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Jacques Amblard
The “stacking of fourths”.
A technique uniting various aesthetics of the 20th century.

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Abstract

Some composers of the early 20th Century such as Scriabin, Milhaud, Bartók, Schönberg and before them, Mahler, imagined some chords stacking up not thirds any more but fourths. What was their purpose? Did they employ this process for the same reasons? If not, however, did this technical bond between different aesthetics present some kind of historical necessity?

Key words : harmony, stacks, superimposition, fourths, Mahler, Schönberg, Ravel, Milhaud, Bartók.

Introduction

At the end of the first movement of his Symphony No 7 (achieved in 1905), Gustav Mahler chose to try out a new melodic process. The melody of the brass section stacked up perfect fourths, in a globally ascending movement. The process was also more or less harmonic: the melodic stack of fourths sounded like a new type of arpeggio, no longer drawing a lot of thirds but fourths. Indeed, the traditional structure of all the chords, in tonal music, was always a superposing of thirds (at least concerning the root position of the chords), that's why a superimposition of fourths sounds like a new arpeggio, and that's probably what Mahler himself was intending to create, in the beginning of the 20th century. This new “harmonic creature” was assumed all the more by the Viennese composer since it was powerfully proclaimed by five horns in unison.

1. Schönberg and the fourths

It is not surprising that, only one year after Mahler, it was Arnold Schönberg who chose to renew the same harmonic idea, which could therefore be considered, at that time, to belong to the Viennese modernity. More than simply renewing the process, Schönberg magnified and even perhaps systematised it. Besides, this *Chamber symphony* No 1, op. 9 (composed in 1906), for 15 solo instruments, is traditionally called the *Fourths Symphony*. In this piece, Schönberg chose to break with traditional romantic symphony, notably with the so-called artificial succession of separated movements. Here, the movements are supposed to be played through. However, a division of the movements remains, and it is in the beginning of the third movement that a stack of fourths is systematically presented. Here, in an exemplary way (we might say a *pedagogical* way),

the fourths build the whole movement. They begin it. The stack is clear and simple. It is melodic and harmonic, strictly ascending (not like in the Mahler's Symphony, where the melodic curve is only globally ascending and keeps some saw-tooth patterns). The notes come one by one, each time at the fourth above the previous one. It is clearly some kind of new "harmonic manifesto": from now on, chords are built with fourths, not thirds. However, this manifesto only concerns this particular piece by Schönberg. Superposing fourths never became a style in the Work of the Viennese composer, as it did in Bartók's (as we will see further on).

2. Ravel and Milhaud.

When Ravel chose to magnify the interval of fourth, he did it late in his career, and perhaps in a quite incidental way – because he wanted to generate a very dark and raw atmosphere, in the beginning of the *Piano concerto for the left hand* (1929-1930). The double basses just expose the four natural sounds of their strings (that are E A D G, each note separated by a fourth from the next one) in a fast sweeping up and down movement. Systematically stacking up the interval (very high), like Schönberg did in his *Chamber symphony*, was out of the question. However, such a "new harmonic systematic superposing" was attempted by the French, only six years after Schönberg, at the very beginning of the ballet *Daphnis and Chloe* (1912). But in Ravel's work, of course, it was a matter of superposing perfect *fifths* (and not perfect fourths)¹. But both stacks seem to find a common function of melodic "discovery", perhaps because both superpose perfect intervals and thus, make it possible to reach the twelve degrees (semi-tones) of the scale (or at least a new note at each degree, each occurrence of the superimposition). Like in the Schönberg's *Chamber symphony*, Ravel presented his new "chord" with slow successive sustained notes, from lower to higher parts, and in the *beginning* of the movement, as if the composer were softly opening something, introducing the different pitches or registers successively before writing anything. Some kind of *mise en abyme* seemed to occur in both cases: extremely *progressive*, the music seems to look for itself and then, to compose itself. Thus, it might "speak" about the beginning of every composition, slowly "finding its degrees on its own".

