

Review

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Queen said all that was courteous, but I was annoyed, for I was far from being satisfied with myself, and I am resolved never again to extemporise in public. It is both an abuse and an absurdity." With these words the Munich letters end, to be followed by a set from Paris, which demand and deserve a chapter to themselves.

(To be continued.)

#### THE PHILOSOPHY OF MUSIC.\*

THE word "philosophy" or "philosophic" has evidently an attraction of kinship in the mind of Dr. Pole. He uses it continually. He speaks of the "philosophic method" of employing logarithms in musical calculations; and of "philosophic scales," meaning, we presume, those arrangements in brass or ivory in certain boxes of "philosophical instruments." The old use of the word still exists in the term "natural philosophy" we use instead of natural science; but as a rule the present generation, rightly or wrongly, would look upon the word philosophy or philosophic in too ordinary an application as somewhat antiquated. Dr. Pole however defines very clearly what he means by "The Philosophy of Music," that is to say, a mode of inquiry into the principles of the art "claiming attention on intellectual rather than on utilitarian grounds." The greatest composers that ever lived, as he says, may have known nothing of acoustics or of fundamental philosophical principles, and that all they possessed or required was a practical knowledge of their art; but "the argument," Dr. Pole adds, "that would restrict a man's acquirements to those things he needs for earning his livelihood is worthy only of a barbarous age." Moreover, judging from the facts and examples he quotes, it is clear that Dr. Pole wishes us to understand that an inquiry into the first principles of music is not only an intellectual indulgence, but it has one practical if negative value in enabling us to prove that many of the current technical theories of musicians which they assume to be founded on some law of nature, some particular natural phenomenon or scrap of science, are mere hallucinations.

Dr. Pole's work is at least opportune. Since the publication of the theories of Helmholtz, their bearing on the scientific basis of music has been explained and re-explained until we have had a surfeit of the very names "upper partials" and "differentials," "roughnesses" and "smoothnesses." What English musical students have been waiting for is a practical and technical treatise incorporating the theories of Helmholtz, and logically extending the system of music of which he himself has given only a bare outline. The present work does not pretend to be a technical treatise, but it certainly does supply to some extent the want we have referred to. It is the first English book that, less from an acoustical than an artistic and technical point of view, endeavours to treat the theory of music "as illustrated by the late researches of Helmholtz."

It contains the substance of a course of lectures delivered at the Royal Institution in February and March, 1877; and is divided into three parts, the "Material of Music," the "Elementary Arrangements of the Material," and the "Structure of Music." These three divisions may be said to represent respectively the acoustical basis of music, the questions of intervals and scales, and melody, harmony, and counterpoint. The greater portion of the work is a well-selected compilation of scientific, historical, and tech-

nical facts. The Helmholtzian philosophy it comprises is principally taken from chapters xiv. and xix. of "Sensations of Tone."

Dr. Pole's own summary of his philosophy will to many readers be disappointing. It amounts very much to the old lament, that "all we know is, that we know nothing." Those amongst us who had imagined that the discoveries of Helmholtz would revolutionise the art of musical composition, or that we were about to have a new heaven and a new earth in the realm of sound, will be grieved to learn that what we are pleased to call the "natural scale," or the "modern diatonic scale," is the same diatonic scale established by the Greeks more than two thousand years ago, subjected to "slight alterations" for modern harmony purposes; that there is no "natural necessity" for any particular series of sounds we call a scale, and that artificial as the scale is and must be, it is the first element in any system of music, and music is impossible without it; that our modern diatonic chords come from the counterpoint of our ancestors, and that chromatic chords are derived by the same principle long since referred to, but in a much more general sense, by Dr. Hullah as that of "stratification." If we attempt to give our chords an independent existence, we find that just as in the horizontal scale we are limited in our search for anything like a fixed or natural basis or framework to the two or three relatively perfect consonances, and that beyond everything is vague and unsettled, so in the vertical harmony, when we pass the *triad*, although by the new theories we know why it is that one dissonant interval is rougher or smoother or a better or worse quality than another—if, for example, it be a question of choice between three minor sevenths, we as often as not take the worst of the three, and rarely or never do we take the best, except under another name (a high augmented sixth), and in a different tonal connection, and with a slightly different ratio. In our more important dissonant combinations, we take a minor seventh of medium quality, and not on account of its quality, but by reason of its position in the scale. In short, as Dr. Pole reminds us, "music is an art" dependent on no particular acoustical or physiological principle, but on a tissue of principles harmonic, melodic, rhythmical, esthetical, and structural; and, as he says, if harsh combinations opposed to the merely harmonic principle are occasionally tolerated, it is because "at the time they occur some other element of musical interest is offered prominently to the mind."

