



of neutral harmony and rhythm, on which (as a consequence of *Apparitions*) I built my pieces from *Atmosphères* up to the first two movements of the Requiem, led around 1964 to the abandonment of harmonic neutrality and to the construction of intervallic seed crystals – for example, in the final movement of the Requiem and later, more clearly, in *Lux aeterna* and *Lontano*. It led also, after 1968, to the abandonment of rhythmic neutrality, most consistently in the Second String Quartet.

*Q.* So it was a case of a double modification, the modification of a modification. On the analogy of minus times minus resulting in plus, could this not be seen as a return to previously abandoned positions? To put it more plainly, was not the abandonment of the abandonment of harmony equivalent to the restitution of harmony?

*A.* It is of course true that the abolition of non-harmony leads back to harmony. But this newly evolved harmony is not the same as the former harmony – the historical process is irreversible, recurring aspects notwithstanding. The manner in which I use intervals in *Lux aeterna* and *Lontano* reflects my experiences of timbre construction within a harmonically neutral context. That is to say, I treat intervals just as I previously treated timbre complexes. In *Lontano* intervallic structures are subjected to a continual transformation, similar to the transformation of tone colours in *Atmosphères*. The intervals as such are the same as in earlier music, but they are handled in a fundamentally different way: with the sounds of a dead language a new language is being evolved.

For reasons such as these I find myself in a territory in which primary musical ideas and the working out of the composition can no longer be sharply distinguished from one another. The compositional process has been absorbed into the music as conceived directly through the senses, and the raw state already contains traces of the working method. The raw state of which I spoke previously was also not completely raw, since it included a historical pre-shaping. When a composer himself modifies the musical context of a whole era, the work in which this modification occurred exerts an influence over his later ideas, however naïve they may at first appear to be. The primary conception of new pieces contains the imprint of the working processes used in the development of previous pieces. The consequence of this is a feedback effect: the raw state is pre-shaped by experiences gained during composition, and is thus no longer quite 'raw'. The

borderline between raw state and finished article becomes fluid, the naïve idea already contains distinct structural features.

*Q.* So the concept of naïve idea on the one hand and structure on the other is basically false?

*A.* Despite the fluid borderline there is still a difference. The compositional process can be clearly divided into initial inspiration (i.e., the raw state) and subsequent working out. And, in addition, there is frequently a gap between conception and working out, due to the time lapse – perhaps of several years – that may occur between them.

The feedback relationship has more to do with the fact that during the working out process new musical ideas arise: structural deliberations and naïve idea mutually affect each other. And the working method is itself not just a matter of cold calculation: there are intuitive features in the construction just as there are speculative features in the initial idea. The distinction can be better explained in terms of dosage: the primary musical idea is predominantly intuitive, the working out predominantly speculative. And, just as the musical idea conceived by the senses is pre-shaped by historical associations, so too structural processes and working methods are subject to similar pre-shapings: individual reactions to the working methods of other composers, as well as to one's own working methods in relation to earlier works, lead to a constant modification of constructive principles.

In this connection I might once again cite *Apparitions*. My first version of the music that later became the first movement of this work was sketched in 1956 in Budapest, at which time I knew nothing about serial practices, by then fully developed in Western Europe. When at the beginning of 1957 I went to Cologne and soon got to know the music of Webern as well as that of the post-war generation, I came to realise that the technical and structural standards of my Budapest version were unsatisfactory, measured by Cologne standards. Leaving the initial inspiration untouched, I composed in 1957 a second version, in the working out of which my experiences with serial music were absorbed – I emphasize, my experiences with, not the serial technique itself: I reacted to serial music just as I reacted to my own earlier compositional methods, rejecting it and at the same time building on it, modifying it. Equally dissatisfied with this 1957 version, I composed in 1958 a third version of the movement, this time the definitive one. It was only then that I achieved inner consistency and a sufficiently tight network of structural links. My knowledge

of serial music put at my disposal a whole new compositional apparatus, but I was content to regard that just as a *possibility* and made no actual use of it. What I owe to serial music is to a much greater extent an insight into structural relationships and refinements of thought in regard to the subtlest of musical ramifications. A fruitful exchange of ideas with Stockhausen and Koenig proved a decisive factor in my development as a composer, together with a study and analysis of several works by Boulez. It was clear to me from the start that my development would not be along the path of serialism: I was already steeped in compositional assumptions and previous experiences of a totally different kind. The modifications to which my own music was subjected after contact with serialism then exerted their influence, feedback fashion, on serial music itself, producing yet further modifications in its ideas and techniques.

