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When is an Orchestra not an Orchestra?

Abstract. The orchestra is a medium in a constant state of evolution. From the classical period through to the modern symphony orchestra, the advent of new instruments such as the clarinet in the 1800s, through to extensions of instrumental families, the contrabass/E flat clarinet, bass oboe, bass trumpet, soprano trombone and cimbasso, Wagner tubas, saxophones, significant extensions of the percussion section, and additions of various keyboard instruments, all had an impact on the concepts of orchestration and orchestral colour from Beethoven through to Stravinsky, Debussy and Ligeti.

Further, from the mid-20th Century, the standard orchestra was frequently reinvented to accommodate new forms and compositional techniques. In *Gruppen* (1955–1957), Karlheinz Stockhausen divided an orchestra of 109 musicians into three "orchestras" (requiring three conductors), to accommodate the temporal structure of its 174 formal units. Similarly in *Mixtur* (1964) the orchestra was divided into four spatially separated timbral groups, to articulate *moment* form. In 1976 Elliott Carter wrote the *Symphony of Three Orchestras* to map out a complex network of interlocking materials on different temporal levels, and more recently, Brian Ferneyhough's *Plötzlichkeit* (2006), partitioned the orchestra into 111 sub-groups, changing every few bars, as a pre-compositional structure, to explore aspects of linear discontinuity.

The cultural and social status of the orchestra, as a cultural icon, has also lead to new conceptual approaches, from a different perspective, aimed to undermine and subvert the conventional notion of the orchestra. Helmut Lachenmann challenged the politics of musical production and inherited notions of what is beautiful, reinventing the orchestral palette. Richard Barrett, in relation to his work *No* (2004), describes the orchestra as "one of the most conservative of cultural institutions", and speaks of composing "against" rather than "for" the orchestra, thinking more in terms of "the meaningful participation of musically-engaged people in a large group". Perhaps some of the more unusual manifestations would be the Scratch Orchestra, formed in 1969 by the composer Cornelius Cardew, which contained no standard musical instruments at all, and defined as "a large number of enthusiasts pooling their resources and assembling for action". Further the Nublu Orchestra, influenced by Butch Morris's techniques of conduction, has little or no notated material, but does use a conductor to control structured improvisations. The technique also gave rise to similar orchestras, such as the London Improvisers Orchestra.

This paper will examine some of these developments and changes in orchestral design in the context of new compositional techniques, and how in some cases socio-political views have also lead to challenge the concept of writing for the orchestra.

Keywords: formal structure, moment form, notation, orchestration, pan-intervallic music, serialism, tempo, Richard Barrett, Elliott Carter, Brian Ferneyhough, Karlheinz Stockhausen.

When is an orchestra not an orchestra? My title is intended to reference various developments in orchestral writing throughout the 20th–21st Century, where aspects of compositional language, ranging from new approaches to orchestral layout as a result of specific compositional strategies, to the nature of the radical material itself, have resulted in reinventing the format of the traditional orchestra.

The conventional orchestra has always been in a state of flux, defined to some degree by musical periods. We speak of the "classical" orchestra comprising double wind, 2 horns and 2 trumpets and strings, for example, to which Beethoven added 2 more horns, trombones, plus instruments such as the piccolo, contrabassoon and un-tuned percussion in the sixth and ninth symphonies respectively. By the end of the 19th century, the standard (Romantic) orchestra was very large, triple wind and brass, 4–8 horns, tuba, harp, double sized string section, and a range of tuned and un-tuned percussion. The modern orchestra is even more extensive, including various saxes, extensions to instrumental families and auxiliary instruments, such as the bass/contrabass and E flat clarinet, alto/bass flute, bass trumpet, electric guitar, bass guitar, various keyboard instruments, ondes-martenot, cimbalom, didgeridoo and so on.

In the latter half of the 20th Century some composers also started to question the cultural status of the orchestra, as an icon of bourgeois society. In the UK in 1969 the socialist/Marxist composer Cornelius Cardew founded the Scratch Orchestra,[1] which was defined as "a large number of enthusiasts pooling their resources (not primarily material resources) and assembling for action (music-making, performance, edification)" (Cardew 1969). The philosophy behind it was that anyone could join in, with an emphasis on improvisation and graphic scores. This has resonance with Richard Barrett's view of the orchestra, which I will come to later, as the "meaningful participation of musically-engaged people in a large group" (Barrett 2005). Lachenmann further questioned the notions of beauty in music, introducing the concept of *musique concrète instrumentale,* which employs a radically new sound world based around extended playing techniques. Music in which "the sound events are chosen and organized so that the manner in which they are generated is at

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[1]   See Cardew (ed.) (1972).

least as important as the resultant acoustic qualities themselves. Consequently those qualities, such as timbre, volume, etc., do not produce sounds for their own sake, but describe or denote the concrete situation: listening, you hear the conditions under which a sound- or noise-action is carried out, you hear what materials and energies are involved and what resistance is encountered" (Lachenmann, in Coleman 2008). There are also orchestras based purely around improvisation, which use conduction, the technique introduced by Butch Morris for structured improvisation, such as the Nublu Orchestra, and the London Improvisers Orchestra[2].