The French composer Darius Milhaud, in his ballet *Le boeuf sur le toit* (1919), also made use of a small stack of two fourths. In the refrain of this rondo, which displays the simple tonality of C major, the clarinet plays a fast three notes motif (B flat, E flat, A flat, ascending and descending). Thus, this motif clearly intends to exhibit two fourths stacked up upon each other. For Milhaud, the aim of the process was probably multiple. First of all, it made it possible to superpose, on the theme in C major, three notes quite far from this tonality and sounding as if in E flat major. In the end, the result sounds polytonal in a quite economical way (just adding three notes to the clarinet part). It certainly appeared interesting for a young composer already concerned by polytonality (as he was all his life long). Besides, a more famous user of polytonality, Stravinsky, had the idea of

¹ Later, in the very beginning of his Violin Concerto "to the memory of an angel", Berg stacked up fifths (G, D, A, E) to magnify the strings of violin, as Ravel did, in a way, to "celebrate" those of the double bass in the beginning of his *Left hand concerto*.

superposing fourths one year before (in his *Four pieces for string quartet* written in 1918), with the same aim.

Moreover, this process of stacking of fourths (and more generally “fourth exhibition”), was probably, already at this time, in the mood of the times (in the *air du temps*). Without speaking of a real “fashionable” technical idea, we could bet that several different *avant-gardes* had naturally thought about this simple way of building some modernity (during times when being modern appeared particularly crucial to almost all the artists), eventually without being influenced by each other. We shall come back to this later.

3. Bartók

Four years later, in the *finale* of the *Dance Suite* (1923), Bartók showed the same project as Schönberg (and as Ravel with his fifths): he superposed fourths in a very clear – we might again say “pedagogical” – way. Perhaps “mise en abyme” again, the stack is simple, “natural”, and high. It appears at the very beginning of the movement (like in the *finale* of the *Chamber symphony* by Schönberg). It begins with the low parts and ends with the highest ones (the double basses first present there note, then the cellos, etc.). The main novelty is that Bartók didn’t write sustained notes but fast repeated ones: he might have preferred to generate a more rhythmical atmosphere, probably to achieve his usual folklorist project. Therefore, the process is subtly presented in a different way: in a more rhythmic, dancing, thus probably more *popular* way. As usual, the popular development comes after the first sophisticated experimentations (in this case, 17 years after Schönberg’s *Chamber symphony*).

Above all, the use of the fourth in general, and sometimes of the more particular *stack* of fourths, developed itself enough, in the Work of Bartók, to become almost an element of style. The *Concerto for orchestra* (1942-1943) begins with just such a progressive superimposition of fourths. The Second Concerto for violin and orchestra (1928) contains a powerful stack, claimed by the brass (and sounding like some kind of “fourth fanfare”) and, for once, globally descending.

The fact that the fourth may have found such an importance in the Work of Bartók may be bonded to the frequent use of the pentatonic scale by the Hungarian. Indeed, Bartók, as ethnomusicologist, had discovered that pentatonic scales were part of the most authentic first Hungarian traditional music. Thus, the interval fourth seems “often found” by those scales and sounds, in a way, like a “pentatonic third” (the pentatonic interval that is often obtained when jumping a degree). Bartók probably considered that the fourths should have been “particularly Hungarian”. We mentioned before that they seemed to be, in the beginning, more Austrian (Viennese). The purpose is not, therefore, to call them “Austro-Hungarian”. It is better to notice that the process of stacking fourths seemed interesting enough to several composers from various countries, to make of them intimate parts of their most modern language, each time for a different reason and with a different aesthetic justification. Without mentioning in detail the case of Scriabin, it is well known that the fourth (perhaps not the *stack* of fourths in particular) was also an important harmonic (and melodic) element of his

second style. Thus, this use might have found some totally different justification in the case of the Russian, and probably a mystical one.

