Rhythmic Structure in Stravinsky's "Le Sacre du printemps"

2020 Preface

The following thesis was written in 1970 as part of the requirements for an MA in musicology from the University of Pittsburgh. It is now 50 years old. Nevertheless, it contains information and ideas that will probably be new to most readers.

Were I to write this today, it would be somewhat different (probably excluding some instances of youthful exuberance), but, in essence, I stand behind the basic analyses of the work. I would use the word "dimension" instead of "parameter," and there are a few other changes in structure and style that I would probably make. Still, I believe that this paper contains a more rational and historically-based approach than other analyses of "*Le Sacre*," particularly those of Boulez, with which the bulk of the paper makes contrasting arguments. For those who don't read French, the explanations I've made of Boulez's analyses should suffice. Both the French original and English translations of "Relevés d'apprenti" can be found online, and citations of the location of the English translations of the French quotations used are in the footnotes of the paper.

There are, perhaps, a few historical question marks to be made, such as the almost-standard belief that the original performance of "*Le Sacre du printemps*" by the Ballet Russes caused a mêlée to the degree often cited. In actuality, all of Diaghilev's scheduled performances took place, and some scholars today believe that people, perhaps even Stravinsky himself, may have later exaggerated the reality of the audience's behavior at the premiere in order to make the event more of a cause célèbre. (See <<u>https://notanothermusichistorycliche.blogspot.com/2018/06/did-stravinskys-rite-of-spring-incite.html></u>)

Finally, I apologize for the poor physical nature of this download. The original paper was, of course, typewritten, with most of the illustrations being hand-written or (poorly because of the technology of the times) photocopied and pasted into the paper; this makes any OCR conversion essentially impossible. The original version of the paper is in the University of Pittsburgh Music Library. What I have is merely a copy of a copy, and so I have had to scan the paper from an already inferior source. Even so, I think that the paper is still readable and I hope that some will find it of interest and value.

Barry Schrader

RHYTHMIC STRUCTURE IN STRAVINSKY'S

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LE SACRE DU PRINTEMPS

Barry Schrader

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If most of what has been written about Stravinsky's <u>Le Sacre du</u> <u>Printemps</u> is to be believed, the work's chief importance lies in the fact that its first performance caused a riot. Books and record jackets are full of information on what took place on May 29, 1913, at the Theatre des Champs Elysees. Little, however, has actually been written about the music itself, and most of what has consists of generalizations which are so broad that they are useless in trying to analyze the music.

The importance of <u>Le Sacre</u> does not lie in only one or two aspects of the music. Every parameter of the work is important to the whole. An acceptable analysis of the composition must, therefore, take into consideration as many aspects of the music as is feasible. In so doing, a complete analysis of even one section of <u>Le Sacre</u> could easily fill several volumes. This is not to say, however, that it is not possible or valuable to separate one aspect of <u>Le Sacre</u> from the rest of the music, and to analyze this one parameter in order to discover what are its important features. Of all the elements of <u>Le Sacre</u>, rhythm is the one which is most often discussed, and seems the least understood. Stravinsky's use of rhythm in <u>Le Sacre</u> is obviously one of the work's most important features; however, the way in which Stravinsky has created the rhythmic structures found in <u>Le Sacre</u> has only been guessed at, or roughly analyzed.

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In analyzing the rhythmic structures found in <u>Le Sacre</u>, it is necessary, as far as is possible, to ignore all of the other parameters of the music, including rhythmic function. Such structural analysis is, of course, to some extent an artificial or forced situation. Indeed, it is impossible to cause the rhythmic structures of <u>Le Sacre</u> to separate itself from the rest of the music by applying one or two magic analytical formulae. Admittedly, the process of isolating one musical parameter and analyzing it for its own sake is a touch-and-go process. It is valuable only if the final analysis works well enough to say something relevant about the composer's compositional methods.