There are clearly many examples we could consider. However, I decided to limit my main discussion here to works by four composers, Karlheinz Stockhausen, Elliott Carter, Richard Barrett and Brian Ferneyhough, which seem to share certain similarities, albeit from very different perspectives. As outlined in many comprehensive books on orchestration there is a more or less standardised approach to writing for orchestra, which has similarly evolved in relation to stylistic elements of instrumental texture and sonority. We might consider works by Stravinsky, the Second Viennese School, Ravel and Debussy, for example; and composers often have a very distinctive voice through their subtleties of orchestration. However, in this paper I would like to consider how the orchestra has been reinvented, informed by new compositional techniques and formal structures. There are many factors to take into consideration, aspects of notational strategies, such as Morton Feldman's *Intersection 1* (1952) for large orchestra, or Earle Brown's *Available Forms II* (1962)[3] for two orchestras; John Cage's number pieces, in which instruments/groups have individual parts defined by time brackets.
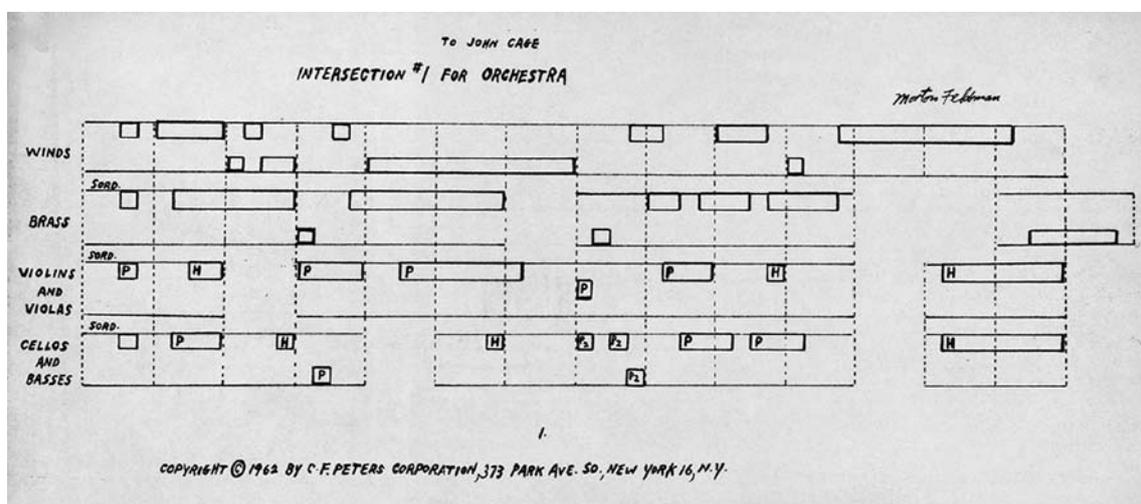

Figure 1. Morton Feldman's *Intersection I* (1952) for large orchestra

Intersection I, for example, is one of Feldman's early so-called "graphic" or box scores, which in this case divides the orchestra into the usual grouping of wind, brass, and strings (high/low) with no further attempt at orchestration other than register; even dynamics are left to the individual player, which, of course impacts on orchestral texture. When we consider the developments of spectral music, the subtleties of orchestration in relation to register and dynamic profiles becomes a very significant aspect of the timbral sound world.

Similarly, Earle Brown's *Available Forms II* is scored for 98 musicians divided into two orchestras (with two conductors) and uses this characteristic mobile form structures, with a wide range of indeterminate notations, which can be combined in multiple ways during performance, leaving only relative control over the orchestration and orchestral texture on the composer's part, although there are very detailed performance instructions for both conductors. We could also hardly discuss contemporary orchestral writing without mention of Ligeti's use of micro-polyphony in *Atmosphères* (1961), which focuses on dense sound textures, rather than a conventional sense of orchestral function.

The works I have chosen, however, all divide the orchestra into subgroups for specific compositional reasons, either related to the temporal structure, the redesign of the orchestral layout, and/or the functionality of material.

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[2]   See The London Improvisers Orchestra. Accessed 20 July 2019, http://www.londonimprovisersorchestra.co.uk/; and Nublu. Accessed 20 July 2019, http://www.nublu.net/.

[3]   Brown, Earle (1962). *Available Forms II*. Associated Music Publishers Inc.

