



## A problem of tonality (Pentatonic metamorphosis)

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In his *Folkloristische Tonalitätsstudien*,<sup>1</sup> whose exceptional merit has long been obscured by a few peculiarities of style, Hugo Riemann, basing his argument on previous work by Erich Fischer,<sup>2</sup> is occupied at length with a characteristic feature of certain pentatonic melodies, namely the “*Systemwechsel*”, or passage from one system into another.<sup>3</sup> During the course of these melodies, we see two or more “scales of five notes” following one another or alternating, with or without periodic and final return to the starting point. This will be the subject of what follows.

“*Systemwechsel*” is directly translated as “system change,” and only the length of this designation hinders its adoption. The succession of two different scales being, according to present orthodoxy, synonymous with “modulation,” that term might seem suitable if only it did not relate too specifically to the harmonic domain, which it is important for us to keep separate. Lastly, the modulation operating (at the mercy of the same orthodoxy) by the displacement of a given series, we might be tempted to accept the technical term “transposition.” This is inadvisable for two reasons, however: first, because it gives rise to confusion with “imitation” in the sense of “sequence” or melodic transposition (an occurrence that is frequent in “*Systemwechsel*”, but not unique to it, and which is appropriately considered separately); and second, because it anticipates the explanation of the phenomenon. “Metamorphosis” (*métabole*), more general and less tied to modern notions, thus seems preferable.

We can only grasp the mechanism of system change by turning to the system itself, whose fundamental properties it is therefore necessary to review.<sup>4</sup> We call “pentatonic” the sequence of notes sounded by the black keys of the piano (an

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\* [Notes by the translator are put in square brackets. The eds.]

<sup>1</sup> Leipzig, 1916.

<sup>2</sup> “Beiträge zur Erforschung der chinesischen Musik,” in *Sammelbände der Internationalen Musikgesellschaft*, XII (1910–1911): 153–206.

<sup>3</sup> Notably pp. 25–30, 56, 67–68, 70, 76, 83, 85, 102.

<sup>4</sup> More details in “Sur Une Mélodie Russe,” *Musique russe*, II (Paris: 1953).

overly cursory definition, but one with which scholars such as Helmholtz were content, and that suffices to set forth the concept). Transcription of a similar sequence on the staff involves either five sharps or five flats, an inconvenience we avoid by raising it a semitone, which gives us, in the treble clef and without the aid of ledger lines,

*D-E-G-A-B-D-E-G*<sup>5</sup>.

The lack of any semitone “is what leaps to the eye at once” in this row, in which, furthermore, the cluster *G-A-B*, which Riemann gave the Greek name *pycnon*,<sup>6</sup> is only present once (whereas *D-E-G = A-B-D*; *E-G-A = B-D-E*, etc.). The *pycnon* designates the system to which it belongs.

If, with a view to an extensive comparison, we transpose all the pentatonic melodies into the same system, whose components we number in order to be able to identify them easily, the numbering will start logically from the *pycnon*: 1-2-3 in what follows will designate *G-A-B*. We will then say that we are “in the *G* system,” explaining simply in this way that *G* is found at the base of this tonal structure.

A significant interval of a step and a half (a “minor third”) isolates the *pycnon* from what surrounds it on two sides (*E-G* and *B-D*); it is here that two notes, secondary and variable but nevertheless “*systemtreu*” (inherent to the system), are very often inserted: the *pyén* of Chinese theory, which will soon occupy us in particular.

Let us nevertheless already note that the presence and absence of the *pyén* have troubled analysts in equal measure: absent, they have necessitated the reckoning of a “defective” heptatonic; present, they have obscured the pentatonic framework, the number of notes exceeding five (even though the double form of the two “adjuncts” can carry this number to nine in some cases, a sign that, far from nullifying the presumption of an underlying pentatonicism, on the contrary justifies it *a priori*).

Continuing beyond the *pycnon*, the numbering will assign to the *pyén* the sequential numbers 4 (*C* or *C* sharp, or, to simplify, “low” 4 and “high” 4) and 7 (*F* or *F* sharp - “low” 7 and “high” 7). By giving the same numbers to the same degrees in all octaves, but underlining the low ones and placing a line over the high ones, we will have (*pyén* included):<sup>\*1</sup>

<sup>5</sup> The transposition *G-A-C-D-E-C-D* [sic] ..., although perhaps better, because more “neutral” (V. Jacques Handschin, *Der Toncharakter* (Zurich: 1948), 41), necessitates writing in the uncommon clef of first-line *C* [i.e., the soprano clef].