*Q.* Can you explain, with reference to *Apparitions*, in what way the principles of serialism have been modified?

*A.* At that time, around 1957, there were two aspects of serial composition that struck me as problematical.

Firstly, the equal status accorded to all musical areas such as pitch, duration, timbre, degree of intensity. The erosion of intervallic relationships, that is to say, of harmony of any kind, and the consequent reduction of intervallic distinctions, persuaded me initially to dispense with intervals as structural components. I composed sound webs of such density that the individual intervals within them lost their identity and functioned simply as collective interval groups, no longer as separate intervals. However, this meant that the pitch function had also been eliminated: series based on pitch had become meaningless, and their place in the structural pattern was taken by internal relationships of motion and an intricate network of parts. Pitches and intervals now had a purely global function as aspects of compass and note density. There is no serial organization of pitches in *Apparitions*. And by such means the entire basis of serial music – that is to say, the equal status of all musical elements – has been nullified.

The other aspect of serial composition I found problematical was the organization of all the musical elements within a unified plan. In serial music it was axiomatic that a single basic order should be manifest throughout the various areas. There was also a recognizable tendency to regard a pitch series as the starting point, and to arrange the other elements in accordance with that,

even to the extent that the notes as arranged in a series would initially be given numbers. These numbers would then be detached from the pitch series and applied to the areas of duration, timbre, intensity, and later even to wider determining factors such as density, compass, proportions of structural detail, etc. One could also work the other way round: a series of numbers or of numerical relationships – ratios for instance – would be laid down and then applied to the various musical areas. Uniformity of organization was the fundamental tenet of serial music: a quantifiable basic order, a modulus, had to be laid down, and every single part of the composition had to be derivable from the chosen modulus.

I did not see any necessity for this kind of unified treatment of all the elements. Indeed, I detected in it a discrepancy: quantification applied equally within the various areas produced, from the point of view of our perception and understanding of musical processes, radically different effects, so that there was no guarantee that a single basic order would produce analogous structures on the various levels of perception and understanding. On the contrary, adherence to a single basic order led to structures that seemed incompatible. Unity remained fixed at the level of commentary, a verbal description of the composition: it was clapped on the musical events from the outside, and had no direct impact on our minds.

In his essay 'Wie die Zeit vergeht' (*Die Reihe* 3) Stockhausen had pointed out, in connection with Boulez's *Structures I*, the arbitrary co-ordination of an additively constructed duration series (derived from the multiplication of a fundamental duration value) with a pitch series that had not come about by additive means, but was rather akin to a logarithmic progression. Unlike Stockhausen, however, I felt that, even when pitches on the one hand and duration values on the other were governed by the same quantitative regulation – a logarithmic progression, say – the analogy between the two series existed only on the level of verbal description. There was no musically effective analogy, since our nervous system reacts to pitch relationships and duration relationships in fundamentally different ways, and the two areas, though sharing a common context physically, are separated from one another by our diverging ways of responding to them. From a study of physics I *know* that fifth and fundamental tone stand in a frequency ratio of 3:2. I also *know* that frequency is the equivalent of speed, that is to say, it represents the number of

vibrations within a chosen period of time. This knowledge has been acquired through experiments in physics, with the help of a measuring apparatus. When I hear a fifth, however, I *feel* a certain acoustical quality, my sensory perceptions convey no impression of speed, and the ratio of 3:2 (the physical definition of a fifth) plays no part in my understanding. Meanwhile I am accepting without question simple duration relationships as recognizable quantitative elements within a speed range accessible to my perceptions. A simultaneous combination of triplet and duplet, for example, appears directly to my understanding as a time factor of 3:2, without the help of a measuring apparatus. By contrast, it is hardly necessary to point out that those physical speeds which are perceived by my ears in the form of pitches lie (as far as my nervous system is concerned) not in the physical realm of speed, but in an area of the mind in which perceptions are qualitative, not quantitative. For this reason a basic order that postulates a ratio of  $a:b$  as a regulating factor common to both pitch and duration (or speeds) is irrelevant, indeed meaningless in relation to a musical structure, which in structural terms reflects mental rather than physical processes. The  $a:b$  ratio in the realm of pitch is only *physically*, not *mentally*, analogous to the  $a:b$  ratio in the realm of duration or speed.

The discrepancy in the serial outlook lies above all in the unmotivated equation of the physical and mental levels of approach.