The only major analytical work which has been done on <u>Le Sacre</u> to date is by Pierre Boulez. In the second section of his <u>Relevés d'Apprenti</u>,¹ Boulez discusses several sections of <u>Le Sacre</u> in some detail. Boulez deals with other factors besides rhythmic construction. Harmonic and melodic construction, as well as rhythmic function, are often analyzed by Boulez simultaneously. It is important the the present discussion concerns itself with Boulez's analysis for two reasons. Since its publication, Boulez's analysis of <u>Le Sacre</u> has been considered by most author-

^{1.} Pierre Boulez, <u>Relevés d'Apprenti</u>, ed. by Paule Thevenin (Paris: Editions du Seuil, 1966). The English translation of this book is <u>Notes of an Apprenticeship</u>, trans. by Herbert Weinstock (New York: Alfred A. Knopf, 1968). Citations for both French and English versions will be given in the footnotes. The letters "F" and "E" will be used before a citation in order to distinguish the French version from the English version.

ities as the best available analysis. The analyses of sections of <u>Le Sacre</u> which are presented here, however, differ with those by Boulez. Boulez's analysis will therefore be taken into account where it is possible, so that his results may be compared to the present findings and criticized accordingly. In seeing where Boulez may have erred in his analytical work, it may also be possible to understand why the rhythmic structure of <u>Le Sacre</u> has not been better comprehended. Since only the analysis of the rhythmic structure of <u>Le Sacre</u> is presently under consideration, the other aspects of Boulez's analysis will not be taken into account, unless they intrude on what is properly rhythmic territory.

The following analyses of the rhythmic structure in <u>Le Sacre</u> can safely draw on only two sources: the revised score of 1921,² which is the version most often played, and Stravinsky's sketches for <u>Le Sacre</u>,³ which have recently been published. By using these sources, it will be shown that there is one basic controlling principle regarding rhythmic construction in <u>Le Sacre</u>: rhythmic construction by the process of addition.

2. Igor Stravinsky, <u>Le Sacre du Printemps</u> (New York: E. F. Kalmus, n.d.).

3. Igor Stravinsky, <u>The Rite of Spring; Sketches 1911-1913</u>: <u>Facsimile</u> <u>reproduction from the Autographs</u> (London: Boosey & Hawkes, 1969).

In considering rhythmic construction by the process of addition,

it is necessary to distinguish between the durational and the rhythmic units or cells that Stravinsky uses. Durational units may consist of a single durational note value, or of a single note value with one or more, rest values. These durational units are usually of fixed value, and do not vary throughout entire sections. At times, however, the units themselves may be internally variable, but they remain constant in relation to each other. (Only the use of fixed durational values will be discussed at present; the workings of variable units will be taken up later.) These durational units are then combined into short rhythmic cells which in turn may also be fixed or variable. The short rhythmic cells are then added or linked together to produce the longer rhythmic phrases. An analysis of the B section of the <u>Danse sacrale</u>, No. 149 to No. 154 in the score, will demonstrate how Stravinsky constructs rhythmic phrases by using this kind of linear addition.⁴

It is at once seen that only two fixed durational units are ever

4. The overall structure of the <u>Danse sacrale</u> is that of a rondo. It may be divided into its constituent parts as follows: A-No. 142 to No. 149 (measures 1 through 33); B-No. 149 to No. 167 (measures 34 through 115); A-No. 167 to No. 174 (measures 116 through 148); C-No. 174 to No. 186 (measures 149 through 202); A'-No. 186 to end (measures 203 through 275).

١I

used in the rhythmic ostinato of this section. These two units are $\int 7$ and $\int 77$, which are durationally equal to an eighth value and a quarter value, respectively. The horns can be seen playing $\neg 7$ and $\neg 77$, which are, in effect, the same durational units that the other instruments have. The basis for discerning these units is a simple one. The units consist of a sounded note and the rest value between it and the next note. It does not seem possible to consider that Stravinsky is working here only with one unit of the sounding note value $\int 7$, even though no other note duration is used, and that he then proceeds to intersperse rests between note values. The patterns $\int 77$ and $\int 77$ are not fabricated; they exist in the work. Their consistent use is quite evident. For purpose of analysis, it is practical to consider these fixed durational units as longs and shorts. Thus $\int 77$ is a short or S, and $\int 777$ is a long or L.

following scheme results:⁵

SLL SSL LLS LSS LLS LLL LSL LLL SSL

LSL

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Admittedly, this is not a convincing justification for assuming such an analytical procedure. Before continuing, therefore, it is necessary to consider the general structure of this entire section.