<sup>6</sup> More precisely, a “*Grossterz-Pyknon*” (of a major third), as opposed to a “*Kleinterz-Pyknon*” (of a minor third), which he believes he can confirm in the most conjectural part of his demonstration.

<sup>\*1</sup> [All of the musical examples were reset as part of the process of republishing this article. In several cases, the text in the original publication was illegible, so additional documents (in some cases the sources cited by Brăiloiu) were consulted, with the text in the reset examples following the text in those documents. In general, however, the reset musical examples attempt to follow Brăiloiu’s, even in instances of apparent error (e.g., “exelsis” in the seventh musical example, or the designation of the second bar of the thirty-sixth musical example as in 5/4 time). B. D.]



Fig. 1

This is the representation of a music in itself (of a “system,” we would say) having for its conditions, on the one hand, its specific tonal nature, and on the other, the distinctive constraints that its relative poverty imposes and the specific resources it offers.

The tonal nature of the pentatonic is revealed, in the first place, in the functional indifference of its principles, harmonic as well as melodic. Not only no “attraction” makes itself felt<sup>\*2</sup>, but its 1, 2, 3, 5, and 6 can each serve as interior or final cadence, so much so that we would be seriously in error in wanting at any price to assign the pentatonic a tonic or indeed a “fundamental.” The alternation of concluding pitches occasionally taking on conventional appearances, Riemann actually described the “uncertainty between parallel tonalities” he perceived when the 1 and the  $\underline{6}$  (G and low E) took turns at points of rest, but it is self-evident that such an interpretation is little more than a manner of speaking based on our *solfège*.

Its lesser wealth compared to the heptatonic, just like the ordering of these terms, additionally obliges the pentatonic to the systematic use of a play of melodic idioms that is constant and, in the opinion of Kodály,<sup>7</sup> so typical that foreign notes, even occurring in rhythmically accented positions, fail to change the structure of the system so long as the “pentatonicisms” (Riemann) remain apparent.

First in the list of these commonplace idioms are certain sequences “by conjunct motion” of three, four, or five degrees (as well as their inversions and “disjunct” variants), which abound in Roman cantilena and European folksong. These are, among others, 3-2-1- $\underline{6}$ - $\underline{5}$  or  $\underline{5}$ - $\underline{6}$ -1-2-3 (“descent to the  $\underline{5}$ ” or “ascent toward the 3”), which count off each of the constituent notes in turn and are occasionally connected one to another:<sup>8</sup>

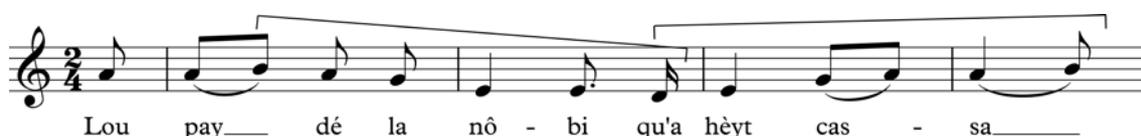


Fig. 2

<sup>\*2</sup> [Brăiloiu seems to be referring to the attraction that certain western scale degrees are perceived to have for others (e.g., the way the leading tone is drawn to the tonic). B. D.]

<sup>7</sup> Zoltan Kodály, Dénes Bartha, *Die Ungarische Musik* (Budapest-Leipzig-Berlin: 1943), 19.

<sup>8</sup> Abbé Léopold Dardy, *Anthologie Populaire de l'Albret* (Agen: 1891), 32.

and (with or without omission of the 2) 1-(2)-3-5-6, as in “En passant par la Lorraine” (By way of Lorraine):



Fig. 3

as well as 5-3-(2)-1-6, or the opposite (as in Scotland and in [Debussy's] “La fille aux cheveux de lin”):<sup>9</sup>



Fig. 4

We will add here the well-known trichords 5-6-1:



Fig. 5

or:<sup>10</sup>



Fig. 6

6-1-2:

<sup>9</sup> Nelly Diem, *Beiträge zur Geschichte der schottischen Musik im XVII. Jahrhundert* (Zurich-Leipzig: 1919), 157.

<sup>10</sup> Joseph Canteloube, *Anthologie des Chants Populaires Français*, II (Paris: 1951), 230.