4. After World War II

We have chronologically mentioned the cases of Mahler, Schönberg, Ravel, Stravinsky, Milhaud, Bartók and Scriabin. Many other composers could have been quoted, concerning the new harmonic stacks, during the first half of the 20th century. Later, after the Second World War, superposing fourths had certainly become “classical enough” to lead Messiaen to mention the process in his *Techniques de mon langage musical* (1944). Thus, this process was not so obviously stylistic in his language. That is precisely what is interesting in this explicit reference: probably the fourths had already become necessary ingredients of modernity, all the more necessary since they were used by different aesthetics. The French composer could have wanted to prove, in his so called *Techniques* (perhaps more like a manifesto, a justification), that he was using “all the elements of modernity in his composition laboratory”. Besides, Messiaen’s ambition (like that of Boulez and other composers, at this time) was of course to realise the difficult synthesis of the various movements of the early 20th century. Thus, like real godsend, the fourths already seemed to build a small synthesis by themselves. However, Messiaen remained a harmonist, and superposing fourths could have appeared quite harmonically stiff to him. That’s probably why the process stayed very occasional in his Work. It comes perhaps more often in what he himself called his “*style oiseau*” (his “bird style”) insofar as this type of writing appeared, for once, more polyphonic than harmonistic. The *style oiseau* used to enable a particular part to build fourths in its corner, like a specific bird could build his nest while other birds would sing in their own various ways. The desired result was precisely rich and varied, anyway, like a mirror of abounding natural life. We can mention, for example, *Le réveil des oiseaux*, one bar before number 27. The divided second violins (5 to 8) play parallel stacks of fourths, while many other parts choose to draw more melodic birdsong-like motifs. At the same time, those fourths allow their post-impressionist way of moving themselves to be displayed (in a *parallel* way). We can also notice that not all the fourths are perfect. Some are augmented (tritones). Thus, the first stack is G, C, F sharp, B (and contains the tritone C-F sharp, the other fourths remaining perfect.)

In fact, after the war, in the works of various composers, the stacks of fourths seemed to “emancipate themselves” a little, admitting some augmented intervals in their constructions. Henry Dutilleux apparently liked to write such “irregular” stacks. For him like for Messiaen, they came probably in his Work, at first, because he also wanted to synthesize all the aesthetic movements of the passed. But he integrated them much more often than Messiaen, notably because he was probably less afraid than the latter of their dense supply of various degrees (we will return to this later on). Whereas Messiaen was often looking for a particularly clear style, Dutilleux perhaps allowed himself more involved, complex, mysterious atmospheres. It might be why those involved, “heavy” stacks currently

integrated his pieces and became namely *stylistic*, perhaps like in the work of no other post war composer.

5. Jazz and movie musics [from here, English not corrected yet]

What may surprise, in the great development of this process during the 20th century, is that the latter became classical in different aesthetics, when it seemed to be, in the beginning, a quite formal (we could say “intellectual”) process: Schönberg seemed to look for an exit to the classical way of building chords (with thirds). But this exit, *a priori*, was only visual, theoretical, unfounded or at least without deep foundation. Indeed, the thirds, used in the chords, based themselves on real physical legitimacy: the fact that they “fast appear in the harmonic spectrum” (they are parts of the very first harmonics of each spectrum and, for example, separate already low harmonics like the 4th, 5th, 6th and 7th). Thus, the traditional chords of tonal music imitate that spectrum and, in that way, imitate “nature”. For the whole 18th century (and notably Rameau), the Renaissance and the whole Antiquity since Pythagoras, the chords justified themselves from that spectrum. Therefore, breaking with that secular tradition, Schönberg showed his usual audacity and a formalist way of mind. But the remarkable thing is that he was followed, for once, by quite different aesthetics. Notably, his process, applied to his *atonal* music, was often renewed in *tonal* aesthetics. It is not surprising that Stravinsky also used the process, because the Russian was probably also often inclined to a certain formalism. But it might be more surprising that the French neoclassicism (and for example Milhaud), was tempted by such stacks. Finally, if it is often considered that the beginning of the 20th century is represented by four great different avant-gardes – the French “impressionists” (notably Ravel), the Viennese school, Stravinsky on his own (for his invention of a great mechanical and/or primitivist *ostinato*) and perhaps also Varèse, for his attach to the pure timbre – three of these four avant-gardes and perhaps the most important of them (as a matter of fact all those composers, Varèse excepted) were concerned by this particular technical idea. The reason might be that the latter could fast become something else than a simple formal “alternative to the thirds”. It contains several great technical advantages. Indeed, stacking up twelve perfect fourths, because of the intervallic exactitude, quickly presents all the semi-tones of the scale. In a way, it “justifies” their presence with a *harmonic*, (a vertical) argument, and not only a dodecaphonic one. This could have appeared practical for the Viennese school, but also for all the many composers interested by total-chromaticism. Also, stacking up only seven perfect fourths, on a certain root note (let’s say C) makes, by chance, a “natural mode”, and as a matter of fact, a very different mode from the one which’s traditionally built on C (the C mode, called also major mode or Ionian mode): it builds the B mode (Locrian mode), thus, the strangest – then eventually the most modern? – of the seven Greek modes. On this same C, the superimposition of fourths fast brings “strange notes”, far away from the C major tonality: even without superposing seven fourths, two or three fourths will quickly bring B flat and E flat. That’s what probably interested neoclassicism, often tempted by polytonality. Finally, we could afford that, during the beginning of the 20th century, in any