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The B section of the <u>Danse sacrale</u> is in three parts with a coda. The first part is found from No. 149, measure 34 of the <u>Danse sacrale</u>, to two measures before No. 153, measure 54. At this point a definite articulation occurs, caused by the upward lines in the flutes and violins, and the marked figure in the timpani. It will be noted that this articulation is the cadential result or depository for a melodic figure which began in measure 47. At measure 55 the music returns to the same texture as the beginning of the B section. Measure 55 is, therefore, the beginning of the second part of this section. This second part continues to build by

^{5.} Cellular structure in Le Sacre is not necessarily reflected in phrasing or other musical gestures. For example, the short durational unit in the cell LLS may be heard as connecting to the first durational unit of the next cell, thereby creating a phrase which is not defined by cellular structure.

textual and melodic additions until a climax and articulation are reached in measure 92. Measure 93 begins a third part of the B section, which continues through measure 106. The coda, which is marked by a new upper ostinato figure in the flutes and first violins, goes from No. 165, measure 107, through measure 115, after which the A section returns. This part is best described as a coda since a melodic figure found in the 1.1 • 1 · · · . other three parts is not used here, and the texture is much thicker, and . 5. the instrumentation is expanded. Thus there are four distinct parts to the B section of the <u>Danse sacrale</u> which have been shown to exist by virtue of the very nature of the music. With this in mind, it is possible to return to the consideration of the linear rhythmic ostinato, and its construction.

A complete analysis of the rhythmic groups in the B section of the <u>Danse sacrale</u> results in the following chart:

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Part I measure 34	Part II measure 55	Part III measure 93	Part IV (coda) measure 107
1 SLL	1 SLL	l SLL	1 SLL
2 SSL	2 SSL	2 SSL	2 SSL
3 LLS	6 LSL	1 SLL	3 LLS
4 LSS	5 LLL	3 LLS	3 LLS
3 LLS	6 L.SL	5 LLL .	(SS)
5 LLL	5 LLL	4 LSS	
6 LSL	4 LSS	3 LLS	
5 LLL	5 LLL		
2. SSL	7 SSS		 Line and the Schwarz strengthenergy in the second strength in the second stren
6 LSL	6 LSL		
	· · 2 SSL	• .	
	6 LSL		
	1 SLL		
	7 SSS		
	4 LSS		
	2 SSL		
	4 LSS		
	3 LLS		
	(SSS)		
	(5555)		

The arabic numerals to the left of the rhythmic units identify a particular configuration as it chronologically appears in the music. Thus group 1 is SLL, group 2 is SSL, and so forth. Several things may be noted from this chart. Group 1 always occurs at the beginning of each of the four parts of the B section, and group 1, in this position, is always followed by group 2. This does not happen at any other point. It must be assumed, then, that group 1 followed by group 2 is used as an opening rhythmic phrase for each part. No case needs to be made for dividing the B section into four parts solely on the grounds of this analysis. The divisions have been made by using more audible aspects of the music. The appearance

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of this particular grouping at beginnings of each part not only justifies these divisions, but also demonstrates the validity of these rhythmic cells.

The possibility for variation in groupings of three using only two factors is 2 cubed or eight. Stravinsky, however, uses only seven of the possible formations. The possible SLS formation never occurs. Group 7, SSS, is used only in the second part, which is rather different from any of the other three parts of the B section. The groups enclosed in parentheses are so marked because they are deviations from the scheme. The series of shorts from part two occurs at the climax of the B section, at measures 91 and 92. They are considered as shorts because they have the same durational value as other shorts, if not the exact unit pattern. The two shorts at the end of the coda occur in measure 115. Both these points are cadential. There is no reason why Stravinsky, having developed a constructional rhythmic scheme, should not deviate from it at places such as these for special purposes. Even if this is not granted, the evidence presented seems too strong to suppose mere coincidence.