I can perhaps make this clearer through a comparison with painting. The colours used in a picture play a significant part in producing an effect on our minds. In physical terms, however, the effect of each colour is the result of the chemical combination of certain dyes. As far as the picture itself is concerned, the chemical composition of the dye is of no immediate relevance, for the colour structure of the picture and the chemical structure of the dye exist on two different planes. The second plane may of course be dependent on the first, but the nature of each is different. I paint with white, the effect 'white' is produced by a certain arrangement of lead and oxygen atoms or of zinc and oxygen atoms, but in regard to the picture it is only the effect 'white' that is significant, not the question whether the dye contains atoms of zinc or lead. In place of zinc and lead atoms one could speak of crystal lattices, electron orbits, light absorption, and so on – each plane has another plane beneath it – but I am painting *directly* with white and only indirectly with crystal lattices.

To return to music: in working out a notional compositional structure the decisive factor is the extent to which it can make its effect directly on the sensory level of musical perception.

*Q.* Have these considerations led you to a complete rejection of serial principles?

*A.* I have been talking about modifications, not total abandonment. Apart from these problems of equal status, analogical form and unification, there are aspects of serial thinking that I have felt to be promising for the development of my own working methods, above all, the principle of selection and systemization of elements and procedures, as well as the principle of consistency: postulates, once decided on, should be carried through logically, but only in those areas in which they are musically relevant. Arising from this, I did find it feasible – while rejecting a uniform treatment of *all* postulates – to build a compositional structure consisting of a heterogeneous repertory of elements. The timbre structure, for instance, could be made to conform to regulations quite different from those governing the rhythmic structure. All that was necessary was to ensure that elements and procedures, once tested and fixed, would then be applied completely and consistently in the area in which their viability had been proved. In this way my compositional working method could be regarded in a very general sense as serial, though not a single series had been employed.

*Q.* Serial music without a series: a contradiction in terms?

*A.* The remark is simply an attempt to find a dividing line capable of definition. My compositional approach might no longer be recognizable as genuine 'serial music', but within it thought processes and methods of working whose roots lay in serial music were preserved.

As an example let me describe some technical aspects of the first movement of *Apparitions*. There are no true series in this, but there are predetermined formulae in the areas of rhythm, dynamics, timbre, pitch, compass, note density, character of motion, formal articulation. There is no single order governing all these areas together: the rhythmic relationships, for instance, are different from the dynamic relationships, and so on. But a relative unity is achieved through the manner in which the various areas are linked together, similar to a machine, which contains various components such as wheels, cogs, axles, belts, etc, the very diversity of which enables the whole apparatus to function as a unit. In the area of rhythm, for example, there is a quasi-serial

repertory of duration elements: a shortest element and a longest, and between these two extremes a stipulated number of duration elements of varying length. (Since I am dealing here simply with matters of principle, I shall not go into detail concerning the ratio of these durations to one another, the number of elements involved, etc.) These duration elements of varying length are not arranged in a series, nor is there any parity in regard to the frequency of their occurrence. Thus one of the main postulates of serial thinking – that all elements, no matter how selected, must occur with equal frequency – has been disregarded. There are more of the shorter duration elements than of the longer ones, and the longest of all is used only once. There is, however, a system of apportionment of duration elements: the length of the shortest element, multiplied by the number of times it appears in the piece, matches the total length of the longest element. A similar process is followed with the other elements: the shorter an element, the more frequently it occurs, and vice versa. The duration multiplied by frequency of occurrence produces a constant.

*Q.* What is the purpose of this apportionment of duration elements? What are its advantages as compared with a duration series? To what extent is this apportionment musically relevant?

*A.* If one constructs a piece on the basis of a duration series in which every element of the series should appear with equal frequency, the longest duration element must of necessity occur as often within the complete composition as the shortest duration element. This results in an over-emphasis on the longer duration elements, establishing a hierarchy that is contrary to the a-hierarchical principle of serial music. A pitch series, a twelve-note series, for example, is structured a-hierarchically, for no note carries greater weight than another; a duration series, on the other hand, is of its very nature hierarchical, for, given an equal number of shorter and longer duration elements, the longer values predominate in terms of time.

The discrepancy between duration and pitch series rests on the basic difference of our perceptions in regard to duration and pitch: the former we interpret in the main quantitatively, the latter qualitatively. Recognizing to what extent the longer values predominated, Boulez split up the duration elements in his *Structure Ib*, combining the series arrangement with a second articulation based on Messiaen's technique of rhythmic cells. This was a useful procedure, since it reduced the over-emphasis of the

long values.

All the same, I asked myself why there should be a duration series at all, when its elements are in any case split up to such an extent that the serial arrangement is no longer discernible in the structure of the piece. Could one not start out with a structural basis of a different type – one that allowed the rhythmic structure to emerge directly from the basic order without the complication of a *second* order cancelling out the first? That brought me to the idea of setting up a *repertory* of duration elements in place of a fixed duration series.