Karlheinz Stockhausen. *Gruppen* (1955–1957)

As the first example, I would like to consider in more detail the seminal 20th century work, *Gruppen für Drei Orchester* (1955–1957) by Karlheinz Stockhausen.[4]

Stockhausen was commissioned to write an orchestral piece by the WDR, Köln. Initially this was to have been a work for large orchestra and three-channel tape, an idea, which for various reasons was dropped. However in 1956 Stockhausen did complete a work for large orchestra, which explored some of the metric principles developed around the same time in *Zeitmasze* (1955–1956)[5] for wind quintet, which included a multi-layered "chromatic scale" of 12 tempi. Although the metric intricacies of *Zeitmasze,* worked well for a small ensemble, where there is close interaction between the players, there were many impracticalities in terms of execution, when transferred to larger forces. In 1957 therefore, the composer rewrote the work for three orchestral groups requiring three conductors. At this time Stockhausen had also been significantly preoccupied with electronic music and was simultaneously working on the substantial tape piece *Gesang der Jünglinge* (1955–1956), a composition, which further lead the composer to explore both spatial possibilities – the work is projected through 5 loud speakers – and a multi-layered structure. The experience of analysing and constructing sounds through electronic media gave Stockhausen very specific insights into the structure of complex sounds and/or noise in relation to time and space, as outlined in his now seminal essay *…how time passes…* (Stockhausen 1959).

As the title suggests *Gruppen* (Groups) marks the climax point of the composer's preoccupation with "group" composition, initially explored in the *Klavierstücke I–IV* (1952) (Stockhausen, Maconie 1989). The composer himself commented on how the notion of groups in *Gruppen* transcends the basic concept of group composition in a similar way to the transformation from points to groups in *Kontra-Punkte* (Stockhausen, Maconie 1989). Stockhausen's early music marks a transition from *punktuelle* composition (*Kreuzspiel/Kontra-Punkte/Punkte*), to groups (*Klavierstücke I–V/Gruppen*) to moment form (*Momente*, *Mixtur*, *Mikrophonie I+II*) as each formal aspect took on a new perspective and functionality; such transitions could be defined by the functional density of information of any particular structural element. In *punktuelle* music, for example, a certain saturation of information leads to a different kind of functional perception of the parameters, as global events, rather than a characteristic individual focus, giving rise to the concept of a group. Stockhausen then defined groups both in terms of procedure and perception (Maconie 1990). On a procedural level a group is a serially defined complex of parametric information, whose relationships might unfold throughout a work, in contrast to a more localised pointillistic aesthetic. Perceptually this has quite a different function in relation to the density of events, texture, noise and polyphony, and, therefore, its formal function.

The overall orchestral make up of *Gruppen* is very large: 5543/2 saxs /8661/12 percussion, 2 harps, electric guitar and stings (26/0/18/12/6). This then is divided into three separate ensembles, which are spatially separated left, centre and right of the audience. *Gruppen* is a highly complex work in terms of its serial organisation. The basic series, for example, is an all interval series:

Figure 2. *Gruppen* all interval series

As can be seen the series divides into two hexachords; each includes a complete segment of the chromatic scale, separated by a tritone, and the second hexachord is a transposed retrograde of the first. The inherent structures here determine many aspects of the work's organisation, even including the order and length and tempo of the groups themselves. However, we only have time to consider the more salient points relating to the orchestration and temporal distribution in detail here, which also derive from this series. The work has a mosaic-like structure divided into 174 formal units (groups) each with its own tempo marking and associated orchestra(s). These groups are at times isolated and at others overlapped. Stockhausen organised the plan for the entire structure which he later published in the following originally multi-coloured *Zeitstruktur* (time-structure) in the CD recording.

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4   Stockhausen, Karlheinz (1955–1957). *Gruppen für Drei Orchester,* No. 6. Universal Edition.
5   Stockhausen, Karlheinz (1955–1956). *Zeitmasze* for wind quintet, No. 5. Universal Edition.

Figure 3. *Gruppen* Zeitstruktur (time structure)

As can been seen, this reflects the composer's concern with serial unity in relation to the various parameters. The scale of tempi, for example, is logarithmically calculated to correspond to the 12 notes of the chromatic scale, allowing for temporal serial organisation. This was more practically rounded off in the score and always given as quarter note values. It will be noted that the first and last tempi are twice the value (60–120) making them equal to an octave in terms of pitch, which would be twice the frequency (A_4 = 440 hz, A_5 = 880 hz), effectively creating a "chromatic scale" of tempi, the initial sequence, of which, is determined by the pitch distribution of the series.

Logarithmic series of tempi

60 63.5 67.4 71.4 75.6 80.1 84.9 89.9 95.2 100.9 106.9 113.3 120

Tempi associated with the chromatic scale

Tempo	60	63.5	67	71	75.5	80	85	90	95	101	107	113.5	120
Pitch	G	G#	A	Bb	B	C	C#	D	Eb	E	F	F#	G

Initial ordering defined by series

Tempo	120	95	63.5	107	101	113.5	80	71	75.5	90	67	85
Pitch	G	Eb	Ab	F	E	F#	C	Bb	B	D	A	C#

