

MODERN MUSIC SUPPLEMENT

THE FUTURE OF TONALITY

Tonality and Atonality as Synthesized
By Supra-Tonality

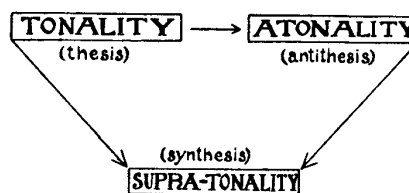
JOSEPH YASSER

A COMPARISON of the three musical concepts in this subtitle with the three “evolutionary stages” constituting the Hegelian dialectic triad—Thesis, Antithesis, Synthesis—is too inviting not to be made here. Indeed there is much more than a similarity merely of form between these two groups of entities, although it is not always obvious.

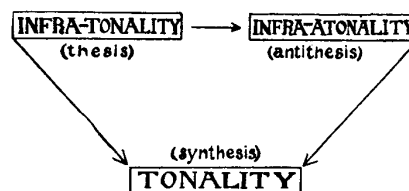
It can hardly be denied that Tonality and Atonality actually represent a certain Thesis and an Antithesis in the history of music, at least of our Western music. But the prediction that they will eventually be synthesized by Supra-Tonality must be substantiated by something more than assertion or philosophic comparison. Proof is necessary, above all historical proof. For if adoption of the dialectic method in considering the process of musical evolution is correct then the initial link of this dialectic chain, i.e. Tonality, which serves as a Thesis, must apart from that and in itself represent the

Synthesis of a certain pre-existing and less complicated Tonality, which we may therefore call “Infra-Tonality,” antithesized by a pre-existing, less complicated Atonality, which we will accordingly call “Infra-Atonality.”

In other words, the proposition to be demonstrated is that, strictly speaking, our prediction, which may be diagrammatically represented as

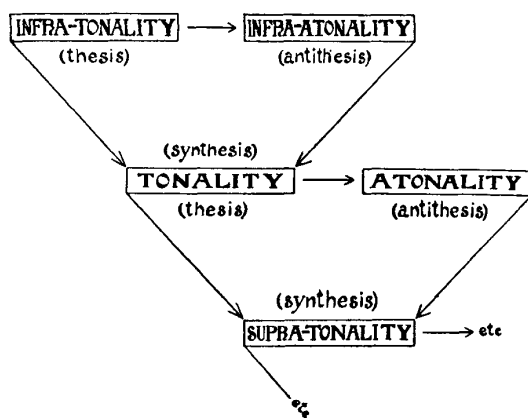


had an historical precedent which may be similarly represented as



the natural interconnection of these two schemes forming one continu-

ous evolutionary chain with Tonality as a connecting center :



This chain could, of course, be theoretically extended *ad infinitum*, Supra-Tonality being antithesized by Supra-Atonality and both of them synthesized by some still more complicated "Hyper-Supra-Tonality," and so on. But for our immediate purposes the above section of this infinite chain will suffice, let alone the fact that too remote predictions would have, at present, no practical meaning.

WHAT IS TONALITY?

With this limitation, our problem is now fairly well formulated and apparently contains three unknown and two known quantities, the former group being Infra-Tonality, Infra-Atonality and Supra-Tonality, and the latter Tonality and Atonality. A definition, as exact as possible, of these two known quantities is naturally the first step toward the solution of our problem. What *is* Tonality? What *is* Atonality?

There are a good many definitions of Tonality, all more or less correct but none completely covering this rather vague concept. Without claiming to fill the gap or fully to express this notion in a single comprehensive and universal formula, I shall offer

my own which at least will more adequately serve our purpose:

Tonality is a principle which organically and tonocentrically unites the melodic and harmonic functions of a certain number of systematically arranged sounds as most simply represented in a musical scale.

To expand this definition and describe the two functional aspects in reference to our present (diatonic) system which is governed by the above principle, we may add that the tonal center represents a single note (Tonic) from the melodic point of view, and a chord of three notes arranged by Thirds (tonic Triad) from the harmonic point of view. Again, that in the melodic aspect this system manifests a characteristic distribution of its seven regular (diatonic) degrees within an Octave, forming various chains of whole steps and half steps (Modes) which, by the aid of the additional set of five auxiliary (chromatic) degrees interpolated between the former, can be freely transposed into twelve different keys. Finally, that from the harmonic viewpoint this system divides all its possible tonal combinations into two distinctly opposed groups of consonances and dissonances, the latter inevitably "requiring" resolution into the former.

ATONALITY DEFINED

So much for Tonality. As regards Atonality it is easy to form a concept since, as the structure of the term shows, it appears to be simply a negation of Tonality, i.e. a negation of whatever this latter notion affirms. Thus, Atonality negates any principle of gravitation of the scale-tones toward some uniting "autocratic" center. It further negates the division

of all scale-tones into two different groups labeled diatonic and chromatic or, in a more general sense, regular and auxiliary groups of degrees, all of them becoming equally "regular" in their functions, thereby precluding, to be exact, the possible formation of any "Modes" and "Keys." Atonality likewise negates the division of all the harmonic combinations into consonances and dissonances, the latter also becoming some sort of "consonances," at least in the sense that, like the former, they no longer require resolution. In other words Atonality somehow disorganizes the musical system as a system, bringing it to a certain anarchic state.

The only thing that is completely preserved by Atonality in this general negating, is the actual tonal material of the previously used system (twelve tones within an octave in our instance), in which not even intonation is modified in the slightest degree. Moreover, as we shall see later, it is largely due to the equally-tempered (i.e. artificial) intonation of the negated system that Atonality could have been carried to such an extreme as outlined above. This leads us to the conclusion that Atonality, in its extreme form, inevitably possesses some artificial characteristics that would never have appeared under the condition of just (i. e. natural) intonation.

I have purposely described the principles of Tonality and Atonality in most sharply defined terms so as to bring out more clearly their inward opposition to each other. But it should be borne in mind that the one does not suddenly follow the other in the process of historical evolution. There are a number of intermediate phases. The seeds of

Atonality are inherent in Tonality and may easily be detected in many of its particular forms. Similarly the seeds of Supra-Tonality should be easily detected in Atonality which, historically, is followed by the former and synthesized jointly with Tonality.

SUPRA-TONALITY NO COMPROMISE

Formally representing a negative entity, Atonality possesses, none-the-less, certain constructive features; just as Tonality, formally representing a positive entity, may have certain negative characteristics. Supra-Tonality synthesizes only what is constructive in both Tonality and Atonality. But from this it should not be hastily and erroneously inferred that Supra-Tonality merely compromises Tonality and Atonality, that it is practically a sort of "happy medium" between them. Supra-Tonality is not to be found *between* Tonality and Atonality but *above* them; it does not *compromise* these two principles but *synthesizes* them, which is a different thing altogether. As a mere compromise Supra-Tonality would prove to be no more than "sand-papered" Atonality—which it is not. Thus Atonality, as already remarked, does not at all change the tonal medium of the old system (twelve tones within an octave) but only *its own attitude* toward that medium. Supra-Tonality creates a new and more complicated tonal medium which is technically modeled on the old and less complicated one.

It is easy to prove that in contradistinction to a compromise between Tonality and Atonality, their synthesis (i.e. the synthesis of their constructive elements, as already stated) calls for a complication of the old tonal medium. But first we

apparently have to determine what their "constructive" parts are.

CONSTRUCTIVE ELEMENTS

In Tonality, it is the "organization of the sound" and what is practically manifested in the existence of a "tonocentric" system with a variety of modes and keys, with a division of all the scale-tones into two different groups of regular and auxiliary degrees and of all the harmonic combinations into two polar groups of consonances and dissonances, their interaction creating a genuine "dynamism" in the musical work. All this is lacking in Atonality, whose only advantage over Tonality (and this is exactly what constitutes its constructive element) is that it increases the number of "regular" scale-degrees (twelve instead of seven) and the number of chords not requiring resolution. Their limitation in Tonality represents its negative part.

