp and E flat may be found to be different in pitch, of course that is really the case, and those two intervals doubtless may really be used in just intonation; but the compromise of equal temperament is certainly a very useful one, and even violinists who are able to play any pitch they please for a note—I think even to them it is a great boon, because if they do not play E flat and D sharp pretty nearly the same, they would require the bass part as well as the melody to know the root they were playing from. It has been claimed for some that they do make a difference, but really to make this difference exact they would require to have the root presented to them at the same time, and that you know would be utterly impossible, or, if it were possible, would add complications in the way of the artist.

MR. SOUTHGATE.—It may be remembered that Colonel Thompson, in his organ, endeavoured to do that, he had some forty notes in the octave, which he maintained gave just intonation; but I believe he found that a certain amount of compromise was still required; indeed, no perfect keyed instrument can be made.

DR. VINCENT.—In the Hauptmann system, do you allow only one root to start from?

THE CHAIRMAN.—No, three roots for each key.

DR. VINCENT.—Where do you get the dominant key from? You have the tonic, but where do you get the subdominant root from?

MR. BREAKSPEARE.—The subdominant is the generator of the tonic.

DR. VINCENT.—Then you begin a key in every tonic harmony from the subdominant root.

THE CHAIRMAN.—I assume the tonic root, not the subdominant. You must take something to begin with.

DR. VINCENT.—Assuming the tonic root, where do you get the subdominant from?

THE CHAIRMAN.—In this way, in the key of C, the first triad is C, E, G, then from G I get G, B, D; there you get

to the extent of your resources in the same direction. Looking the other way, backwards as well as forwards, I get that which forms a similar combination below the central point, and so I surround the root by its various relatives.

Dr. VINCENT.—That is very interesting, but I do not think it is logical.

Mr. BREAKSPEARE.—It is logical, because it is already existent. It is the principle which governs the formation of chords.

Dr. VINCENT.—Then I think my remarks were quite in order. If you are going to allow that view just because it is logical, because it already exists, I say our scale already exists, and from that you can derive everything.

Mr. BREAKSPEARE.—It exists, but in what way?—as an artificial product? I view it as a natural, harmonically supported scale.

The CHAIRMAN.—Treat your tonic as the central point and surround it.

Dr. VINCENT.—I think there is a difficulty in getting the subdominant root naturally from tonic harmony.

Mr. BREAKSPEARE.—I think, as no one else wishes to speak on the subject, I must, in the first place, return you my thanks for the kind attention with which you have listened to the paper. I am very gratified, of course, to find that Mr. Stephens bears out my remarks, and that the doctrine I have favoured coincides with his own. I do not think he need regret in any way having been anticipated by Hauptmann, for it is with this theory as with many others, perhaps they await practical fulfilment, and there is sufficient room now for some one—especially one who has the experience of Mr. Stephens—to form a perfect system. You may remember I, to some extent, anticipated that objection as to the practical non-agreement of a tonal system derived in this way from roots with a tempered system, in which are twelve equal semitones or, perhaps, still further minute divisions of the scale. I should have liked to explain myself on that point a little more, but I can only repeat, to some extent, what I have already said, that so long as we employ chords in combination we must furnish a reason of some sort for that combination. If you simply divide the extent of an octave into I do not care how many divisions, and you then proceed to combine the notes thus formed, you are just in the same predicament as before; you must have some system upon which you combine those notes. There still must be roots of chords. It seems to me that we need not go searching for the more difficult, while, to my mind at least, there lies at our door such a simple reason as this given for the scale and its formation. Mr. Stephens has explained, and I unfortunately omitted that point, that the three primary triads

of the tonic, subdominant, and dominant exactly furnish the notes of the scale, and that in both minor and major modes. I repeat, what need have we for imagining further difficulties which might arise with more minute divisions until we are obliged? Why should we assume those difficulties, as we still have to work under the present system? \* Let us, at any rate, be content to find some logical reason for the system at present in use. I have already argued that all questions of temperament have nothing at all to do with the question of the theoretical derivation of chords. I do not think there is anything more I can say. If that point has unfortunately not been sufficiently explained, I can only regret it; but I certainly did not think you would have any difficulty in accepting that statement—namely, that all difficulties connected with tuning and the equal division of the octave have nothing whatever to do with this system of chord writing.

Mr. SOUTHGATE then proposed a vote of thanks to the Chairman, which was carried unanimously.

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\* If our present scale *is*, indeed, naturally founded upon a harmonic system, such as explained, any future extension of the scale-material can only be possible in that direction where these elementary harmonic principles shall still rule the same as before.—E. J. B.

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