Figure 4. Tempi of Stockhausen's *Gruppen*

A further feature of this design is the use of rhythmic durations of half or twice the value (whole note, half note, quarter note, sixteenth note), which can then be considered as octave transposition equivalents. It can be seen in the *Zeitstruktur* that higher pitches correspond to smaller note values and the lower pitches to longer values as basic units. Octave placement of pitches, therefore, significantly impacts on the temporal nature of the material. Further Stockhausen also expressed the intervallic relations as proportions (10:8 3:4 12:5 4:6 etc.) defined by the overtone series[6] (see the line "Proport." on the *Zeitstruktur*), which were subsequently used to determine the duration, and simultaneity of the groups.[7] Compare Figure 4 with the initial pages of the score (Fig. 5).
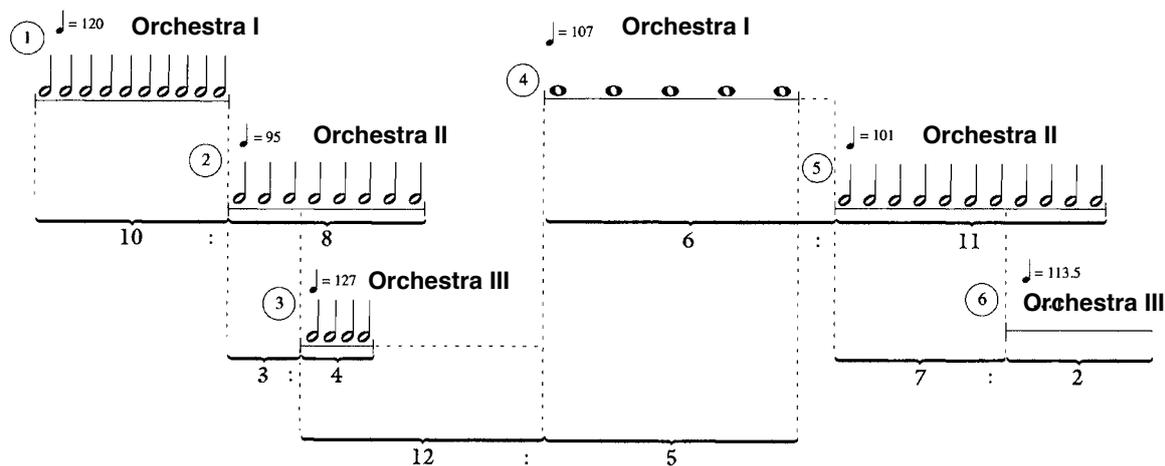
Figure 5. Time plan of Stockhausen's *Gruppen*

Interestingly, a significant feature of the work is that Stockhausen interrupted the original four-part structure with three *eincshübe* (inserts), which completely bypass the serially pre-determined system. These inserts are freely composed allowing for structures that could not be generated by the serial system.[8] They are scored for the all three orchestras as one, and feature temporal transitions (*accelerandi/decelerandi*) between extremes of tempi, MM 60–120–240.

Karlheinz Stockhausen. *Mixtur* (1964)

Stockhausen's next work for full orchestra was *Mixtur* (1964)[9] for orchestra, 4 sine-wave generators, and 4 ring modulators and is an example of moment form. This had been explored extensively in the work *Momente* (1962) for solo soprano, 4 choir groups and 12 instruments. *Mixtur* was initially scored for a large ring modulated orchestra, which Stockhausen eventually revised for a smaller chamber sized orchestra in 1967.[10] In this work the orchestra is divided into five timbral groups, which are once again spatially separated with the addition of the live electronic element. As with the Feldman discussed earlier, the groups are defined by the common orchestral families: Wind (*Holz*), Brass (*Blech*), Percussion (*Sch*), Pizzicato (*Pizz*) and Arco (*S*) Strings, in various combinations and each with its own sine wave generator and ring modulator.[11]

Moment form is a mobile, or polyvalent, form where the order of sections can be changed according to certain rules, and fixed before performance. *Mixtur* consists of 20 such formal units, which can be played from beginning to end or in reverse order (known as the "forwards" and "backwards" versions). It can be seen from Figure 6 that each *moment* also has a name, which relates to the character of the material, and a specific density in relation to the combination of groups.

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[6]   For a discussion of this see Stockhausen (1959).

[7]   For detailed explanation of this see Stockhausen (1959) and Misch (1998).

[8]   For an excellent discussion of the serial organization see Misch (1998).

[9]   Stockhausen, Karlheinz (1964). *Mixtur* for or orchestra, 4 sine-wave generators, and 4 ring modulators, No. 16. Universal Edition.

[10]   Stockhausen subsequently further revised the work in 2003 removing much of the rather beautiful indeterminate notation (variable form) and the mobility of the *moments*, making it a fixed form work.

[11]   The *H, B, Sch, S, P* correspond to the German designations in the score: Holz, Blech, Schlagzeug, Streicher, Pizzicato/Arco.