In the sketches for <u>Le Sacre</u>, Stravinsky seems to have little trouble in working out the B section of the <u>Danse sacrale</u>. This section makes its first appearance on page eighty-four of the sketches. Although there are only five measures of the music written here, the two durational units, as well as a five note thematic unit, already exist in their basic

forms. Pages ninety through ninety-five contain most of the music for the B section similar to its appearance in the printed score. The two durational units remain constant, and the ostinato is written out only in the horn parts after the first measure. After this, the abbreviation "etc." appears to signify that the other parts playing the rhythmic ostinato should continue as do the horns.

The B section of the <u>Danse sacrale</u> demonstrates how Stravinsky constructs rhythmic phrases by adding units together. The two durational units are added to each other in groups of three. These rhythmic cells are then added or joined together to form longer rhythmic phrases. With the exception of the beginnings of the four parts of this section, where groups 1 and 2 occur in that order, it does not seem to be important how the groups are added together. Almost any combination would work as well as the one Stravinsky arrived at. The important decisions were made on the construction of the basic units.

Boulez's analysis of the B section of the <u>Danse sacrale</u> seems overly complicated.⁶ He divides this section into six periods which are derived according to a change in the harmonic construct " ... un thème uniquement rythmique sans accentuation, où les périods s'organisent sur un seul accord."⁷ It would follow, from this concept, that each of these

6. Boulez, <u>op. cit</u>., F. pp. 95-98; E. pp. 93-96.

7. <u>Ibid.</u>, F. p. 95; E. pp. 93-94.

six periods would be based on only one harmonic construct. However, periods three and six, in Boulez's analysis, contain more than one harmonic construct. Boulez rationalizes this inconsistency by claiming that period three modulates on three chords,⁸ and that the chord in period six is based on "un accord brodé."⁹ The six periods are as follows:

^	PERIOD	<u>MEASUR</u> 34-62	<u>ES</u>
	and a second	63-75	بالمراجع فيجفيه فنجي فسام يحجه الألحا المعر
	III	76-82	
	IV	83-90	(measures 91 and 92 are omitted from period analysis)
	V	93-106	
	VI	107-115	

Only periods five and six occur where the music naturally articulates itself. Boulez feels he must exclude measures 91 and 92 from his fourth period. "Suit une élimination régulière de sept croches successives amenant une seconde partie dans le développement rythmique."¹⁰ The placement of periods one through four seems as impractical as the implementation of the rule for forming each of the periods.

Boulez makes a more serious error when he regards the barlines, as printed in the published score, as distinct lines of division, over which rhythmic units cannot pass. Stravinsky's final placement of bar-

8. <u>Ibid</u>., F. p. 97; E. p. 95.
 9. <u>Ibid</u>., F. p. 98; E. p. 96.
 10. <u>Ibid</u>., F. p. 98; E. p. 95.

lines and the final meter signatures may be the result of nothing other than concern for ease of reading. In the sketches Stravinsky uses a system of barring which is very different from that of the final score.¹¹ The actual music and its rhythmic structure, however, are almost identical to the finished version. Therefore, the placement of barlines, phrase markings, or the method of beaming can in no way delineate basic rhythmic groups. Boulez's rhythmic groups are the result, nevertheless, of barline placement. Boulez never states how many bars equal a particular group in a given case, or why the groups should exist in this manner. Thus, a certain group may be two measures long at one point, but only one measure long at another point. All the various groups, however, fit rather neatly into the modern barline scheme of the music.