It becomes immediately evident that the synthesis of the "constructive" elements of Tonality and Atonality by Supra-Tonality inevitably predetermines a more complicated tonal medium, since the synthesized scale must contain two functionally different sets of degrees (regular and auxiliary) on the one hand, and on the other, an *increased* number of regular degrees (which naturally calls for a proportionate increase of auxiliary degrees). This scale is shown in explanatory keyboard form (Plate I) above the similar representation of our conventional diatonic scale (whose complete constitution, comprising both the regular and the auxiliary degrees, will henceforth be expressed by the formula "7 + 5") and apparently contains twelve regular and seven auxiliary

degrees (formula "12 + 7"). Its structural similarity to the diatonic scale and, at the same time, the increased number of its component tones within an octave (which, of course, makes its characteristic "whole steps" and "half steps" acoustically much smaller than those of the diatonic scale) allows us to attach to it the name of supra-diatonic scale.

HISTORICAL PROOF

In order to explain how the supra-diatonic scale, which represents the material embodiment of the principle of Supra-Tonality, is evolved in this particular manner, we must turn far back in history. First of all, proofs must be produced of the existence of some sort of scale which might be considered the parallel material embodiment of the principle of Infra-Tonality. As such, this scale must obviously bear the same relation to the diatonic scale as the supra-diatonic scale does, but in reverse order. In other words, it must be structurally similar to the diatonic scale, and, at the same time, proportionately *less* complicated in its general tonal constitution, just as the supra-diatonic scale, being structurally similar to the diatonic scale, is *more* complicated in its general tonal constitution. This less complicated or "infra-diatonic" scale must have two functionally different sets of degrees, regular and auxiliary. The former of these should be arranged in such a way as to form a characteristic chain of "whole steps and half steps," their acoustical dimension being, of course, much greater than what we are familiar with in the diatonic scale, since the general number of scale-tones within an octave is smaller in the former

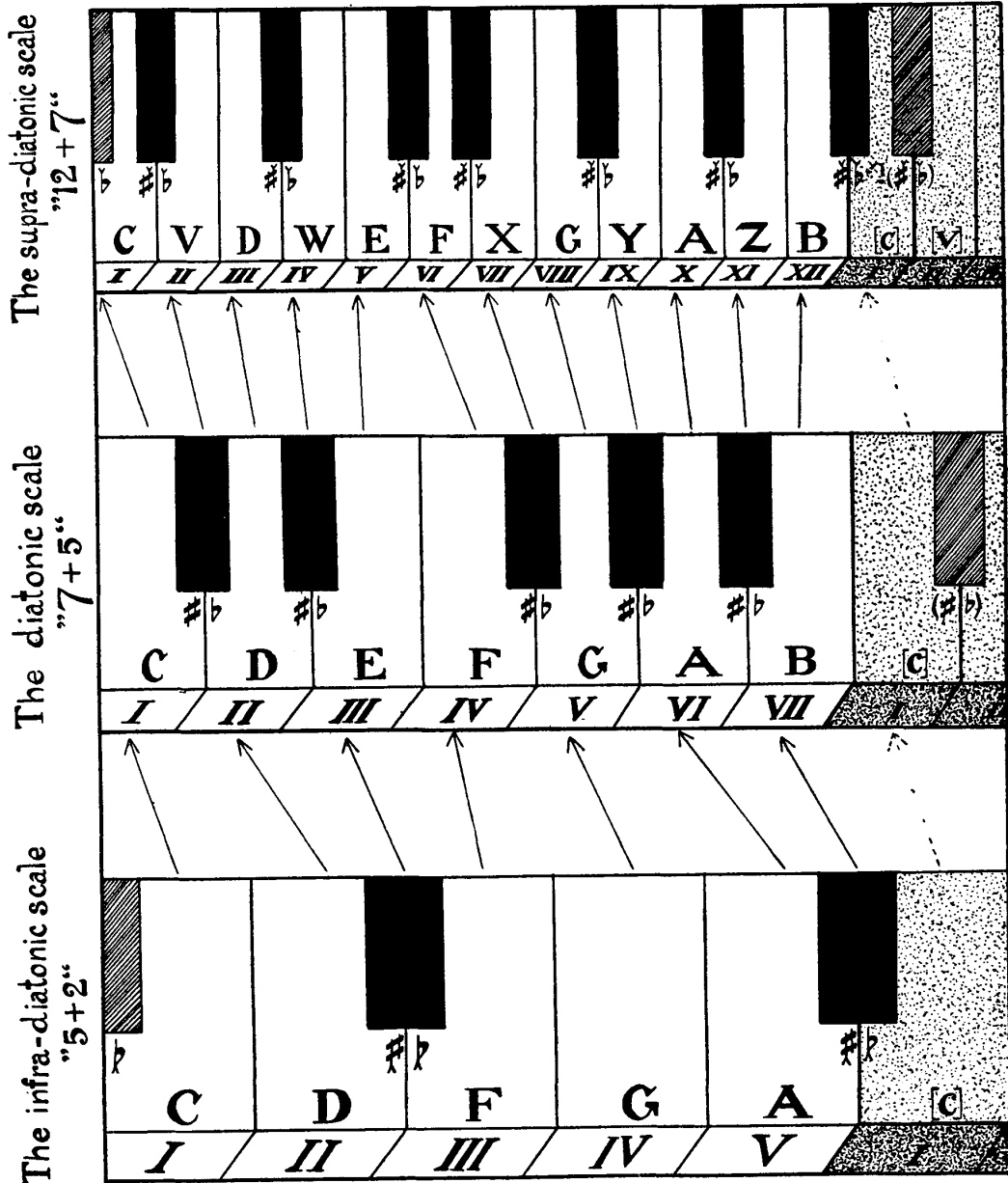


PLATE I

The shaded keys belong to the adjacent octaves. The last five letters of the alphabet, V, W, X, Y, Z are adopted for the increased number of the regular degrees of the supra-diatonic scale.

A small sign placed at the top of the sharp and flat transforms them into supra-sharp and supra-flat, and placed at the bottom transforms them into infra-sharp and infra-flat. These new alterations perform the same functions in their respective scales as the sharp and flat in the diatonic scale.

instance. It is precisely from the relation of the number and arrangement of the regular and auxiliary degrees of the infra-diatonic scale to the number and mutual arrangement of the regular and auxiliary degrees of the diatonic scale that the structure of the supra-diatonic scale must be evolved.

This historical method as applied to the evolution of a scale containing a greater number of tones within an octave and, consequently, more subtle intervals between them, in comparison with those of present musical practise, is the only one which leads to a *single* solution of the most pressing problem of our day. The writer emphatically opposes it to all other methods applied heretofore and especially to those very arbitrary ones which consist in a purely "mechanical" splitting of the existing equally-tempered semitones into quarter-tones or eighth-tones or even smaller fractions, obviously leading to as many solutions of the problem as there are "splittings" of the semitones, to which there is practically no limit. By heedlessly ignoring all the historical factors, the upholders of these methods forget a very simple thing, viz. that the splitting of a semitone, let us say, into quarter-tones, which results in the duplication of our present twelve tones into twenty-four within an octave, presupposes (if one is to be logical) the existence of a six-tone system prior to our twelve-tone system, and that of a three-tone system preceding the latter, thereby ineptly barring from musical evolution the heptatonic (diatonic) and pentatonic scales, practically the only ones bearing a stamp of *universality* that is scarcely disputed.

In dealing with the evolution of musical scales, universality is the main, if not the only consideration in seeking "live" scales that actually play a part in the historical process under investigation. We cannot afford to pay too much attention to a multitude of scales of purely "local" significance (however interesting and curious), which usually turn out to be "variations" (obvious or disguised) of one of the universal types of scales, akin to those variations through which a number of seemingly different phenomena are similarly explained in biological science.