Moment	Name	Change with	Ensemble	Density	Duration	Dynamic
1	*Mixture*	5	W/B/P/S	4	12 (2)	*f*
2	*Percussion*		Perc	1	30 (5)	*f*
3	*Blocks*	15	W/P/S	3	78 (13)	
4	*Direction*		Perc/P	2	48 (8)	*mf*
5	*Exchange*	1	W/B/P/S	4	18 (3)	*f*
6	*Quiet*		B/S	2	78 (13)	*ppp*
7	*Vertical*		Perc/P/S	3	12 (2)	*f ff*
8	*Strings*		S	1	18 (3)	*f*
9	*Points*		W/B/S	3	78 (13)	
10	*Woodwind*		W	1	12 (2)	*pp ff*
11	*Mirror*	16	W/B/P/S	4	18 (3)	
12	*Translation*		W/P	2	30 (5)	*pp f*
13	*Tutti*		Perc/W/B/P/S	5	48 (8)	*ff*
14	*Brass*	5	B	1	48 (8)	*pp*
15	*A=440*	3/20	W/P/S	3	30 (5)	*pp*
16	*Steps*	11	W/B/P/S	4	78 (13)	*mf*
17	*Dialogue*		Perc/B	2	12 (2)	
18	*Layers*		B/P/S	3	18 (3)	*p*
19	*Pizzicato*		P	1	30 (5)	
20	*High C*	15	W/S	2	18 (3)	*pp f*

(W=Woodwind, B=Brass, S=Arco Strings, P=Pizzicato Strings, Perc.= Percussion)

Figure 6. Moment structure of Stockhausen's *Mixtur*. Shaded *moments* can be interchanged

The durations of each *moment* are based on the Fibonacci series (2, 3, 5, 8, 13 shown in brackets in the example) multiplied by 6 (12, 18, 30, 48, 78). In addition, some *moments* can be exchanged: 1 with 5, 11 with 16, 15 with either 3 or 20 and *moments* 14 and 15 may be played simultaneously in place of 5.

When we consider the possible reasons for this they relate specifically to the timbral nature of the *moments*: 1 and 5 are made up of all 4 groups, without percussion, and 11 and 16 are the remaining 2 *moments*, which use all 4 groups (there are 4 such groups in total); 15 is wind, pizz and arco strings, which can be exchanged with 3 (wind, pizz and arco strings) or 20 (wind and arco strings). *Moments* 14 (brass) and 15 (wind, pizz/arco strings) maybe played simultaneously to make an ensemble of all 4, in place of 5, which is scored for all 4. In cases where the *moments* can be interchanged with contrasting durations, the durations are extended or shortened appropriately through tempi.

Elliot Carter. *A Symphony of Three Orchestras* (1976)

Another work, which divides the orchestra into three, from a very different compositional perspective to *Gruppen*, is *A Symphony of Three Orchestras* (1976)[12] by Elliott Carter (1908–2012). The work is scored for a fairly standard large orchestra of 3333 5331, timps, piano and 3 percussion, divided into three smaller ensembles with distinctive timbral groupings, all of which include strings:

Orchestra I
3 horns, 3 trumpets, 2 trombones, bass trombone, tuba, 5 timpani,
and strings (violins, violas, cellos, and basses)

Orchestra II
E flat clarinet, B flat clarinet, bass clarinet, piano, 2 percussion (mainly tuned),
and strings (violins, cellos, and basses) – no violas!

Orchestra III
2 flutes, piccolo, 2 oboes, cor anglais, 2 bassoons, contrabassoon, 2 horns, 1 percussion (untuned),
and strings (violins, violas, and basses) – no cellos!

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12   Carter, Elliott (1976). *A Symphony of Three Orchestras*. Associated Music Publishers Inc.

Orchestra II is placed in the middle and has a *quasi-concertante* role where the instruments are often featured as soloists, and orchestras I and III are interchangeable on either side at the discretion of the conductor.

Unlike the serial structure of Stockhausen's *Gruppen*, *A Symphony of Three Orchestras* makes use of Carter's characteristic pan-intervallic music, where the material of each orchestra is defined by the use of a specific and individual set of intervals associated with a tempo marking and expressive character. In comparison, it's interesting to note that Stockhausen also used an all interval series. Each orchestra has four movements (as with a classical symphony) with a distinctive harmonic structure, expressive character, timbre and tempo as follows:

Orchestra 1: brass, timpani and strings				
Movement	Interval	Speed	Chord	Character
I	Minor 6th	MM 12		Sostenuto
II	Aug 4th	MM 60		Molto Espr.
III	Major 2nd	MM 420		Flowing
IV	Minor 2nd/9th	MM 120/140		Angry

Orchestra 2: clarinets, perc., piano and strings				
Movement	Interval	Speed	Chord	Character
I	Perfect 5th	MM 45		Bell-like
II	Minor 7th	MM 240		Grazioso
III	Aug 4th	MM 80		Cantabile, espr.
IV	Minor 3rd	Accel to 540		Accelerating

Orchestra 3: flutes, oboes, bassoons, horns, strings and percussion				
Movement	Interval	Speed	Chord	Character
I	Major 7th	360		Giocoso
II	Major 3rd	24		Sostenuto
III	Perfect 4th	180		Flutter tongue/trem.
IV	Major 6th	105		Espr. cantablile

Figure 7. Movement structure of Elliott Carter's *A Symphony of Three Orchestras*

A feature of Carter's music from the 1970s is the multi-layered tempi and musical strata, most thoroughly explored in the Third String Quartet (1971). However, the tempi here are not expressed as individual metronome marks (as with *Gruppen*), but are calculated in relation to a common tempo for all three orchestras and expressed as rhythmic values or pulses, requiring, therefore, only one conductor. The speed indications shown in Figure 7, therefore, represent the speed of impulses and not metronome marks *per se*.