Fig. 7

5-3-6:



Fig. 8

and 1-2-3 (the *pycnon*), on which hundreds of French songs are built:<sup>11</sup>

Fig. 9

Finally, conclusions by  $\underline{6}$ -1 ( $\underline{6}$  replacing the absent heptatonic 7):<sup>12</sup>

Fig. 10

and by 1- $\underline{6}$ , in the Scottish fashion:<sup>13</sup>

Fig. 11

<sup>11</sup> Gaston Mirat, *Chants Populaires du Béarn* (Paris: 1936), 40.

<sup>12</sup> Canteloube, *Anthologie*, II, 197.

<sup>13</sup> Riemann, *Tonalitätsstudien*, p. 12 (after Moore).

The Chinese masters derive the pentatonic from a progression by fifths and fourths:



Fig. 12

which nothing in practice contradicts. As for the *pyén*, they would emerge from an extension of this truncated cycle leading to *F* sharp and *C* sharp, and this is what, on the contrary, the facts formally contradict: the learned music of China itself and, even more, the folk music of all parts of the world remain manifestly unaware of the rational “high” 4 and 7.

Distancing himself on this point from his far-eastern predecessors and placing the center of the system arbitrarily on our 2 (*A*), Riemann decrees that the *pyén* are determined (*bestimmt*) as the upper and lower minor third of this “*mèse*,” with only “low” 4 and “high” 7 meriting the designation “*systemtreu*.” But considering that he gives this premise no kind of justification, we will not follow him any further than the celestial theorists.

In truth, what surprises us at first glance is the fundamental instability of the 4 and the 7: they are obviously irregular “*Füllsel*” (fillings), and more than one melody exhibits “low” and “high” 7s in alternation:<sup>14</sup>



Fig. 13

or else “highs” in one octave and “lows” in the other:<sup>15</sup>



Fig. 14

This is also borne out with the 4:<sup>16</sup>

<sup>14</sup> I.V. Nekrassoff, *50 Chansons du Peuple Russe, men's choir*, no. 44 (St. Petersburg: 1901).

<sup>15</sup> E. Lineff, *The peasant Songs of Great Russia*, I, no.1 (1905).



Fig. 15

The exclusive association of the two “low” *pyén* or of the “high” 7 and the “low” 4 is common; rarer is that of the two “high” *pyén* or of the “high” 4 and the “low” 7. The choice of any of these combinations apparently does not obey any technical necessity.

These first observations will be of great help in penetrating the apparatus of metamorphosis, provided the behavior of the *pyén* is familiar to us.

The two “auxiliaries” commonly come up in unaccented places, either to fill, without delaying, the spaces that separate 6 from 1 and 3 from 5 (“passing notes”), or as neighboring notes (“*Wechselnoten*”) or “light” appoggiaturas (marked below with the symbol  $\cup$ ). Consequently, we will hear:



Fig. 16

instead of:



Fig. 17

or (in Rumania):



Fig. 18

varying:

<sup>16</sup> Sirvart Poladian, *Armenian Folk Songs* (Berkley-Los Angeles: 1942), 10 (after Komitas).



Fig. 19

or again:<sup>17</sup>

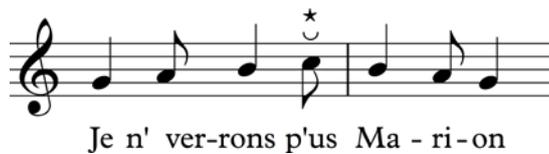


Fig. 20

which means:



Fig. 21

and:



Fig. 22

which is equivalent to:



Fig. 23

<sup>17</sup> Lucien Decombe, *Chansons Populaires Recueillies dans le Département d'Ile-et-Vilaine* (Rennes: 1884), [no.] 52.

As long as they limit themselves to these subordinate functions, the *pyén* are easily identified, first for their rarity, and second for their weak influence. As Riemann demonstrates, “they can be omitted or replaced without harm” and do not give rise to any uncertainty. Similarly, we can only approve of Closson for writing,<sup>18</sup> “In many of our simplest heptatonic melodies, semitones are only touched on in passing; the core is pentatonic.”

Nevertheless, it sometimes happens that 4 or 7 falls on a “strong beat” and that, accented (which we mark by >) it plays the role of a “long appoggiatura” or a “delay,” not only, by descending motion, of the 3 by the 4 or of the 6 by the 7, but also, by ascending motion, of the 8 by the 7 or the 5 by the 4. A classic example (4-3):



Fig. 24



Fig. 25

Nevertheless, the *pyén* is not freed: it remains, as the Chinese have it, something that “becomes” what neighbors it.