"LIVE" SCALES

There is of course no doubt of the relative universality of the Western diatonic scale. Modern musical science also accepts the historic universality of the pentatonic scale which may be found in the past or present musical practise of almost every country. In Europe particularly, despite the difficulty of obtaining authentic information, the pentatonic scale is now known to have been used in Scandinavia, the British Isles (strongest evidences), Northern France (Brittany), Germany (Nithart's *Minnegesänge*), a good many parts of Russia (European and Asiatic), some parts of Finland, Rumania and possibly Spain (whose folksongs are considered by Riemann as an example of a *Zwischenstadie* between the pentatonic and the definite heptatonic scale). Even the old Gregorian chants are not devoid of pentatonic elements. Ancient Greece (one of their sources, besides Hebrew cantillations, which are also full of "pentatonisms") experienced at one time the practical use of the pentatonic scale (eighth century B. C.,

according to Plutarch), in spite of the parallel existence of heptatonic and other scales in her musical theory.

THE UNIVERSAL PENTATONIC

We may therefore surmise with a fair amount of safety: First, that the countries omitted in this list are but "missing links" in what was once a general use of the pentatonic scale in the musical practise of Europe (the use of this scale in non-European countries is too well-known to be mentioned here). Second, that only the pentatonic scale, if any, could serve as the possible embodiment of the principle of "Infra-Tonality," if we believe that the latter has ever had any existence at all. Let us therefore closely examine this scale and see whether it has some of the characteristics of the diatonic (even though on a "lower plane") and, if so, whether the development of the pentatonic into the diatonic scale could proceed historically along lines similar to those which we are all witnessing to-day in the development of the diatonic into the supra-diatonic scale, predicted above.

The most widely known form of the pentatonic scale, to which all its "variations" can be easily reduced, is the one usually expressed by the five notes C, D, F, G, A of our present musical system. Each of these notes may naturally serve as a Tonic of the pentatonic scale, thereby producing its various "modal" versions. As a matter of fact, these are found in the music of different countries where the pentatonic scale is or was used. The five notes represent the *complete* set of "regular" degrees of this scale. However, judging from the musical

practise of some nations, it also has a pair of "auxiliary" degrees interpolated between its regular ones, similar to the chromatic (auxiliary) degrees of our present system interpolated between its diatonic (regular) ones. The two auxiliary degrees of the pentatonic scale, which can be very closely expressed by the notes E and B of our diatonic (perfectly accurate under the condition of Pythagorean intonation of both scales), are rigidly distinguished from the five regular degrees, their functions being practically the same as those of the auxiliaries within the diatonic scale. Considering the striking structural similarity between the less complicated pentatonic scale (complete formula "5+2") on the one hand, and the comparatively more complicated diatonic scale (complete formula "7+5") on the other, I have found it advisable to attach the name *infra-diatonic scale* to the former. This is pictured in a manner similar to the latter, in the explanatory form of a keyboard with white and black keys representing its five regular and two auxiliary degrees respectively (Plate I).

To achieve simplicity all three keyboards of this illustration are drawn for the equally-tempered intonation of the infra-diatonic, diatonic and supra-diatonic scales which assumes that the Octave is divided into seven equal parts in the first instance ("5 + 2"), twelve equal parts in the second ("7+5"), and nineteen equal parts in the third ("12 + 7"). Without making any predictions as to the practicability of equally-tempered intonation for the supra-diatonic scale (which will be called *supra-tempered intonation*, for distinction), it is worth mentioning that the diatonic scale ("7 + 5") is not the

only one to which the principle of Equal Temperament has been applied. The same principle is used in the infra-diatonic scale ("5+2") of the Siamese who, through their *infra-tempered intonation*, acquired recently, as time goes in the Orient, now have the most powerful technical means for the exhaustive exploitation of the musical resources latent in this scale—a potential possibility that has never really been within the reach of any other nation without that intonation at hand.

EFFECTS OF TEMPERAMENT

We are all familiar with the magnificent results which were obtained in European music through the application of the principle of Equal Temperament to the diatonic scale ("7 + 5"). That is why we may safely approve the Siamese idea of tempering the infra-diatonic scale ("5+2") and encourage the idea of tempering in the future the supra-diatonic scale ("12+7"). But at the same time we must not close our eyes to a considerable drawback in the principle of Equal Temperament, of which few people are fully aware. It resides *not*, as some will probably think, in the much discussed discrepancy between the equally tempered and just intonation of one and the same scale—a difference which, as repeatedly proved, is perfectly negligible from a practical point of view. The drawback is much more serious and will be better understood in connection with the following explanation of the method by which the supra-diatonic scale is evolved.

Even a superficial glance at the keyboard-illustration (Plate I) in which our newly conceived pentatonic (infra-diatonic) scale plays a basic part, at once conveys the idea of the his-

toric evolution of each "regular" set of degrees of the two subsequent scales. Indeed, it is more than natural to assume that the pair of auxiliary degrees of the infra-diatonic scale, represented therein by two black keys and originally mere "embellishments" of the five regular degrees, gradually came to be used on a par with the latter and with them eventually formed the set of seven regular degrees of the diatonic scale (this process is indicated by arrows). The diatonic scale, as known, was long used without any auxiliary degrees. Considerably later they formed a separate group of five notes, until recently rigidly distinguished in their functions from the group of seven regular degrees. Now we see the strongest tendency, on the part of some composers to use the five auxiliary degrees of this scale on a par with its seven regular degrees, jointly forming the *number* (twelve) of the regular degrees of the supra-diatonic scale. This fact inspires the conviction that certain modern composers dimly anticipate the structure of the supra-diatonic scale in spite of the fact that the characteristic *arrangement* of its twelve regular degrees "by whole steps and half steps" differs greatly from the characterless arrangement of the twelve-degree set of equal intervals "independently" used by these composers under the name of the duodecuple (practically our chromatic) scale.

A FORCED ARRANGEMENT

In order to understand the reason for the disparity between these two scales, which apparently were without precedent when the gradual transformation of the infra-diatonic into the diatonic scale took place, we

must plainly realize that the arrangement of the twelve degrees of equal intervals was not the result of a free choice on the part of modern composers but was *forced* upon them by the existing musical instruments with fixed, equally-tempered intonation or by the habits acquired through their general use. The unknown composers of the past would have faced the same experience if they had at their disposal musical instruments with fixed infra-tempered intonation, while inwardly anticipating the structure of the diatonic scale. Would they not have been forced to work with seven "independent" degrees arranged by equal intervals instead of the seven regular degrees of the diatonic scale arranged by characteristic whole steps and half steps? And would they not have tried in vain to express, by the aid of these equal intervals, diatonic melodies which can never be recognized by the ear unless they are based on the familiar distribution of whole steps and half steps—just as our modern composers are vainly trying to squeeze into the twelve equal intervals of the duodecuple scale the supra-diatonic melodies unconsciously created by them?

In the light of this disparity between the scale which, we assume, is inwardly heard by the composers of to-day, and the scale they are compelled to use for technical reasons, the destructive side of Equal Temperament becomes most conspicuous. The happy invention to which we are indebted for the splendid musical development of the last few centuries and even for the very existence of the greatest musical works, becomes something little short of a calamity when the tonal foundation

of music in itself shows certain tendencies towards growth. This is being artificially halted by the old and threadbare, equally-tempered intonation or is misdirected by those who believe that the existing equally tempered scale will give rise to a somewhat renovated if not entirely new intonation, when duplicated a quarter tone higher or lower. It is like believing that two old, worn-out garments placed side by side will create the impression of a new one.

THE AUXILIARY DEGREES

The destructive side of Equal Temperament, demonstrated above from the melodic aspect of the scale, manifests itself still more obviously from the harmonic point of view. But since this is connected with the arrangement (and not merely the number) of the regular degrees of the scales discussed, which in turn depends on the distribution of their respective auxiliary degrees, the law of their evolution becomes the next point to be demonstrated. This law is just as simple as the one, already explained, which concerns the evolution of the regular degrees of these scales, and is visually expressed in the other keyboard-illustration, Plate II, in which our three keyboards are again represented but in reverse order; thus the one referring to the infra-diatonic scale is placed at the top instead of the bottom, and so on. (See page 11.)