After a 39 bar introduction, each of the movements is heard twice, but the sequence is different in each orchestra to avoid the reoccurrence of any combination. However, the actual distribution of the movements in time is more complex in terms of simultaneities as seen in Figure 8.

Orchestra	Movement order							
I	Ia	IIa	IIIa	IVa	IIIb	IIb	Ib	IVb
II	Ia	IIa	Ib	IIIa	IVa	IIIb	IIb	IVb
III	Ia	IIa	IIIa	IVa	IIb	IIIb	IVb	Ib

(Orchestra II is the one exception where the second appearance of movement I comes before all four movements have been introduced.)

Figure 8. Order of the movements of *A Symphony of Three Orchestras*

Given that each orchestra has its own timbral and harmonic identity, there is a constantly changing orchestral texture, defined by the different layers and temporal activity. At times all three orchestras are combined (though never unified in terms of material) and at others there are various combinations of two orchestras with occasional windows of just one. Figure 9 shows the distribution of the movements from the bars 38 to 180.

Figure 9. Distribution of the movements (bars 38–180) of *A Symphony of Three Orchestras*

Richard Barrett. *Vanity* (1990–1994)

I would like at this point to turn our attention to the work of the British composer Richard Barrett (b. 1959), who has written four very interesting orchestral pieces. His view of the orchestra, however, is rather different. The works we have examined so far have structural reasons for the divisions of the orchestra, which came about through specific aspects of musical language and grammar. Barrett has spoken of the orchestra

as the "most conservative of institutions" and of composing "against" rather than "for" the orchestra. Barrett's music is always to some degree politically engaged, which is reflected in his approach, where he sees the orchestra as the "meaningful participation of musically-engaged people in a large group" (Barrett 2005).

His first orchestral work *Vanity* was written between 1990–1994 and is scored for large orchestral forces of 3333/2 Sax/6032/6 Perc/Pno (2 players)/2 Elec Bass Guitars and strings (24.0.9.9.6). It is divided into three main parts entitled *Sensorium*, *Memento* and *Residua* and for our purposes here, I would like to focus on the first section *Sensorium*. *Vanity* seeks to explore the distance between the extremes of the orchestra seen as an instrument, a global entity, and at the opposite extreme, as an ensemble of 83 instruments. Barrett has said, "I was initially interested in bridging with some kind of formally-significant 'scale', a scale between soloistic and massed behaviours" (Barrett 1995–1996). To achieve this, he initially divided the orchestra into six sub-groups incrementally increasing in terms of the numbers of players by 2, 3, 4, 5 and 6 to form 5, 7, 10, 14, 19 and 25 players respectively. Each group then has certain specific characteristics and expands outwards from a central note F in "ways 'idiomatic' to the constitution of each" to a "characteristic register and registral bandwidth" (ibid.). Further, groups I–V have certain characteristics in common: a solo instrument, an instrument not represented in any other group and a percussionist.

Richard Barrett *Vanity* Orchestral Sub-groups			
Group	Soloist	Ensemble	No of players
I	violin	17 tutti violins, 6 contrabasses, percussion	25
II	oboe	6 horns, 6 cellos, percussion	14
III	trombone	oboe d'amore, english horn, clarinets in Eb and Bb, bass clarinet, 3 violas, percussion	10
IV	cimbalom	2 contrabassoons, 2 trombones, 2 tubas, percussion	7
V	bassoon	Soprano/alto saxophones, 6 violins, 6 violas and 3 cellos (all muted), percussion	19
VI		piano duo, 2 electric bass guitars, percussion	5

Figure 10. Richard Barrett's *Vanity* orchestral subgroups

Not dissimilar to the Carter's, each of these groups has what the composer calls a "composition" consisting of six sections, which are further subdivided into 1, 2, 3, 4, 5 and 6 subsections, exponentially expanding in length, making a total of 21, defined by specific timbral and harmonic materials and in the same order for each group:

1	2		3			4				5					6					
A1	B1	A2	C1	A3	B2	D1	B3	A4	C2	E1	C3	A5	B4	D2	F1	D3	B5	A6	C4	E2
1	2	1	3	1	2	4	2	1	3	5	3	1	2	4	6	4	2	1	3	5

Lower row of numbers represents the positions of the materials in each subsection.