In summing up the evidence—physical, esthetical, and mechanical—Dr. Pole sometimes takes one point of view and sometimes another, with an impartiality which bestows on his work its chief value. He is careful to separate the collectors and classifiers in the sciences from philosophers, and draws a broad line between the technical theories of music and a general system or theory of harmony. There are certain classifiers in technical musical theory for whom he has a particular commiseration. He would call them "searchers for roots," and he cannot imagine why we should not take any combination the composer chooses to offer without endeavouring to account for it. We confess we do not see the wisdom of the observation, because all Dr. Pole's labour in interpreting for our behoof the discoveries of Helmholtz seems directed to that very end. If the "philosophic method" fails, we must fall back on merely musical methods of analysis. Unless we simply copy the combination the composer gives to us, we must dissect it in some way, or we cannot use it in a different context. If we are to employ it always in the same context we fall into the supposed

\* "The Philosophy of Music," by William Pole, F.R.S., F.R.S.E., Mus. Doc. Oxon., &c. (Vol. xi. of "The English and Foreign Philosophical Library.") Trübner and Co., London, 1879.

error Dr. Pole elsewhere condemns of prescribing particular resolutions for particular combinations. He tells us, for example, there are nine resolutions of the chord of the dominant seventh. We have not verified the calculation; but supposing there are nineteen, they must all be on one or two principles we have to find out. The truth is, Dr. Pole reminds us of two principles of resolution, one of which is melodic and the other, strange to say, is a question of root—that is, of the "*Basses fondamentales*" of Rameau, to which he refers in analysing the chord of the dominant seventh, and in endeavouring from its structure or harmonic elements to eliminate some principle of resolution.

In chapter xvii. he acknowledges that harmony in its full modern sense is a very complicated affair, and as the variety of combinations differ exceedingly in character, their scientific analysis is of a very intricate nature. He attacks the difficulty in this way: he divides chords into separate intervals he calls "binary combinations." If the separate intervals are what musicians more or less unscientifically call "consonant," the chord is consonant; if any of the separate intervals are dissonant, the chord is dissonant.

With the intervals, the *fifth* and the *third*, he forms a *major triad*, which he admits has a "root," even using the word in a special acceptance as "generator" or "fundamental." It is in this latter sense he objects generally to the use of the word "root," because no other chord but the major triad can be derived by the process of harmonic generation adopted by Rameau, and extended by some of his immediate successors to the derivation of chords containing sounds beyond the sixth partial. He reminds us that Rameau does not attempt to assert that his chord of the dominant seventh is anything more than an *ouvrage de l'art* in some measure "indicated" by nature. Dr. Pole adds that "Helmholtz takes another view." For our parts we do not see that Helmholtz has contributed one shred to that particular question. He leaves it precisely as it was left by Rameau. When, as Dr. Pole says, Helmholtz "somewhat doubtfully" admits that the chord can be regarded as a "representative of a compound tone," he simply in other words repeats what Rameau had stated. Helmholtz makes the same partial and unwilling admission in favour of the *chord of the ninth*; and we must acknowledge if either is to be accepted as a representative of a compound tone, both being out of scale, there is no scientific reason why we should not proceed in the series as far as the *thirteenth*; and if that harmonic happens to be minor and out of gear, we can make it major or change the ratio according to our requirements, as we absolutely do in some theories still in vogue. When Dr. Pole and other philosophers chide the musician and the technical theorist for being the victims of subjective views and creatures of custom, we may ask, why do the philosophers insist upon calling the seventh partial a "seventh" at all? Why not a "sharp sixth"? as many French theorists call it, and as curiously enough the philosophers use it themselves when it becomes a question in the common notation of chords.

Dr. Pole complains that English theorists take the root of the major triad as the root also of the minor triad. Are we to infer that continental theorists do not? From an allusion to the nineteenth harmonic, we assume that Dr. Pole is mentally referring to the late Mr. Hewitt. No other theorist we know of employs the term "root" of a minor triad except as a nominal or technical expression, and to fix the position of the chord in the scale for the musician's purposes. In that sense not only continental theorists

but Helmholtz and Dr. Pole himself use the same expression. As to the Rameau-Helmholtzian mystification in regard to the intrusion of  $E\flat$  in the "minor triad" of C or of C in the major triad of  $E\flat$ , and the "great sixth" on the sub-dominant and so forth, it all ends in two or more roots; which, considering Dr. Pole's general objection to one, rather reminds us of the "two flutes."