Boulez never concerns himself with basic durational units. They are either assumed or ignored. His rhythmic cells (or perhaps it is better to say metric groups, since they never cross barlines) are rather variable, and their identification is loosely defined. Boulez defines three types of groupings. His "a" cell is based on a mixture of eighth and quarter values, where an eighth note may precede or follow a quarter note, but two eighth values must never be found successively. Quarter values, however, can follow each other. Furthermore, each "a" cell may consist of either three or five eighth values. The first group in the B section is

11. Stravinsky, <u>Sketches</u>, pp. 90-95.

analyzed as $\int \int \int$ and is termed as $a\overline{5}$. The arrow denotes that this cell is in prime position. It may also occur in retrograde, $a\overline{5}$, as $\int \int f$. There is also an $a\overline{3}$ cell which is $\int \int$, and its retrograde $a\overline{3}$, $\int f$. The "a" group, besides having two different values, three or five, and being able to exist in prime or retrograde form, may also be transformed into $\int f f$ which is simply marked as $a\overline{5}$, without the use of any arrow, lest confusion ensue.



Boulez explains this analysis in the following passage:

Nous voyons tout d'abord que les cellules composantes sont de même famille deux à deux, b4 c4 valeurs paires (quartre croches) a3 a5 valeurs impaires (trois et cinq croches), c4 étant de nature neutre puisqu'il ne peut pas se rétrograder, b4 et a3 étant rétrogradables, a5 pouvant tantôt être neutre, tantôt se rétrograder, conjuguant ainsi les trois autres cellules. Nous éstablissons la schéma:

12. Boulez, op. cit., F. p. 96; E. p. 93.



Nous remarquons que la période II est la permutation des cellules a5 et b4 de I, a5 devenant neutre-avec adjonction de a3. Le fragment III est une permutation de II (en diagonale) avec a3 agrandi de part et d'autre par sa rétrogradation. Enfin le fragment IV est un retour à la disposition du fragment II.

Boulez's analysis is too complicated to be convincing. His division of the B section into six rhythmic periods is illogical, since it is based solely on harmony, an entirely different parameter than rhythm. His use of barlines for cell divisions has no real foundation, nor does it work well. Boulez has, in effect, eight different metric groups, not three. Even if his three types of cells are assumed to actually exist, the extremely variable nature of the "a" and "b" groups make their use as actual working units very doubtful. Furthermore, his fragmentation of periods can be ascribed to nothing more than coincidental and somewhat forced observation. The analysis previously presented on pages four through ten, while perhaps not as fascinating, and certainly not as

13. Ibid., F. pp. 95-97; E. p. 94.

complex as Boulez's analysis, follows more realistic concepts.

* * *

In the B section of the <u>Danse sacrale</u>, Stravinsky combines basic durational units into rhythmic cells, which are then added together to form longer rhythmic phrases. Sometimes Stravinsky skips the middle step in this process of construction by addition, and combines durational units into longer rhythmic phrases which are then repeated. In the <u>Evocation des Ancêtres</u>, No. 121 to No. 129 in the score, Stravinsky follows this simpler procedure. The two durational units that are used in this section are the quarter note and the half note. They will be referred to as short and long respectively. In this section there are three different rhythmic phrases. These phrases are articulated in two manners: a phrase ends when a long occurs, or a phrase is over when a rest is introduced. Sometimes phrases are also articulated by the short downward passage in the lower instruments. This is the same figure which opens this section.

Phrase 1 is variable, and is heard three times: measures 4 through 8, measures 27 through 31, and measures 37 through 39. The first appearance of phrase 1 is juiced to a long to a long: appearance, the last note of this phrase has been changed to a long: LSSSSSL SSSL. The final presentation of phrase 1 is an elided form, which may be called 1': LSSSL. Phrase 1 is the only phrase which begins with a long. Phrase 2 consists of six shorts. This phrase is always articulated by a rest. Phrase 3 is constructed of eight shorts and one long. An analysis of this section in the above manner results in the following chart:

and Andreastante andreastante	REHEARSAL NO.	<u>MEASURE</u>	PHRASE	ANALYSIS	
	121	1	1	LSSSSSL SSSS	
n an	122	10	2	SSSSS	القوالية الأثيرين الألياصية الجا
· · ·	123	15	2	SSSSSS	
		17	3	SSSSSSSSL	
		20	2	SSSSSS	
	124	23	2	SSSSSS	••
	125	27	1	LSSSSSL SSSL	
•	126	32	3	SSSSSSSSL	
		34	2	SSSSSS	
	127	37	1.	LSSSL	
		40	2	SSSSSS	· ·