Figure 11. Sub-sections of Barrett's *Vanity*.
Lower row of numbers represents the positions of the materials in each subsection

However, these sections unfold in a rather more complex way, defined by a six-phase structure, where the number of subsections is permutated differently for each group, until the 6th and final section where they all coincide, giving a constant registral frame. *Sensorium* moves through six phases, consisting of the six sections, with increasing durations to a greater or lesser extent resulting in a change from superimposition of the sections to succession. This means the groups gradually "disengage" from one another, which transforms the orchestral texture from a "dense agglomeration of simpler subtextures to a more transparent sequence of more

complex ones" (ibid.). The composer states that the behaviour of each group "must not only adapt to different harmonic/registral contexts, but must also be capable of various instances of superimposition while remaining perceptible, even under conditions of great disparities of dynamic, so there is really no distinction between the techniques of orchestration" (ibid.).

The exception to this principle is group VI, which cuts across the six-phase structure in various ways: the proportions and point of entry appear to be more random than the process of expansion exhibited by the other groups; the harmonic organization is different, and serially based (though not in any conventional sense), using an all interval series unfolding from F; the group directly starts to influence the material of other the other groups, obscuring there functionality and bringing them into focus as a unity.

Figure 12 shows the opening of the work with the entry of groups I–V.

Figure 12. Richard Barrett's *Vanity* entry of groups I–IV

Brian Ferneyhough. *Plötzlichkeit* (2006)

Brian Ferneyhough might not be the most immediate composer to spring to mind when considering orchestral music. His dense parametric layering of material would seem not to lend itself easily to such large-scale forces. However, it is precisely for this reason that his approach to orchestral writing is of interest here. There are only two works for full-scale symphony orchestra, *La Terre est un homme* (1979) for 101 players and *Plötzlichkeit* (2006), which came some 27 years later, leaving aside the works for large ensembles, such a *Transit* (1972–1975), *Firecycle Beta* (1969–1971), *Chronos-Aion* (2007–2008) and *Inconjunctions* (2014).

As always with Ferneyhough there is a work specific reason for divisions of the orchestra informed by compositional concerns. There is never a simple matter of writing an "orchestral piece" in the conventional sense of approaches to orchestration. Already in *La Terre est un homme* the orchestra was divided into timbral subgroups as kinds of "super instruments", which are "at once timbrally integral but structurally discrete" (Fitch 2013). Again similar to the Carter and Barrett works discussed Ferneyhough refers to "several compositions coexisting simultaneously" (Ferneyhough 1995).

Plötzlichkeit is scored for 3333 646 strings, 2 harps, piano, and 3 percussion players, which is expanded by the unusual additions of 3 high female voices, bass trumpet, 2 soprano trombones and cimbasso. The instrumentation is further defined by a three layered stratification of pitch material, where each layer is distinguished by a restriction to a clearly audible timbral identity; the six horns and three trumpets are tuned in sixth tones; the woodwinds and trombones predominantly quarter-tone material, and the strings remain in the usual tempered chromatic scale (Ferneyhough 2006).

The title means "suddenness" which reflects the formal principal of the work that of change from one formal fragment to another. The work is divided into 111 such fragments based on a predefined book of rhythms, harmonic progressions and instrumental combinations, including a 20-layer rhythmic structure based on prolational patterns (Meyer 2007). Each fragment has a change of tempo, instrumentation and density of material.

Section	1	2	3	4	5	6	7	8	9	10	11	12	13
Bars	4 1	1	4	1	2	1	1	3	1	1	3	1	3 1
Tempo	53	59	47	acc	55	acc	65	55	63	53	47	63R	47

14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
4	5	2	2	3	2	1	3	3	2	2	4	2	2	2
57	57	63	55	53	43	63	51	55	51	65	53	53	R	43

29	30	31	32	33	34	35	36	37	38	39	40	41
1	1	1	2	3	1	3	3	2	2	3	1	3
53	59	43	51	55	63	71	64R	63	47	47	59	51

42 Insert: Brass (34)				43	44	45	46	47	48	49	50	51	52	53
6	4	13	11	3	2	1	3	3	2	1	1	2	4	1
55	R51	55	53	53	mm	40	51	63	57	57	53	63	55	51

54	55	56	57	58	59	60	61	62	63	64 (Insert Strings 35)					
1	2	3	2	2	2	3	1	1	1	5	8	6	7	3	6
51	51	51	53	47	55	55	47	51	63	71	55	47	51	40	51

65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
1	2	1	1	1	3	1	1	2	2	1	1	2	2	1
53	R	51	51	51	59	51	acc	55	63	59	65	59	63	51

80	81	82	83	84	85	86	87	88	89 (Insert: wind 33)						
3	1	2	1	1	1	1	1	4	13	2	5	4	2	2	5
47	40	71	53	59	63	77	36	43	55	53	59R	55	63	53	50

90	91	92	93	94	95	96	97	98	99	100	101	102	103	104
1	1	2	1	1	1	1	1	1	2	1	2	1	1	1
50	55	63	67	47	53	53	53	71	51	43	55	55	51	47