By the system he has partially adopted, not only chords but intervals, or, as he chooses to call them, "binary compounds," have roots; the peculiarity of the major triad being that its characteristic intervals, the "fifth" and the "third," have a common and real root. Perhaps the most unphilosophical device in the whole technical theory of music is the system of numbering chords in the old and happily nearly extinct method called "figured bass" or "thorough-bass." If we number the first inversion of a major triad  $3\flat 6\flat$  as the intervals indicate, instead of 3. 6., we see at once in another form the Rameau-Helmholtzian difficulty referred to. The new numbering shows that, taking the  $E\flat$  in the major triad of  $C\sharp$  as a nominal root or bass, we modulate into E minor. The use of the word "inversion" in the sense musicians employ it ought to be discontinued. What are called the different inversions of chords should be the different "positions"; reserving the word "inversion" to denote a musical device altogether distinct.

The number of separate intervals, Dr. Pole says, is theoretically infinite, but, following Helmholtz, he adds, "it must be recollected we have a definite musical scale on which we agree to form our music." We are to understand that, if we combine intervals of different scales, our chords are formed of different tonalities. This principle he attributes to Rameau; but Rameau, we think, refers all "binary compounds" to their position in the triad of which they are components. For example, Dr. Pole instances the formation of a chord of the *diminished seventh* according to the principles of Rameau by joining together the diminished triads of the scales of C and  $E\flat$ . Such a method could only hold water in equal temperament. If it is a question of ratio the two F. F. in the combination are incompatible. It is better perhaps to leave the triad out of the question, and take from each scale the characteristic interval, the *sharp fourth* or its inversion, the *flat fifth*, either of which by most continental harmonists is classified as a *tritone*.

When it comes to a question of resolution, Dr. Pole reduces the chord of the seventh on the dominant to its constituent elements—the fifth and the tritone; with also the resulting or intermediate intervals, the major and minor thirds and the minor seventh. We give preference to the first two because, when we resolve the tritone, we resolve all the rest of the intervals except the fifth. His two principles of resolution are the harmonic relationship, "in a general sense," as he is careful to add, and the mechanical or melodic principle of the least movement of the parts of the chord. "That," he tells us, "is really as far as philosophical first principles can go"; and it must be confessed the acknowledgment is rather humiliating. The philosophy of the subject is this, that "there is no physical reason whatever for the particular resolution of a chord." The physics or physiology of the question ends with the necessity for the resolution at all of dissonant intervals, the necessity arising from their irritating effect on the nerves. We are, however, in this dilemma, that as the new philosophy has proved there is only one consonant interval, the octave, all chords are more or less dissonant. It is a question of degree of dissonance; and in just intonation the intervals are very difficult to classify technically according to the new theories and with the "numeri-

cal values" Helmholtz has given as a measure of the relative dissonant effects of each. The very essence of the Helmholtzian philosophy, to our notion, is that pure consonance is vapid. Simple sounds, we are told, are impossible in music, from the fact that the intervals they give are so consonant or so smooth we cannot tell one from the other. Therein is the true "philosophical reason" for the prohibition of consecutive fifths and octaves, and, to a certain extent, fourths. Those intervals are relatively the most consonant; and in music, that is, in the motion of the chords or movement of the parts of the counterpoint, they are the least effective.

Dr. Pole, we think, spends more space than the subject is worth in totalling up the numerical values of intervals to find the sum of dissonance in a chord. Helmholtz only gives the numerical values as a further illustration of his Diagram 61. Most of us have gone into the same calculations and with the same object as Dr. Pole; but were all the elements of dissonance discovered and carefully taken into account, the result would be applicable only to certain conditions in regard to pitch, intensity, and quality, which, as Dr. Pole himself would be the first to acknowledge, cannot practically coexist for one instant in music. Moreover the calculations do not appear to be very reliable.

Mr. Ellis, the translator of Helmholtz, objects to the numerical value of the high augmented sixth, which, contrary to the calculations of Helmholtz, he finds more dissonant than the minor sixth when the two intervals are compared on a justly intoned instrument.