But the accentuation sometimes becomes heavier, as if by accident, on a “passing” 4 or a 7, making it equal to the constituent degrees. If, in the following “descent to 5,”<sup>19</sup> the negligible “high” 7 leaves the pentatonic outline intact:



Fig. 26

conversely, in this descent,<sup>20</sup> the newcomer is strongly established:

<sup>18</sup> Ernest Closson, *Eléments d'Esthétique Musicale*, 3rd ed. (Brussels: 1927), 54.

<sup>19</sup> Gaston Paris, Auguste Gevaert, *Chansons du XV<sup>e</sup> siècle* (Paris: 1875), no. 31. [The note values shown are one quarter the length of those in the source.]

<sup>20</sup> *Ibid.*, no. 136.



Fig. 27

And it is in this way that, in the opinion of many writers, pentatonicism would have evolved towards hexatonicism and heptatonicism, in a nutshell.

In the excerpt cited, we are not yet there. The effect produced by the incorporation of the “strong *pyén*” is less an enrichment than a change. What follows plainly reestablishes the initial system; the feeling nevertheless remains with us that a second has been touched upon – in other words, that there has been a metamorphosis.

The cause of this (as Riemann explains so well, but in such difficult language) is that the accented “high” 7 has caused a new *pycnon* to emerge, marking a new system. The sequences *G-A-B* and *D-E-F* sharp being the exact image of one another, it follows that, if the first characterizes a *G* system, the second creates a *D* system. The intrusion of an accented “high” 4 would have identical consequences: it would engender the *pycnon* *A-B-C* sharp, establishing an *A* system.

In the two cases, the “high” *pyén* become degree 3 of the new pentatonic order, while the “low” *pyén*, determining the *F* and *C* systems, would become their degree 1.

Just as the *pycnon* on its own indicates a system, the major third 1-3 on its own evidences a *pycnon*<sup>\*3</sup>: unless that interval is explicit in the sequence where a melody seems to deviate, we can not speak securely of metamorphosis; conversely, if the interval is explicit, we are justified in relying on this decisive evidence. Thus:<sup>21</sup>



Fig. 28

We will be even more certain of metamorphosis whenever all three elements of the *pycnon* are expressed, and this is the case in *Florés*<sup>22</sup>

<sup>\*3</sup> [The author is observing that the notes of a pentatonic collection only generate a single instance of the interval of the major third, which is found between the bottom and top notes of the *pycnon*. B. D.]

<sup>21</sup> N.E. Paltchikoff, *Chants paysans* (St. Petersburg: 1888), no. 85.

<sup>22</sup> J. Kunst, *Music in Flores* (Leyde: 1942), 92.



Fig. 29

as in Scotland<sup>23</sup>



Fig. 30

or in the French Pyrenees.<sup>24</sup>



- Cou - ro se - ra l'i - bère? - Cou - ro se - ra l'es - tiu?  
 - Le joun de Sant Mi-quèl - Le joun de l'As-cen - siu

Fig. 31

Considered without any scholarly prejudice, these material truths authorize two conclusions:

- (1) That the mutability of the *pyén* permits the reproduction of the *pycnon*-model *G-A-B* starting from the 2, the 5, the “low” 4, and the “low” 7.
- (2) That, consequently, four paths are open to a melody that escapes the *G* system: toward the systems of *A*, *D*, *C*, and *F*.

The transition is not always as abrupt as in our last examples. Usually, a connecting episode, playing on the degrees common to the two successive scales, initiates the entrance of the second.<sup>25</sup>

<sup>23</sup> Riemann, *Tonalitätsstudien*, p. 10 (after Bunting).

<sup>24</sup> Jean Poueigh, *Chansons Populaires des Pyrénées Françaises* (Paris-Auch: 1926), 86.

<sup>25</sup> Alexis Chotin, *Corpus de Musique Marocaine...*, II, (Paris: 1933), 69.



We will grant that, in many melodies, the proliferation of the *pyén* obscures the pentatonic structure so thoroughly that it escapes us at first glance:<sup>29</sup>



Fig. 36

With the exception of the last measure, where we find the common 4-3 “long appoggiatura,” all of the *pyén* are fleeting, and the hint of the “descent to the 5” (marked by \*), no less than the cadences by 2-6 (\*\* and \*\*\*\*) and by 1-6 (\*\*\*), immediately make us prick up our ears. But if we are happy to set alongside one another all of the notes employed, as we have done, the series that they form, cluttered with extra notes that are at first indecipherable, will clearly pose a puzzle to any mind trained by the Conservatoire:



Fig. 37

The already abundant materials we have at our disposal in no way lead us to believe that, other than the four that we have seen, one or more different paths could lead out of a given pentatonic environment. The quotations from Riemann only lay out the *G-D*, *G-F*, and *G-C* trajectories, and the very mobile melodies studied by Fischer add only *G-A*. Hundreds of others go no further. Unless there are unlikely discoveries, the possible exits are limited to these.