105	106	107	108	109	110	111
1	1	2	1	2	2	1
71	36	77	53	47	47	36

Figure 13. Structure of the formal fragments of *Plötzlichkeit* (*acc/R* = *accel* and *rit* respectively, mm = metric modulation)

The fragments are then joined by what the composer refers to as "border states": silence, sudden change with no break and "coloured silence".[13] Ferneyhough writes: "By unfolding in more than a hundred locally defined musical units, the form (anti-form?) of *Plötzlichkeit* is necessarily based on immediate change rather than gradual transformation", describing how the challenge was "to compose short segments of music in which a specific material identity, however it was ultimately to be defined, would combine with a duration somewhere below the threshold of consciousness, whereby the ear would take on the further connotations of the material" (Ferneyhough 2006).

The instrumentation, in terms of the number of instruments playing in any particular fragment was established in advance, before other aspects of the material. However, similar to Stockhausen's *Gruppen* (acknowledged by the composer)[14] the overall process of the work is interrupted by three extended interventions each featuring a constant instrumentation: brass, strings and woodwind. These interventions are approximately the same length (33, 35 and 33 bars respectively) with an incremental number of sub sections defined by tempo changes 4 sections, 6 sections and 7 sections respectively. Ferneyhough comments that he "imagined the arbitrary (and perhaps naive) intervention of these inserts as representing 'defects' or 'mistakes' in the seamless flow, which, at a higher level, would lead to an important undermining of the monolithic impression that results from consequent inconsistency" (Ferneyhough 2006).

Conclusion

In this brief study of five works for orchestra we have seen how compositional concerns lead to the redesign of the conventional orchestra both in terms of orchestration and at times orchestral layout. The temporal structure of Stockhausen's *Gruppen,* for reasons of practicality, lead to three orchestras with three conductors exploring the complexities of group composition; *Mixtur* further divided the orchestra into discrete, spatially separated timbral groups to accommodate the features of *moment* form. Elliott Carter extended his complex pan-intervallic and poly-temporal approach to articulate music for three orchestras, as a division of the conventional large orchestra, and Richard Barrett challenged the concept of the orchestra as a unity, thinking more in terms of a large ensemble crossing the boundary between soloistic and massed behaviours. Finally Brian Ferneyhough radically rethought the functionality of material moving away from a gradual transformation to locally defined units based on a sudden change of orchestration, further defined by timbral identities.

These five works cover a period of some 50 years from the mid-20th century to the early 21st and illustrate how the traditional orchestral format has been reinvented, informed by specific compositional approaches, from the complexities of serial thought, extended to include large scale temporal structures and instrumental groups, to new aspects of the functionality of material as it unfolds or is combined to create new kinds of structure and orchestral sonorities. There was not time in this paper to discuss the music of Helmut Lachenmann or the Spectral school of composition, as just two more such examples of music, which similarly expands orchestral sonorities defined by new instrumental techniques and harmonic sound-worlds, which by their very nature necessarily redefine aspects of orchestration. What does it mean to write for orchestra today? Traditional approaches to orchestration have been challenged to accommodate alternative developments in compositional thought, which demand a rethinking of the orchestra on many levels.

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13   Coloured silence was a principle already explored in the Second String Quartet (1979/80) defined by low dynamic sustained sounds, or *glissandi* with no specific harmonic definition which are used to link more gestural surface events.

14   Email to the author, 11 November 2019.

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Kada orkestras jau nebe orkestras?

Santrauka

Straipsnyje nagrinėjamos per pastaruosius 50 metų sukurtų penkių kūrinių orkestrui kompozicinės struktūros. Jos rodo naują senas tradicijas turinčio orkestro formato traktavimą, padiktuotą specifinės komponavimo filosofijos. Matyti, kaip per pastaruosius keliasdešimt metų kompozicinės evoliucijos kontekste kito pats orkestro konceptas.

Karlheinzo Stockhauseno *Grupėse* eksploatuojamos sudėtingos serijinės struktūros, muzikinės formos trukmės masteliais išplėstos iki aspektų, artikuliuojančių ir plėtojančių komponavimo grupėmis principą; o to paties kompozitoriaus kūrinyje *Mixtur* orkestras padalijamas į penkias tembrines grupes, kuriomis operuojama taikant momentinės formos principus. Elliotto Carterio Simfonijoje trims orkestrams standartinis didelis orkestras padalijamas į tris mažesnius. Panintervalinių ir daugialaikių struktūrų technikomis žymima ir kombinuojama skirtinga kiekvieno orkestro medžiaga. Richardas Barrettas ir Brianas Ferneyhough orkestrą padalijo į pogrupius, kad ištyrinėtų įvairios medžiagos funkcionalumą ir jos santykį su kūrinio formodara.

Ši analizė atskleidžia neįtikėtiną skirtingų kūrinių kompozicinių struktūrų giminingumą, nors tie kūriniai sukurti žvelgiant iš nevienodų teorinių perspektyvų.