Every musician undoubtedly knows from experience that any "pentatonic" tune—Chinese, Scotch, etc.—may be easily performed on the five black keys of our pianoforte without touching the white keys at all. This is due to the fact that the number and arrangement of the regular degrees of the infra-diatonic scale are

identical with the number and arrangement of the auxiliary degrees of the diatonic scale, as indicated by the arrows in the illustration (the difference in pitch and intonation is of no concern here, since each of these two factors can always be identified in both scales, if desired). It is then perfectly apparent that in order to establish a similar relationship between the respective sets of degrees of the diatonic and supra-diatonic scales it is necessary to distribute the latter's auxiliary degrees in such a manner that any diatonic tune may easily be performed on the seven black keys of the new keyboard, without touching its twelve white keys at all. This is exactly what we have done with the supra-diatonic scale ("12+7"), the rather complicated mathematical procedure involved being omitted here for simplicity. Owing to this principle, (demonstrated by the two keyboard-illustrations), it now bears the very same relation to the diatonic scale ("7+5") as the latter does to the infra-diatonic scale ("5+2").

HARMONIC EVOLUTION

With the structure and interrelation of all three scales clearly explained, let us now see how the new principle of evolution works out in the field of harmony and how it explains the most outstanding tendencies of chord-formation in the three respective stages of musical development. Three genuine methods of chord-formation are known which it is fairly safe to accept as characteristic and which may be roughly outlined as follows:

First Stage. The Infra-diatonic Scale ("5+2"):

Principally, harmonic combinations of perfect Fourths and

their progressions, especially prevalent in Far-Eastern countries and among peoples of Celtic origin. The Celts introduced this method to Europe where it endured for a long time, partly because of dogmatic reasons (theoretical conformity with Greek authorities) and partly for musico-psychological ones (discussed later). Thus it was erroneously applied to music based mostly on the diatonic scale ("diaphonized" Gregorian chants). Feeble attempts to form more complicated chords "by Fourths" (Chinese).

Intermediate Stage: Gradually increasing use of Thirds and other intervals.

Second Stage: The Diatonic Scale ("7+5"):

Familiar construction of chords "by Thirds."

Intermediate Stage: Gradually increasing use of chromatically altered chords.

Third Stage. The Supra-Diatonic Scale ("12+7"):

Formation of chords by various intervals which, however, could be reduced to a whole-step harmonic combination (inaccurately termed "whole-tone *scale*"), when brought within the compass of an octave. Further harmonic development connected with this stage will be touched upon later.

FORMATION "BY THIRDS"

These three methods of chord-formation taken separately and outside of their connection with the three tonal systems seem different and even contradistinctive. But glance at the three keyboards repre-

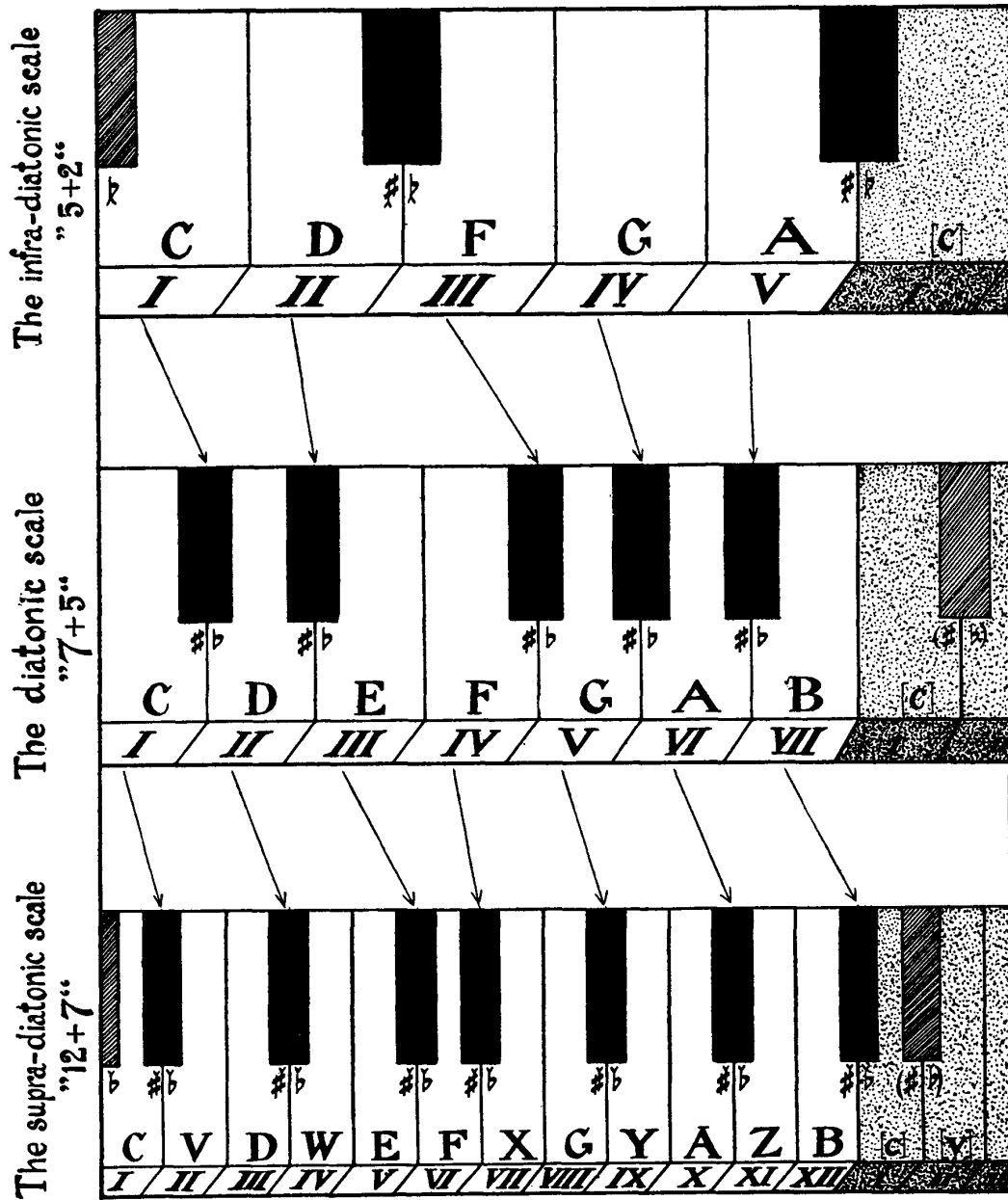


PLATE II

(See explanatory note under Plate I)

sented above and you will soon observe that these three methods, unexpected as it may seem, are subject to the same principle of chord-formation "by Thirds," provided that the interval of a "Third" is everywhere (and not only in the diatonic scale) understood in its direct "numerical" sense, whatever its actual acoustic dimension may be, i.e., concretely speaking, as an interval between the first and the third regular degree or, which comes to the same thing, between the second and the fourth regular degrees, etc. of any scale. From this point of view, intervals like C-F or D-G, for instance, which play the principal part in the harmonic formations of music based on the infra-diatonic scale (first "stage") are *not* "Fourths" in it any more, but "Thirds," since the note F is the third and not the fourth regular in relation to note C of this scale, and so is note G in relation to D. The same is true of intervals such as C-D or D-E, which play the principal part in harmonic formations of music based (presumably) on the supra-diatonic scale (third "stage") and which are *not* "Seconds" or "whole steps" in it any more, but "Thirds," since note D is the third and not the second regular degree in relation to note C of this scale, and so is note E in relation to D. All of which apparently leads to a quite elastic "relative" meaning of the term "Third" (as well as of the other numerical designations of intervals), when considered in different scales, and makes it practical to name it, for distinction, "infra-Third" and "supra-Third," when referring to the infra-diatonic and supra-diatonic scales respectively.