The prototype for a repertory of this sort might be the letter-case used by printers when setting by hand. One compartment of this case contains a certain number of the letter 'a', the second the letter 'b', and so on. Each letter of the alphabet is represented, but not in equal numbers; there are more examples of 'a' and 'e' than there are of 'k' and 'm', for instance, and again more of these than of 'x' and 'z'. That is to say, the letters that occur most frequently in the written language are more fully represented in their compartments than those occurring less frequently. In the first movement of *Apparitions* the repertory of duration elements is laid out in a manner similar to a letter-case: the 'compartment' of the shortest duration values contains the largest number of 'letters'; in the final 'compartment', containing the longest value, there is only a single 'letter'. The rhythmic language of this music consequently makes more frequent use of the short values than of the long ones: in my conception of the overall form I had the idea of a static and rhythmically balanced shape, balance in this case meaning that neither long nor short elements should predominate.

Of course, the apportionment of duration elements according to a frequency constant is valid only for this one piece. For other pieces with different rhythmic characteristics it would have been possible to plan completely different methods of apportionment. (I did in fact make use of this repertory principle in the electronic piece *Artikulation*, but in that piece the product of duration value and frequency was not a constant.)

The letter-case system fulfilled yet another purpose. In it were contained the elements, their numbers and their apportionment, but what was not predetermined was the method of linking these elements together. Thus I was free to make use of a syntactic system independent of the repertory. The drawback of a series is that it determines in advance both the elements and the

means of linking them together, whereas the repertory principle allows for a division into two separate working phases: selection of elements *and* setting up of a syntax.

It would go too far to maintain that this is always an advantage: for instance, the repertory system would be inadequate for musical patterns that are a-syntactic. Rather one might say that the repertory system and the musical syntax it enabled me to employ were, as far as my compositional intentions were concerned, more fruitful than an adherence to strict serial thinking would have been – at least, during one particular working period in the latter part of the 1950s. In later pieces, from about 1960 onwards, I made further modifications in the method described here, working less and less with a predetermined repertory of elements, but rather with predetermined syntactic systems or with linked networks (particularly in and following my orchestral piece *Atmosphères*). Because of this, the first working phase (the selection of elements) has become of decreasing relevance, while what was originally the second phase, the setting up of a musical syntax, has taken over the main role.

*Q.* In connection with the first movement of *Apparitions* you spoke of balance. Is this an ideal to be pursued in relation to form?

*A.* Not at all. Balanced, or static forms are only *one* among many other forms in which I have composed. To the static type belong the orchestral pieces *Atmosphères* and *Lontano*, to mention only the most characteristic examples. Equilibrium, the apparent suspension of the formal process, 'extended time' – these qualities are applied in a more consequent manner in these pieces than in *Apparitions* (although I regard the first movement of *Apparitions* as the key piece, since this movement marked my change of style).

But I have also worked with dynamic, restless, fragmented forms, as for example in *Aventures*, *Nouvelles Aventures* and in the third movement of the Requiem. If the form of *Atmosphères* can be said to be characterized by musical *states* (in contrast to my earlier music, which consisted mainly of *occurrences*), in works such as *Aventures* a number of contrasted musical states are superimposed on or interlocked with each other. The music is not 'occurrent' in these pieces either, but its static nature is cancelled out by the method of interlocking its various states. The changes of state occur as a rule abruptly: one of the commonest expression marks in these particular scores is 'stop suddenly, as if

broken off'.

*Q.* Are the two categories of form – static (situational) and split (interlocked) – to be seen as extremes, or can there be a synthesis between them?

*A.* The two categories are indeed mutually exclusive, but not in all respects. The fact that compositions such as *Aventures* are based on 'states', though these are of short duration and are continually giving way to other 'states', establishes a certain relationship between the two types. Thus the question of synthesis does not arise, for the static form is already contained within the split (or interlocked) one.

However, I have worked with yet further types of form. For example, the type labelled 'like a precision mechanism' is characterized by a specific rhythmical configuration: a state is represented in terms, not of a 'smooth', but of a 'fine-ground' continuity, so that the music is seen as if through a number of superimposed lattices. Compositions of this type include the piece for harpsichord *Continuum*, the third movement of the Second String Quartet and the third movement of the Chamber Concerto. The earliest example of this 'lattice' music is my *Poème symphonique* for 100 metronomes (1962).