Even though phrase l is variable, its existence as a specific entity can be derived from its function. Phrase l always starts with a long and has the characteristic of beginning after a period of rest. It is these two factors in combination which clearly identify this phrase. This rhythmic phrase, and phrases 2 and 3, which never change their patterns, are added to each other to form this entire section. Here, as in the B section of the <u>Danse sacrale</u>, there is no evidence for what could be termed as developmental rhythm.

Another example of thythmic construction by the process of adding small units to each other may be seen in the second tableau, or the B section, of the Introduction to Part II of Le Sacre at four measures after No. 86, measure 34 of the Introduction. The ostinato figure which begins here in the violas and upper cellos is constructed from three durational units: sixteenth note, quarter note, and dotted quarter note. The sixteenth notes are always placed in a triplet setting $\overline{\mathcal{M}}$, which is followed by one of the longer values. Thus two rhythmic cells may be distinguished: 冊丁 , which may also be written as 冊丁厂 , and $\widehat{\mathbb{H}}$, written as $\widehat{\mathbb{H}}$ or $\widehat{\mathbb{H}}$. These two cells which will be called A $\widehat{\mathcal{T}}$ and B $\widehat{\mathcal{T}}$, are fixed and never change. Thus the total durational value of A is a dotted quarter note, and that of B is a half note. These cells are linked together to form two phrases. The first phrase is found in measure 34 and 35 and may be analyzed as AABBA plus $\widehat{\mathfrak{H}}$. The final triplet figure may be seen as the beginning of a new group which is not completed. The second phrase is much longer, lasting from measure 38 through measure 47. During this phrase the second violins also play this ostinato rhythm. The second phrase is seen as AABBABBABBABBABBABBABBA plus 📆 . Closer examination reveals that this

long continuous second phrase is composed of two shorter phrases: AABBA and BABBA. The former phrase is a repetition of the one presented in measures 34 and 35. The rest of this line consists of three statements of BABBA. Thus the second phrase divides into AABBA/BABBA/BABBA/ BABBA/ $\frac{2}{12}$. The continuing triplet is cut off by the return of previous material at No. 89.

Boulez analyzes this rhythmic ostinato as a repetition of one long pattern which has two parts.

> Dans la cellule B, nous avons l'élement broderie conjointe de sib qui devient une broderie--toujours à distance d'un ton entier--del'accord de dominante appogiaturé placé sur sib . Le rythme en est ordonné par une disposition symétrique des valeurs autour d'une noire liée à une autre noire,

valeurs impaires d'un côte (3 et 3), valeurs paires de l'autre (4 et 4). Cet ordre de valeurs est déplacé par des accents en un parallélisme symétrique.

si; ne

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En effet, la dernière blanche d'une cellule perd une croche par anticipation de la cellule suivante, croche qui se joint donc à la première noire pointée de cette deuxième cellule.

This analysis works to some extent, but it is not practical since Boulez fails to note the real rhythmic cells, which are much shorter than he supposes. He is considering only combined durational value units and the amount of time they occupy. He is not concerned with the way

14. Ibid., F. p. 104; E. pp. 99-100.

in which Stravinsky has joined the basic units to each other, nor does he seem to care how the units are aurally perceived.

The actual process in this section of the Introduction to Part II is similar to the methods used in both the B section of the <u>Danse sacrale</u> and the <u>Evocation</u>. At the same time, this portion of the Introduction to Part II is a procedural extension of the processes found in the previously analyzed sections. The following chart compares the steps taken in the compounding of rhythmic materials in the three sections analyzed.