The essential point of this discussion, of course, lies in the fact that

the formal method of harmonic construction is the same in every one of our three principal "stages" of musical development. The chords are formed "by infra-Thirds" in the first instance, "by Thirds" in the second, and "by supra-Thirds" in the last—a fact which brings additional proof of similarity between the three scales in question. A still more important consequence follows from this generalized method of chord-formation which deserves special attention. It concerns the harmonic combinations of the supra-diatonic scale which, being formed "by supra-Thirds" (C-D-E-X-Y-Z, for instance), are considered as based on the whole-step chord (C-D-E-F#-G#-A#) from the standpoint of the diatonic scale. Now glance again at the first of our two keyboard-illustrations (Plate I) and you will see that the very same interrelation exists between the diatonic and infra-diatonic scales. Any chord constructed "by Thirds" in the former of these two scales (C-E-G, for instance) could not be regarded otherwise than as based on the "whole-step chord" (C-D infra-sharp-G) from the standpoint of the latter.

THE EVILS OF NEUTRALITY

Now here is another point where the drawback of Equal Temperament manifests itself sharply. If we consider the infra-diatonic scale in the equally-tempered form, when comparing its "whole-step chord" with the diatonic chord constructed "by Thirds," we shall at once discover that the combination C-D infra-sharp-G does not adequately represent the combination C-E-G, since the two whole steps of the former harmonic combination (C-D infra-

sharp, and D infra-sharp-G) are equal to each other, under the condition of Equal Temperament, jointly forming the so-called "neutral Triad," while the two Thirds (C-E and E-G) of the latter harmonic combination always remain of different dimensions, irrespective of the intonation of the diatonic scale. It is precisely the same relation that exists between the whole-step chord C-D-E-F#-G#-A# and the chord of six notes (Hexad) constructed by supra-Thirds C-D-E-X-Y-Z, of which the former does not adequately represent the latter in the equally-tempered intonation of the scale "7+5." This is because all the whole steps, being tempered, become absolutely equal to each other, while among the series of supra-infra-Thirds there is one (E-X) which is apparently larger than all the rest. In this way the whole-step combination of six notes of the scale "7+5" represents a "neutral Hexad" to the same extent as the whole-step combination of three notes of the scale "5+2" represents a neutral Triad. Now imagine a composer who inwardly creates plain "diatonic" music and at the same time has at his command "infra-tempered" musical instruments for its reproduction (i.e. instruments with seven equidistant tones within an octave instead of the characteristic "modal" distribution of the same number of tones, and with the possibility of forming only "neutral" Triads instead of diatonic major and minor Triads). By analogy you will realize fairly well the problem of our modern composer who inwardly creates "supra-diatonic" music and, at the same time, is compelled to use the present tempered system and instruments for its notation and re-

production.

Needless to say, no harmonic complication of any sort to which our modern composers have turned after the "neutrality" of the whole-step chord revealed its musical paucity, will ever conceal the basic disparity between the scale in which they create and the scale in which their music is misrepresented. And, of course, it is the resulting impossibility on the part of the modern composer to express himself adequately and in comparatively simple terms in the new "supra-diatonic" language and to create at least a rudimentary musical grammar for it under existing conditions, which drives him to hypertrophic and groundless harmonic complication and to the proclamation of Atonality, in its most acute form, already long outgrown by him. Thus artificial, equally tempered intonation, former ally of the composer, has now turned against him, and bars the entrance to the realm of Supra-Tonality, holding his creative development at a standstill.

Inasmuch as the "atonal" period in European music appears to be an integral part of a natural historic process, it would certainly have occurred without the existence of Equal Temperament. But then it would never have acquired such an extreme form and would probably have passed into the "supra-tonal" period without any particular commotion. Such was the case with the "infra-atonal" period in European music which, generally speaking, passed into the "tonal" period (diatonic scale) so gradually that its very existence or, at all events, its proper nature, was not fully realized until the present. Now we face the difficult task of proving the histori-

cal existence of Infra-Atonality in order to support our "dialectic" construction, of which it is apparently one of the fundamental pillars.

INFRA-ATONALITY

It must be admitted that conditions for the demonstration are far from favorable. The scarcity of genuine material about the period in question, and the comparative primitiveness and insignificance (from our present standpoint) of the possible "revolts" and "anarchic" tendencies supposedly characteristic of the "infra-atonal" music of the remote past are the chief handicaps. Furthermore, the distinctive characteristics of Infra-Atonality will undoubtedly appear somewhat dulled, because Equal Temperament has never been applied to the infra-diatonic scale in the Western world. For these reasons, the utmost concentration will be required of the reader in following the brief analysis of Infra-Atonality and its period in European music, which we shall now give.

Infra-Atonality is the negation of Infra-Tonality—so much is clear. Regarding the latter principle we know so far only that it is embodied in the infra-diatonic scale ("5+2") which, like the diatonic scale, contains two functionally different groups of degrees (regular and auxiliary). From the melodic aspect the tonal center of this scale is, of course, represented by a single note (Tonic), identical with the tonal center of the diatonic scale. But these two outwardly identical tonal centers imply two entirely different constructions from the harmonic aspect of their respective scales. The tonal center of the diatonic scale is harmonically represented

by a *Triad*, i.e. a chord of three notes arranged "by Thirds." The tonal center of the infra-diatonic scale must naturally be represented by a less complicated chord which, considering its subordination to the principle of construction "by infra-Thirds," can be expressed only by a *Dyad*, i.e. a chord of two notes, an infra-Third apart, like C-F or D-G, etc.—a fact which immediately explains the abundance of Fourths (infra-Thirds) in primitive "infra-diatonic" harmonizations. These infra-Thirds are already *completed consonant chords* from the standpoint of the infra-diatonic scale and, under the condition of two-part harmony, permit hardly anything but parallel progressions. The only infra-Third (F-A) which is qualitatively smaller than the rest must be regarded as a "diminished Dyad" in the infra-diatonic scale and consequently as a discord, similar to the diminished Triad in the diatonic scale. This point of view fully accounts for the fact, so long a puzzle, that a major Third was deemed a dissonance in medieval Europe. Besides being a "diminished Dyad" in the infra-diatonic scale, not completely abandoned at that period, it is dimensionally equal to a whole step (from the standpoint of this scale) which, like a whole step of the diatonic scale, could not be considered a consonance.

STAGES OF REVOLT

The initial flashes of "revolt" against infra-Tonality (beginning of the "infra-atonal" period) naturally touched first the melodic aspect of the infra-diatonic scale in which the functional distinction between its two groups of regular and auxiliary degrees ("5+2") gradually disap-

peared. But the abolition of this distinction did not instantly transform the infra-diatonic scale into the diatonic scale, in the full sense of the word, as may seem at first sight. The musical psychology of medieval Europe remained for a long time "infra-tonal" in spite of the disappearance of this distinction, which is proved by the habits of harmonic thinking of the composers of that period who, until the end of the twelfth century, continued to look upon the interval of a Third as a dissonance. The Pythagorean intonation, then in use, which is the "just" intonation of the infra-diatonic scale, may serve as additional proof of this statement.

The further progress of Infra-Tonality already involves the harmonic aspect of the infra-diatonic scale and here, for almost two centuries, we find musical art fighting its way through an intermediate "anarchic" stage which (taking into account the non-existence of infra-tempered intonation at that time) it may not be too far-fetched to compare to our present musical period with its manifold methods of composition all of them ready for a certain new and dimly anticipated homogeneous language. The first step taken by medieval composers in the "negation" of the old harmonic principles concerned the interval of a Third (both major and minor) which gradually ceased to be a dissonance. It was formally proclaimed an "imperfect" consonance by Franco of Cologne who, however, did not find it possible (as might naturally be expected) to adopt the same attitude towards the interval of a Sixth, which represents simply an inversion of the former and, therefore, is harmonically identical with

it from the musical (though not the acoustical) point of view. This fact rather unambiguously suggests to us that the harmonic thought of that time, while "negating" what was characteristic of *Infra-Tonality*, had no definite "feeling" yet for what is characteristic of *Tonality* as embodied in the diatonic scale.