In addition to these, there is the 'kaleidoscopic' type. In compositions in this category the elements are separate and contrasted musical shapes, which together make up a kind of repertory, on lines similar to the 'letter-case' principle. Here, however, the 'elements' are not pure ones, since they have already been moulded into shapes. In the composition they are combined each time in different ways, exactly like the particles of a kaleidoscope, that always retain their own identity, but, when shuffled, produce different patterns. My *Ten Pieces for Wind Quintet* are based entirely on this kaleidoscopic principle, and I have used it too in the Second String Quartet and in the Chamber Concerto though in these pieces it is obscured by other types, such as the static and interlocked forms.

*Q.* Is a variety of different methods being employed in the compositional technique as well as in the course of working out the composition as a whole?

*A.* The methods vary from piece to piece, as I have already indicated, and also by degrees: experiences with one piece lead to modifications in technique in the next, and each new piece raises further questions of a technical nature that are dealt with in ensuing pieces, these leading in turn to further questions.

I spoke, in connection with the first movement of *Apparitions*, about the repertory principle and the linking technique, both of which are extensions of the serial idea. In the second movement of this same work, however, I made no further use of a repertory of duration values, nor indeed did I use a repertory of elements of any kind. All the same, the repertory principle was just as valid for the second movement as for the first, with the difference that this time it was not the elements themselves, but the deployment of these elements that was organized according to a repertory or 'letter-case' system. In place of letters, the case contained schemata for links and types of motion.

To put it more clearly: the 'letters' used in the construction of the first movement were contained within the compartments of the letter-case, but the rules for linking them together lay outside it. In the construction of the second movement, the rules for linking were themselves inside the letter-case, while outside was a syntactic system of a higher order, determining in which way the links would be deployed. The principle of *linking links together* made possible the evolvment of that closely woven musical network which is characteristic of the second movement of *Apparitions*. For translation into perceptible music this imaginary and abstract constructional network called for a web of actual instrumental sounds, and so it was necessary to divide up the score into a large number of individual parts, though, as far as hearing them was concerned, these individual parts were completely submerged in the overall texture.

Such was the origin of 'inaudible' polyphony, or *micro-polyphony*, in which each single part, though imperceptible by itself, contributes to the character of the polyphonic network as a whole. In other words, the individual parts and the musical configurations arising from these parts remain subliminal, but each part and each configuration is, in relation to the overall structure, transparent in the sense that all changes in detail lead to changes, however slight, in the total effect.

In the next piece I composed, *Atmosphères*, I made further extensions of micro-polyphony: the network became even more refined, the remnants of independent rhythmic shapes were eliminated, and micro-polyphony was used to bring about gradual transformations of timbre and texture. It is true that in subsequent pieces composed during the '60s I made modifications in my method of working with micro-polyphony, but on the whole I stayed loyal to the conception. In my works from about 1966

onwards I began to thin out the dense polyphonic network: for example, in the second movement of the Cello Concerto, and even more radically in the works after 1968. The individual parts were still more or less subliminal, but now and again there emerged musical shapes at a level of the individually perceptible. Typical of this thinned-out micro-polyphony – now resembling the transparency of a drawing rather than the opaqueness of a painting – are the Second String Quartet (composed 1968) and the Chamber Concerto for thirteen players (composed 1969–70). One might say that the micro-polyphony of these pieces has become less 'micro', the musical texture being balanced on the threshold between imperceptible musical factors and others which are perceptible as shapes.

I had the feeling that I was remaining true to micro-polyphony, however much I had been modifying it. But with the mounting number of modifications there did come a point at which these modifications began to assume more weight than the original condition itself.

In my orchestral piece of Summer 1971, *Melodien*, the polyphony is no longer 'micro', yet the texture of this piece does not suggest a reversion to earlier techniques. It can rather be seen as the logical outcome of micro-polyphony, though containing no micro-polyphonic movement in the literal sense of the word. The situation is similar to that which prevailed after the abandonment of serial music. Series no longer existed, yet nonetheless post-serial music bore within itself traces of experiences gained in working with serial techniques. It was not a retreat to a previous phase, but an advance towards a new style and a new structural concept. My musical position following the abandonment of micro-polyphony is similar: there pass through my mind inter-linked parts of a melodic character, a polyphonic network in which not all the individual parts are submerged. On the contrary, the melodically shaped parts retain their individuality, they move simultaneously at varying speeds and possess a melodic and rhythmic line of their own, varying from and independent of the other parts. In this way melodic shape, that forbidden fruit of modern music, can to some extent be restored.

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*Translation from German by Geoffrey Skelton*