Our logic might desire that each of these exits could at the very least produce, around the new center to which it gives access, a second tonal constellation imitating that which proceeds it, and this is certainly what would happen if the widening of the tonality had as its motivation an attractive function.

Unfortunately, the documents disappoint our expectations once more: we know of none where metamorphosis opens up the circle delimited by the dimorphism of the *pyén*. Certainly when, after a second scale, it takes up a third instead of retracing its steps, it is difficult to know to which of the previous ones it

<sup>29</sup> M. Lysenko, *Recueil de chansons ukrainiennes*, III (Kiev), no. 3.

will correspond. Little matter: it is only ever one of those that normally emanates from the first:<sup>30</sup>

1a

Mar - gue - rite elle est ma - la - de      Mar-gue-rite elle est ma  
Il lui faut le me - de - cin,

la - de, Il lui faut, faut, faut, Il lui faut, faut, faut

Fig. 38

Failing unlikely discoveries, we will confidently claim that a first system comprises, with its four satellites, a closed world.

In addition, no visible hierarchical order reigns within this world; without additional evidence, our examples are sufficient proof that from the *G* system, we enter just as well into those of *A* and *F* as into those of *D* and *C*. Arising alike from the preference for one, their equivalence is total.

Riemann, in specifying that *A* (2) is found at the distance of a second *or a second fifth* from *G* (1), actually builds an interpretation that deliberately ignores the evidence he so clearly formulates himself. Far from simply setting out an inconsequential acoustic truth, he means to stipulate that, just as there are two fifths from *G* to *A*, the *A* system is only attained by a double upward transposition from that of *G*.

In order for this hypothesis to be verified, a first fifth (*D*) must, in practice, prepare the arrival of the second, and Riemann unhesitatingly holds that metamorphosis always turns initially towards the “*quintverwandt*” (fifth-related) system, even though there exists no convincing proof of this, and even though his own citations contradict it (see example 29).

At least his surprising dictate regarding the “high” 7 and the “low” 4 – solely declared “*systemtreu*” – is now illuminated: it seeks, whatever the cost, to reconcile the pentatonic with not only the heptatonic, but, beyond that, our contemporary tonal conceptions. By arbitrarily removing two embarrassing *pyén*, only the metamorphoses by *F* sharp (3 in the *pycnon D-E-F* sharp) and by *C* (1 in the *pycnon C-D-E*) remain, the *G* system only being able, in other words, to connect to those of *D* and *C*. From there to making of the two extensions a dominant and a subdominant, and to seeing in the pentatonic a prefiguration of the contemporary major, it is no more than a step – and it did not deter our expert.

<sup>30</sup> Canteloube, *Anthologie*, II, 79.

In order to succeed at it, what was necessary, after calling on arbitrary principals, was the deliberate omission of anything that could actually hinder an argument directed toward a goal established in advance.

Despite this, the *A* system is very much located at the second, and not at the second fifth, of the *G* system, and is distinguished from that of *C* by the modified *pyén* that it implements, not by the number of fifths that are inserted between their presumed “fundamentals.”

Certainly, we must admit that Fischer is right when he shows us that a very rapid change of system (“dense metamorphosis”) combines the scales so well that in places we would find it difficult to discern in which one we are moving if the return of the same phrases did not help by emphasizing the importance of notes initially regarded as accessories (or the opposite). Even so, the variants often deliberately adopt a new series, and a doubt persists here and there:<sup>31</sup>



Fig. 39

Are we really in *G* in the first measure? Do we touch on *A* in the second? Do we hear *G* in the third? Does the fourth turn towards *D*?

We appreciate that the crossing overlap of the systems ends up preventing their dissociation; perhaps heptatonicism came into being in this way. It will still have a long way to go before our present modes appear, the foundation of harmony.

Certainly, it's a nicely reassuring fiction - a modern tonality springing from the pentatonic fully armed with its seven diatonic degrees and its three central harmonic functions. Quite evidently fiction, nonetheless.

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<sup>31</sup> Fischer, *Beiträge*, 183.