PRACTISE IN FAUXBOURDON

In Fauxbourdon we already come across the application of the Sixth on a par with the Third. Both being used in harmonic combination yielded practically all the elements found in the diatonic Triad. But the Triad when brought to its root position represents a whole-step chord from the standpoint of the infra-diatonic scale, as has been already demonstrated. With this in mind one cannot help finding in the practise of Fauxbourdon an obvious similarity with the initial steps of "negation" of our diatonic system by modern composers, also manifested in the use of harmonic formations reducible to a whole-step chord from the standpoint of the diatonic scale. And as the latter whole-step chord did not appear suddenly in our modern music but was historically preceded by the use of less complicated chords which already contained certain of its elements (the chords of the Ninth, for instance, when inverted), similarly the former whole-step chord was historically prepared by still more primitive harmonic combinations (progression of Thirds in the *Gymel* and prior to that, though but occasionally, in the so-called "irregular" *Organum*), which practically constituted its integral elements.

The Fauxbourdon, which (in its strict form) represents a series of inverted Triads ensuing from and

returning to a fundamental Triad with the Third omitted, seems to be so close to rudimentary chord-formation and, loosely speaking, even to chord-progression as prescribed by regular diatonic harmony, that one might naturally expect the latter immediately to follow the former in the process of historical evolution. But this was not the case. It is true that the composers who availed themselves of the principle of Fauxbourdon definitely departed from the principle of Infra-Tonality (particularly "negating" its tonal center, as expressed by the interval of a Fourth) but they apparently were still very far in their harmonic contemplation from the Tonality of the diatonic scale. This is proved by the fact that, from the time Fauxbourdon was in use, it took about a whole century (the thirteenth) before the correct division of consonances and dissonances, as well as the rudimentary rules of part-progression relating to "diatonic" Tonality were outlined by Philippe de Vitry. That luminous exponent of "Ars Nova," after strenuous efforts made by his predecessors and, no doubt, by himself too, finally discovered the right track to further harmonic development.

SIGNS OF TRANSITION

As to the character and the most diverse forms of these efforts, they are so typical of a transitional stage and so closely resemble the efforts of our own contemporary composers that, in view of our "dialectic" construction, the formal similarity of these two widely separated historical periods (Atonality and Infra-Atonality) is hardly open to doubt. Indeed, on investigating the history of the medieval *descant*, we find a

multitude of polyphonic methods tentatively established by different composers. The moderately inclined groups were earnestly seeking new, more or less definite rules of simultaneous combination of parts; while the "radicals," deriving their ideas from the old art of improvisation by a descanting voice around a given *tenor*, gradually took more liberties in handling the different and quantitatively increased parts. Eventually they discarded the necessity of any rules for the intervals, however dissonant, to be employed between them. The sole exception was at the beginning and end of each line of the composition for which some consonant harmony (often just a plain unison) was required.

From the harsh sonorities of this "infra-dissonant counterpoint" the attention of the listener was supposed to be diverted by the decided motion and rhythmical variety of the combined parts for which, preferably, popular tunes served as the principal musical material. The tunes selected, differing widely from every angle, including their French texts intentionally left untouched, were forcibly compressed within the official triple time-division of the tenor part, composed of short and constantly reiterated phrases of a certain plainsong which preserved its original Latin. Thus there arose a curious combination not only of different texts but also of different languages, producing what must have been a rather colorful "verbal orchestration"—a device which even our sophisticated modernists seem to have overlooked so far. The metrical conformity to which the combined melodies were artificially forced could certainly not change their intrinsic and often dissimilar rhythms

(in the broad sense of the word); therefore it would not be too daring to conjecture that these "radical" *motets* of 700 years ago contained, above all, a good many outwardly disguised elements of *polyrhythm*.

As to the general tonal basis of these compositions it perhaps did not venture, as a rule, beyond the conventional series (or its equivalent) of the heptatonic scale C-D-E-F-G-A-B which, at the period referred to, undoubtedly also served as material for the melodies themselves, subjected to simultaneous combination. Long before that, naturally, far less complicated (probably "pentatonic") and more homogeneous (at one time identical) melodies used to be combined in a similar "improvising" manner. In this connection there seem to be valid reasons to believe that the well-known statement of Gerald de Bari (twelfth century) concerning the polyphonic singing of the Welsh choruses in which "one may sometimes hear as many parts as there are performers," points to one of the earliest attempts to combine different melodic lines based on the infra-diatonic scale, then still in use. But even if, with Riemann, we make the safest supposition, namely, that all these choral parts were confined to the very same series of notes of the infra-diatonic scale (of which, however, there are no indications in Gerald's statement) it would of course be quite logical to conjecture further that there existed a few intermediate links between these two forms of polyphonic improvisation (since history knows no sudden leaps) and, consequently, that the combined parts were sometimes based on slightly different series of five notes, all of them, however, remaining within the limits

of the seven diatonic degrees.

Thus, supposing one of the parts to be based on the series C-D-F-G-A, while the other part was based on the series G-A-C-D-E, from the standpoint of the diatonic scale there would be nothing unusual in their combination, certainly less complicated than the combination of two or more parts based on the series of seven notes each, as practised by the "radicals" in the immeasurably more developed form of descant described above. But from the standpoint of the infra-diatonic scale, the combination of these two five-tone series, which unquestionably must have appeared prior to that "radical" form of descant, appears as something altogether different and rather out of the ordinary. This is because the note E found in the second of these series (G-A-C-D-E) does not exist in the regular degrees of the infra-diatonic scale, and in fact is merely a designation borrowed from the diatonic scale, equivalent to one of the auxiliary degrees (F infra-flat) of the former. Therefore the two five-tone series above, which belong to one key from the standpoint of the diatonic scale, represent in reality two different keys of the infra-diatonic scale, one of which has no infra-chromatic alterations at all (C-D-F-G-A), while the other, built a Fifth above, contains one such alteration (G-A-C-D-F infra-flat). And if we suppose that there existed, in medieval musical practise, a three-part vocal improvisation based on the infra-diatonic scale, the third part comprising no other notes than D-E-G-A-B (which is not at all improbable since this series still belongs to one and the same key from the standpoint of the diatonic scale), then we would have three

keys of the infra-diatonic scale combined together, the last indicated series containing, in reality, two infra-chromatic alterations (D-F infra-flat-G-A-C infra-flat).

INFRA-POLYTONALITY

It seems needless to add that the combination of different keys of the infra-diatonic scale, by which the predominance of a single infra-tonal center is negated, evidently represents an application (though unconscious, as everything else with medieval composers) of the principle of "Infra-Polytonality", as we may appropriately term it. But through the multiplicity of infra-tonal centers, Infra-Polytonality imperceptibly strives at the same time to affirm a single tonal (diatonic) center, since the above combination of keys of the infra-diatonic scale, as we have seen, is easily disposed within the limits of a single key of the diatonic scale. Therefore, Infra-Polytonality, apparently representing one of the intermediate phases between Infra-Tonality and diatonic Tonality, should be regarded simply as a particular form of Infra-Atonality which, in general, not only negates the principle of Infra-Tonality but also manifests a definite tendency towards diatonic Tonality in the process of evolution.

The various forms of descant practiced during the medieval "infra-atonal" period could of course be more specifically analyzed and parallel comparisons made with the individual creative output of the present "atonal" period which, according to our basic premise, is merely repeating (in principle) the former, though on a "higher plane." Being limited for space, however, I shall demonstrate but a single

instance of this kind in order to dispel any doubts regarding the possibility of such an historic parallelism.