There is one rather remarkable omission in Dr. Pole's otherwise powerful condensation and focussing of the theories of Helmholtz. The omission may be accidental or by design. In tracing the history of the scale and the influences which have prompted the ear to fix on certain divisions or melodic steps, he gives Helmholtz the credit of discovering that those influences resided in the *nature of the sounds themselves*. Dr. Pole's readers might, from his explanations, infer that the physical origin of the scale is in the upper partials of the single sound; whereas, as we understand Helmholtz, he employs those intervals only to suggest the origin of the octave, and perhaps its first division by a fifth. When it is required to account for the *fourth* and the consequent tetrachordal framework of the scale, Dr. Pole seems to fall back on the *under-fifth*. Helmholtz tells us expressly there is no occasion to resort to that old method, as by another principle, by which we can also obtain the fifth, we get the fourth. That principle is not in the occurrence of certain upper partials in a single complex sound, but in the coincidence of the upper partials of two sounds. On that principle is founded the Helmholtzian law of "affinity of sounds," and the elimination of diatonic scales. Although in that law he might perhaps have found a new principle of resolution, Dr. Pole seems to us to pass it over and hurry on to his own diagram or "graphic representation" of the scale, where we return to old mathematical theories of harmonic relations and simple ratios.

When we finally arrive at purely musical questions, and, according to his own method, derive our chords from "binary compounds" in the scale or in allied scales, he is distressed at the notion of transforming a chord of the dominant seventh into a chord of the diminished seventh by the unphilosophic process of "sharpening the root"; as if, as he says, there were any "scientific connection" between an F and an F $\sharp$ , or a B $\flat$  and a B $\sharp$ . But apart from the younger school of Helmholtzian transcendentalists he is encouraging, who would ignore "augmentations" and

"diminutions," and even the scale itself, the "harmonic connections" are already settled in the structure of the scales from the materials of which Dr. Pole has agreed to form his chords. He uses and approves the *minor-major* mode. The mere conversion of the minor mode into the minor-major quietly effects the very chord transmutation he condemns. We cannot see that, so long as keys and modes are permitted to exist, any system of notation, however philosophic, can avoid the relativity understood in the expression F and F $\sharp$ . The F $\sharp$  or *fe* is purely a *fixed Doh* symbol; but the modern notation admits of our calling *fe, me, or te*, as Dr. Pole would treat it.

We are only concerned here with technicalities as far as they illustrate the philosophy of music; and we know no point in which "philosophical first principles" seem more adrift than in the interval called an "augmented sixth"—so often represented by the very F $\sharp$  in question—and the chords which derive their name from that interval. Dr. Pole himself, in his method of classifying those chords, all on the root F $\flat$  looking very like the subdominant of C $\sharp$ , evidently gets into a technical dilemma in his "fourth form." He is, however, in good company; for there is something of the same kind of difficulty in an example he quotes from Helmholtz, where it is intended to show that those chords are remains of the ancient Dorian mode. For his immediate purpose Helmholtz takes the inversion of the modern scale of E $\sharp$  major to represent more or less the "mode of the third" in C $\sharp$ . With the "leading note" and the "minor supertonic" of E $\sharp$  he gets a "high augmented sixth, F—D $\sharp$ , which transposed to C $\sharp$  is D $\flat$ —B $\sharp$ . As Dr. Pole discovered in his "fourth form," a chord not in its normal position and containing that interval is not necessarily "a chord of the augmented sixth"; and the "philosophic inquiry" has often suggested itself to musicians—is there such a thing at all as a "chord of the augmented sixth"?

The philosophy of music, as explained by Dr. Pole, amounts to the acknowledgment that beyond the dissection of the crude and amorphous materials, science is comparatively impotent in art questions; just as philosophy itself fails when it attempts to analyse either the genius which shapes and puts the materials together, or the esthetical effects of the simplest melody or well-ordered succession of chords.

Such a frank admission does not absolve the student from listening, as Dr. Pole says, "with respect" to everything that a man like Helmholtz has to tell us from the scientific, esthetical, or practical side of music.

If, as Dr. Pole seems to deplore in his opening chapter, the greatest share of our attention is directed to the "performance of music," then indeed we need not trouble ourselves with its philosophy. If we wish to comprehend or to compose music, we must remember that much of the information we derive from musicians themselves is of little direct assistance, and, apart from its special object, worthless; whilst the information we obtain from a scientific work on music, if of less direct assistance to the artist, is in itself valuable knowledge. From all points of view, and from different sources, Dr. Pole has thoughtfully collected the facts and opinions bearing just on those parts of the whole subject treated by Helmholtz which are most interesting to the musical student. The "Philosophy of Music" will be read with eagerness by a large class of readers who might turn over with a certain impatience the laboriously reasoned pages of Helmholtz.

THE Queen has been pleased to appoint the following gentlemen to serve on the Royal Commission on the Cathedral Establishments: The Archbishop