superimposition of fourths, the number of stacked fourths may be proportional to the radicalism of the composer: in the examples we shortly developed in this text, Milhaud, the neo-classicist, piled up only two fourths. The more radical Stravinsky and the impressionist Ravel stacked up four. And Schönberg, perhaps the symbol of formalism in itself, stacked up almost twelve.

From now on, we simply presented the development of a musical idea in various aesthetics, but always in written music (what our consumerist society calls “classical music” because that is the way music shops call it, by opposition to “music” which designs pop music or actual *songs* in general: something much more important for these shops). What may appear more interesting is that jazz also finally took over this process. During the 60’s, the hard bop style, perhaps “invented” by John Coltrane, often used superimpositions of perfect fourths, probably because of its inclinations for modal music (let’s not forget that a stack of seven fourth creates a Locrian mode on the root note). More than John Coltrane himself, it was probably McCoy Tyner, the pianist of his quartet, who thought about such stacks, because it remained a harmonic process (and thus, concerning probably more a pianist than a saxophonist like Coltrane). The famous *My favourite things*, for example, currently stacks up perfect fourths.

Then, during the late 60’s and the 70’s, some Hollywood or TV composers, influenced by jazz (or jazzmen themselves in the beginning of their career), such as Lalo Schifrin or Henry Mancini, renewed this harmonic (vertical) idea. By the time, they composed the credit titles of famous serials. For example, Lalo Schifrin signed the score of *Impossible mission* and that of *Bullet*, Mancini that of *The pink panther*. That is probably how the stacks of fourths came finally to the (subconscious) knowledge of many.

John Williams himself, the musician of the first blockbuster of movie history², used to superpose fourths melodically or even harmonically in *Star wars*. During the famous beginning credit titles (where the text appears slanting), a short harmonic stack comes to the brass part, precisely when the credit titles end and when the “camera” goes down to show a great starship. The process seems to betray Williams’s link to the great scores of the 20th century, all the more since his own stack shows a real artistic ambition: an inventive way of difficult fast repeating notes to the brass section (perhaps already used by the French composer Florent Schmidt in the beginning of the 20th century). Moreover, the composer used this process exactly during the first *transition* of the movie (the short moment between the credit titles and the beginning of action, when the camera comes down and literally “dives” into action). This might be because the stacks are heavy, heterogeneous to anything else and can not “live” very long, especially in this – still – tonal music.