I have selected for this purpose a rather peculiar form of descant, briefly described by Simon Tunsted (fourteenth century), in which the cantus firmus, doubled (occasionally with embellishments) by two or three voices at the Fifth, Eighth and Twelfth, evidently produced a primitive and typical infra-diatonic harmony, the interval of a Fourth (between the Fifth and the Eighth) probably serving as the nucleus of a Diaphony. At the same time an experienced descanter, while leading his own part against these rigid progressions, intentionally avoids the concords (from the standpoint of that harmony) in order to deceive the ear and to convey the impression that all the rest of the singers, who constitute the principal body of the ensemble, are also descanting and not merely performing their regular task. The work which, in our modern times, follows the same principle on a "higher plane" is Stravinsky's *Les Noces*. The principal choral body of this composition is garbed—as a rule—in primitive diatonic harmonies, while the pianoforte ensemble (the instrumental "descanter" in this case, only with all the notes written down) intentionally avoids the concords and certainly deceives the ear, which receives the impression that the vocalists are also carrying out their parts according to non-diatonic formulas.

There is reason to believe that the form of descant referred to, although quoted from a fourteenth century treatise (regarded now as a compilation rather than as an

original work), was already in practical use as early as the beginning of the twelfth century and perhaps was one of those which then evoked the characteristic criticism of John Cotton with his well-known comparison of the descanters to far-gone drunkards who after long wandering do indeed reach home but can never explain later, even to themselves, how and by what route they managed to do so. Similar criticisms were doubtless made throughout the entire period of descant and perhaps even grew in severity as may be judged from the much later attacks by Johannes de Muris, a writer of the fourteenth century. This famous theorist accused the descanters of his day of not knowing and not wanting to apply any musical rules—hence of being unable to distinguish good harmonic combinations from bad, thereby inflicting atrocious torture upon the ears of their listeners.

“JUST A LUCKY ACCIDENT”

“What a rudeness,” he said, “what a brutality not to distinguish an ass from a man, a goat from a lion, a sheep from a fish; the descanters sing without any knowledge of harmony, their voices totter around the *tenor* without any system and if they sometimes produce a concord it is just a lucky accident, similar to that of a stone which hits the target about once in a hundred times, when flung at random by an unskilled hand.”

It is noteworthy that in spite of living at a time when the application of the “tonal” principles of the “Ars Nova” was already in full swing, the author of the above quotation still adhered *psychologically* to the old “infra-tonal” conceptions, in that

he considered the Octave, the Fifth and the Fourth as having a *nobler* effect on the human mind than the Third and Sixth (he once even spoke of a minor Sixth as still being a dissonance), not to mention the rest of the intervals. On the other hand the same “Ars Nova” which, from all evidence, had not yet succeeded in thoroughly eradicating conservative “infra-tonal” propensities, could not at one stroke put an end to the radical art of the descanters which progressed by the power of historic inertia as far as the middle of the sixteenth century, under the name of *Contrapunto alla mente* and, moreover, was even practiced on holy days in the Papal chapel, notwithstanding its prohibition by the notorious bull of Pope John XXII in 1324. Which shows how gradual was the entire evolutionary process beginning with the first symptoms of rebellious Infra-Atonality and ending with the definitive establishment of diatonic Tonality.

TEMPERING INFRA-TONALITY

Musical development would have been quite different, however, had the principle of Equal Temperament been applied to the infra-diatonic scale (“5+2”) in early medieval music, just as it is now being applied by the Siamese. It is not difficult at all to guess, in the first place, that the European music which was based on the infra-diatonic scale would then have reached a much higher level because the infra-tempered intonation (Octave divided into seven equal intervals) would immediately release the great and extraordinarily productive potentialities of modulation (including the possibility of construction of a complete and closed system of harmony) which, as we

know from experience with our own diatonic scale ("7+5"), cannot be effected in all its manifold aspects under the condition of just intonation. We may safely take it for granted that Infra-Tonality would have been well-nigh exhausted before showing even the slightest tendency towards negation, i.e. Infra-Atonality. But when the time came for the latter principle, we may be sure that it would soon have eclipsed in acuteness, the most daring harmonies and polyphonic experiments of the "radical" descanters, described above. Indeed, even beginning with the first few feeble "revolts" in connection with the melodic aspect of the old infra-diatonic system, Infra-Atonality, when armed with Equal Temperament, would have brought forth something entirely different from what actually took place in the history of medieval music. The two auxiliary degrees of the infra-diatonic scale used on a par with its five regular degrees would in no wise yield to the composer the tonal material of the diatonic scale, but merely a series of seven equidistant tones within an octave, upon which none of the newly composed tunes, based on seven "regular" degrees, could be adequately performed. This circumstance would naturally have turned composers (sooner than was actually the case) to the exploitation of the harmonic aspect of the new scale which, however, would not have justified their expectations, as we shall now see.

STEPS TOWARD "ARS NOVA"

Let us suppose that these medieval composers would first come to the use of the Gymel and the Fauxbourdon—a natural inference since the harmonic combinations involved

in these two principles are Thirds (original or inverted) from the standpoint of the diatonic scale, and whole steps from the standpoint of the old infra-diatonic scale. In the actual march of events these harmonic combinations, as we know, gave composers a fairly approximate idea of what the real diatonic harmonies they were seeking sounded like. This, in turn, led some of them to the difficult task of delving more deeply into the matter, notwithstanding the gradually increasing vagaries of their impatient "radical" brethren which in the long run resulted in the firm establishment of the principles of the "Ars Nova" and further in a development of polyphonic art unparalleled in the history of music.

But all these results could never materialize with the Octave divided into seven equal intervals as required by infra-tempered intonation. In the first place the "Thirds" of the Gymel and Fauxbourdon would automatically be "neutralized" by this intonation, since the whole steps of the infra-diatonic scale, by the use of which these Thirds are produced, would themselves be rigidly equalized. In other words, composers could not then obtain a series of major and minor Thirds (Gymel) or a series of major and minor inverted Triads (Fauxbourdon) but merely a sort of *neutral* Thirds and *neutral* inverted Triads acoustically occupying some middle position between the former. These neutral intervals and chords would certainly convey to the composers a very poor idea, if any, of the characteristic diatonic intervals and chords, which they dimly anticipated at that time, and would most probably have altogether perverted their dawning

conceptions of consonance and dissonance, so closely connected with that anticipation. At all events we may be perfectly sure that no composer or theorist, not even a dozen Philippe de Vitrys, could ever have evolved the principles of the "Ars Nova" if he had at his command seven equal intervals within an octave instead of the characteristic series of whole steps and half steps of the diatonic scale, and "neutral" Thirds, Sixths, Seconds and Sevenths instead of these intervals properly and characteristically distinguished, in each instance, as "major" and "minor."

HYPOTHETICAL PROGRESS

This state of affairs would most certainly have given the upper hand, perhaps even complete hegemony, to the radical group of composers who, no longer finding any resistance in their path, would have accelerated the otherwise slow historical process, very soon coming to the "free" use of complicated harmonic combinations, simultaneously involving the seven equidistant tones of their scale. They would have been driven inevitably to this harmonic complication by the inadequate intonation of "neutral" intervals which, however, would soon follow them like a shadow in all their experiments until they reached the above limit. This would have been the *non plus ultra* of Infra-Atonality, with utter negation of all former principles but without the establishment of any new ones, and in particular, acute negation of the infra-tonal as well as of the tonal center, which is to be expected since the latter "center" could be represented in their system only by the caricature of a "neutral" Triad. And after that? It is immediately evident that the only, and rather

empty possibility left to these medieval radicals would be to treat the scale-tones *not* as members of a certain system but simply as a group of disconnected units serving for the production of new sonorities as sonorities which, when combined with variety of rhythm and timbre, would probably give rise to some amusing and, at times, even clever inventions. But all these potentialities could hardly satisfy a composer craving for something deeper, a man convinced that he had within him a message to give to the world. Imagine a Palestrina or a Beethoven compelled to such musical externalism or, at best, to a choice between that and the most outrageous misrepresentation of his ideas by the "infra-tonal" medium with its seven equidistant tones and "neutral" harmonic formations. The position of such composers would certainly be little short of tragic. One can also understand that no mechanical increase of the number of tones within an octave (which would give, for instance, fourteen tones instead of seven in the case of duplication) could save the situation. It would, if anything, lead to still greater confusion.

DISTEMPERING THE SCALE

Not a single composer or theorist of our day will doubt that under such conditions, the only way to remove the "infra-tonal" music of medieval composers from the impasse to which infra-tempered intonation, long outgrown, would lead them, would be to distemper their seven-tone scale and then to re-temper it jointly with the five auxiliary (chromatically altered) tones after the latter should gradually appear in the process of evolution. This

operation would call for a division of the octave into twelve equal intervals (instead of seven, as heretofore) which, as we know at present, does not perceptibly effect the characteristic qualities of the diatonic scale and of its harmonic structures, and at the same time places at the disposal of the composer all the marvelous advantages already mentioned. However, this new division of an Octave (tempered intonation) is only *relatively* better than the old one and by no means represents a final form for all future musical systems to come. It is good only for the diatonic scale which brought it to life and it becomes obsolete as soon as this scale shows definite signs of wear. Moreover, it then constitutes a dangerous obstacle to musical creation, similar to the old division of an Octave (infra-tempered intonation), when outgrown, and the only way to evade this periodically recurrent evil is to break it up inexorably and then to substitute for it a still more subtle division of the Octave (supra-tempered intonation) corresponding to the general number of tones the new scale comprises.

The modern composer who, we assume, could easily solve the above problem for the medieval composer (supposedly enchained by infra-tempered intonation) must fully realize that he himself is now facing an identical problem, although on a "higher plane." There is no need to repeat, or to dwell on the consecutive phases through which the modern composer (himself actually enchained by tempered intonation) has passed during the present "atonal" period, since they are similar and parallel to those of the "infra-atonal" period already described. It

is only worth while to point out one interesting and significant phase which occurred in the evolution of modern music immediately after the whole-step harmonic constructions of Debussy and his followers were widely used.

I have said that a complete whole-step chord which consists of six notes arranged at *equal* intervals represents but an inadequate reflection of the supra-diatonic Hexad, since one of the latter's component intervals (E-X) is *larger* than all the rest. This disparity between the supra-diatonic Hexad and the whole-step chord (which obviously is a "neutral" Hexad in relation to the former) could not, of course, be avoided under the conditions of our present twelve-tone tempered system. Now the reader may claim and justly so, that this disparity would not have passed absolutely unnoticed by the modern composer if our construction and prediction of the supra-diatonic scale were correct. He should already have made some effort to remedy this fault, however short he might fall of success.

SCRIABIN'S CHORD

It is, then, extremely significant to point out that an effort of this kind was actually made by Scriabin, who at the time could not have had the slightest idea of the construction of the supra-diatonic scale and its basic Hexad. Guided by intuition only, he did the most that could be done under the given conditions. In fact he *enlarged* one of the six equal whole steps of the "neutral Hexad" by transforming it into a sesqui-step (F#-A instead of F#-G#) and thus obtained a chord which could be expressed by the notes C-D-E-F#-A-Bb (when brought within an oc-

tave) approximating in structure the supra-diatonic Hexad Z-C-D-E-X-Y as well as F-G-A-B-V-W. Later (in *Prometheus*, for instance) he applied the same method to another whole step, transforming it from Ab-Bb into Ab-B and thereby obtaining a chord C-D-E-F#-Ab-B (when transposed to the key of C.) This shows only that Scriabin inwardly heard the supra-diatonic Hexad on different degrees of its particular scale or (if we have to assume it each time as a Tonic chord) in different "modes."

The obvious drawback of Scriabin's chord is that the transformation of any whole step of the "neutral Hexad" into a sesqui-step, in order to make it resemble the "large" interval (E-X) of the supra-diatonic Hexad, automatically affects one of the adjacent whole steps, which is thereby transformed into a half step. This new, though lesser disparity between the two chords in question is inevitable under the conditions of our present tempered system and represents one of the negative factors which prevent the further evolution of even a most rudimentary system of supra-diatonic harmony. It explains, in turn, all the subsequent phases through which modern methods of composition have passed since Scriabin. The impossibility of establishing any new harmonic rules on the one hand, and the inadequate intonation of the existing tonal system on the other, prematurely accelerated the historic process and soon led to a "free" use of the twelve-tone chord, as exemplified by Schönberg and his group, or to polyphonic constructions based upon it—Polytonality, which represents but a particular instance of Atonality which has already reached its apex.

With no other path in sight, as far as harmonic and polyphonic complication is concerned, and with the still existing form of tempered intonation, the modern composer is now compelled to choose between "musical externalism" (aiming at nothing but variety of purely "sensory" effects) and the misrepresentation of his ideas by the inadequate tonal system. To avoid turning back or compromising by mixing the old creative formulae with the new, as many do at present, only one way out is possible: to break with the old tonal system and accept a new one logically evolved therefrom.

BREAKING WITH THE OLD

This is not the *easiest* way out—far from it. Even with the new system already at hand, the actual "transplantation" of the composer to unfamiliar "supra-tonal soil" represents a problem far more difficult than appears at a casual glance. It is not only the matter of a new musical instrument, on which anyone could immediately create "supra-tonal symphonies." The composer must first accustom himself to new acoustic relations, probably a slow process on account of the obstacles to be surmounted. The previous tonal system, especially its tempered intonation (rather solidly rooted in every musician's mind at the present time), are his two old partners, to get rid of whom is not simple. Even the pure intonation of the familiar diatonic scale, oddly enough, strikes his ear now as sounding somewhat "false," until he gets used to it. So it is natural to expect that the new scale, be its intonation pure or supra-tempered, will at first displease him. Therefore special methods of ear-accommodation will have to be

found. The establishment of new and, at least, rudimentary rules of harmony and counterpoint (presupposing, of course, an entirely new classification of consonances and dissonances) would probably represent the next and no less complicated problem to be tackled before any "supra-tonal" musical compositions could be created at all, before even the simplest class-room harmonizations based on the supra-diatonic scale could be properly executed. These rules, when definitely established and codified, will serve as the educational background of composers intending to create "supra-tonal" music, and will have to be thoroughly mastered at the very outset of their career, no matter whether they strictly follow or intentionally and judiciously transgress them later on.

So in practically every way, and from the very bottom up, modern composers, especially the young generation, are to be re-trained and concurrently re-disciplined after the relaxing effect of "permitting" Atonality which is now historically doomed and bound to vanish with the sure advent of organized Supra-Tonality, just as "all-permitting" Infra-Atonality gradually yielded towards the close of the Middle Ages before victorious and organized Tonality. These composers have to become

fully aware of the fact that we are now passing through a period of some sort of *New Medievalism* in tonal art (perhaps, too, in other departments of life and culture). This inescapable evolutionary stage, however, may be lived through perhaps with comparative ease, even though not with race-track speed, if actual and conscious efforts based on scientifically positive methods (not mere "creative experimentation") should be exerted towards the practical exploitation of the new scale, whose introduction in music is now urgently dictated by the inexorable laws of historical logic. It is, of course, not difficult to foresee that a great number of problems—technical, acoustical, theoretical, psycho-physiological, pedagogical, etc.—besides those briefly outlined here, would immediately arise and would have to be scrupulously worked out. It is hardly necessary to add that no single person is in a position to undertake this gigantic task. A special institution equipped with the necessary means and guided by experts in all its branches will have to be established for that purpose. And the sooner the better, before musical creative art with its vital and inwardly stirring forces becomes self-poisoned for lack of a natural outlet.