Conclusion

As a matter of fact, the process might have appeared “heterogeneous” during the whole century, heterogeneous to any music. Schönberg, perhaps

² According to James Buhler, Williams generated a great part of the film success by giving back a new “mythic content” to the Wagnerian *leitmotiv*. See « *Star wars*, music, and myth », *Music and cinema*, University Press of New England, 2000, 33.

proud of his new technical idea, used it in the beginning of the *finale* of his symphony, like Bartók in his *Dance Suite*. Concerning that, we've employed the expression "*mise en abyme* of the beginning of any musical piece". But in a way, this *mise en abyme* betrays a relative failure. The process certainly appears too peculiar, rigid, systematic, *heterogeneous* and finally impossible to handle. It can only come at an important moment of a work, the beginning, or perhaps the end when, violently symbolic, it becomes a final signature. That is why it remains a sign, a symbol more than a real musical element. Symbol of the beginning for Schönberg, Ravel and Bartók, symbol of a certain (but particularly clear) transition for Williams, it strangely becomes, on the contrary, *end* signature in several movie or TV musics of the 70's and the 80's. Thus, for many of us, conditioned since our childhood by many of these musical slogans, the superimposition of fourths are finally the symbols of the end. The sounds seem to put themselves into stacks like into rows, in the manner of actors at the end of a show, before bowing to the audience. For example, the beginning credit titles of *Staying alive* (1983), starring John Travolta and directed by the actor Sylvester Stallone himself, end with such a characteristic stacking.

For Schönberg, in the beginning of his *Chamber symphony*, this technical new curiosity was *opening* something that the composer of *Staying alive* finally seemed to close. The Viennese composer may have thought that his process was "only a beginning" in the investigation of new musical processes. But the popular music may have answered: "no, on the contrary, this is the *end*, this is the most complicated process that I can tolerate, even if I'm proud of using it". But, for once, let's notice that Schönberg himself, who was often considered like the symbol of atonality and sometimes like the very image of "musical evil"³, has finally influenced musicians who could symbolise the opposite (popular music). Thus, by the time, the famous concept defended by the avant-gardes since the Romanticism and before that, Kant's definition of the so-called "genius"⁴, who was always a little fast supposed to foretell the future, founded here a small proof of its power of prediction.

Summary

The music of the early 20th Century namely developed a technical process that varies the traditional harmony. The latter used to build its chords stacking up thirds (imitating the harmonic spectrum). Abandoning this natural (acoustical) "determinism" of harmony, in a kind of abstract speculation, the new harmony chose to stack up also fourths. Several composers not only from different countries, but from different aesthetics, developed this ways of reaching a significant musical modernity: Scriabin, Milhaud, Bartók, but also Schönberg and before them, one of the privileged inspirers of the latter: Mahler. In this community of employment, and considering the variety of these aesthetics (starting from the neoclassicism of Milhaud to the so called "opposite": the atonal Viennese expressionism), does a phenomenon of absolute "technical need" have to be recognized? In

³ See Esteban Buch, « Figures politiques de la technique sérielle, *Résistances et utopies sonores*, Paris, CDMC, 2005, 213.

⁴ Emmanuel Kant. *Critique of Judgement*. § 49.

this case, the latter curiously transcends all the aesthetic divergences until tonality/atonality antagonism. Nowadays, this very particular harmonic process is even employed in movie or TV music, sometimes like a new symbol of the *end*. This “new signal” may be one of the numerous “final popularisations” of musical processes which are born in very abstract contexts.

Jacques Amblard (b. 1970) is a musicologist, associate professor at the Aix Marseille University (France). His publications concern aesthetics, music of the XXth and the XXIst centuries (for instance in his recent books *20 regards on Messiaen*, Aix-en-Provence, PUP, 2015 or in *Micromusique et ludismes régressifs depuis 2000*, co-authored with Emmanuelle Aymès, PUP, 2017); music and intonation, notably in a book about the French contemporary composer Pascal Dusapin (*Dusapin. The Second Style or Intonation*, Paris, mf, 2017); or musical pedagogy (*Harmony Explained to Children*, mf, 2006). He has also written several novels (like *v comme Babel*, Paris, Balland, 2001 or *Noé*, mf, 2016). He conceived and presented a radio program, concerning musical pedagogy, on the cultural French public radio channel “France Culture”, each week from September 1999 to June 2000. He gave two conferences at the Collège de France in 2007.