With the exception of the Evocation, the rhythmic structures

of the sections of <u>Le Sacre</u> which have been analyzed so far are ostinato figures which are constructed from the addition of fixed cells and all of these ostinatos occur as part of polyrhythmic situations. In the <u>Evocation</u> however, a monorhythmic situation exits. Thus, the two possible types of rhythmic construction exist in <u>Le Sacre</u>: 1) monorhythmic construction, in which only one rhythmic scheme is used throughout the entire section; and 2) polyrhythmic construction, in which two or more rhythmic schemes coexist on multiple, simultaneous levels. When Stravinsky invents a monorhythmic situation, all of the various aspects of the music seem to be conceived of as a unity. In fact, the different parameters of the music work so well together that there may be a temptation to perceive one parameter in terms of another.

Perhaps the most outstanding example of monorhythmic construction in <u>Le Sacre</u> is found in the A section of the <u>Danse sacrale</u>, which is first presented from No. 142 to No. 149 in the score, measures 1 through 33 of the <u>Danse sacrale</u>. Here, it may seem difficult to separate the various elements of the music from the rhythmic structure. Indeed, the rhythmic construction may be said to dominate this entire section. In order to understand the rhythmic structure of this section, it is necessary

III

to return to Stravinsky's sketch book for Le Sacre.

The A section of the <u>Danse sacrale</u> first appears in the sketches on page eighty-four. The music here is almost identical to the first six measures of the final version.

It can be seen that at this point of development, the durational units are quarter and eighth values. Stravinsky was to later half all the values, and change the placement of the barlines. In this sketch, the earliest preserved conception of the beginning of the <u>Danse sacrale</u>, three rhythmic cells have occurred to Stravinsky. The first cell, marked by the letter "A", consists of a single note, and is represented as $\int 7$, \int , or $\int 7$. It may seem questionable to refer to a single note as a rhythmic cell; but it must be noted that this cell may be equal in values to either the second or third cells. The first cell is also strikingly set off by its

larger sounded duration. The second cell, shown by the letter "B". consists of two notes, and may be \square , \square , or \square . The third rhythmic cell appears as \mathcal{III} . These cells are determined not by a constant total value, but by the number of attacks in each group. The groups are articulated by a rest, a larger note duration, or an attack of the metrically accented bass note. Actually, the principle of cell construction found here is very simple: a cell consists of one, two, or three notes; If two or three note cells are used, then the notes must be struck one after another in terms of the shorter durational unit. Thus \mathcal{D} and \mathcal{D} do not aurally differ as far as attack pattern is concerned. The grouping $\int f$, however, does differ from the above principle, and therefore, never occurs as a cell in the music. While the cells are fixed according to attack sequence, they may vary in their total durational values. It is this fact which causes this section to sound rhythmically irregular. Although these cells remain constant according to the plan of attack, they undergo a mutation by variation as far as their total duration is concerned. This type of mutation by variation was noted in the analysis of the <u>Evocation</u>, where phrase 1 always appears in a slightly different form (see page sixteen).

In order to consider the final version of the A section of the <u>Danse sacrale</u>, it is necessary to change the basic durational units to eighth and sixteenth values. Cell 1, therefore, becomes $f \neq , f$, or

the following scheme may be observed:

PART	MEASURES	STRUCTURE
I	1-9	222132113
II	10-17	2213222332111
III	18-33	22131222321322232122

3

At the beginning of each of the parts, the rhythmic phrase 2213, as shown in the above analysis, is presented, thus corresponding to the beginning of a new part of the A section of the <u>Danse sacrale</u>. The first 2 cell is introductory in nature, and is set off from the rest of this section by a fermata. The repetition of a rhythmic phrase at the beginning of each part of the A section is the same procedure Stravinsky uses in the B section of the <u>Danse sacrale</u> (see page eight). The phrase 2213 appears at the beginning of each part of the A section, but only at the beginning.

In his analysis of the A section of the <u>Danse sacrale</u>, Grout states that "The rhythm at the beginning of the last movement of the <u>Sacre</u> looks very irregular but sounds orderly; as a matter of fact it is organized rather symmetrically around the motive 7 \longrightarrow which appears eight times . . . "¹⁵ He then gives a diagram which is found on the next page. This is all that Grout seems to find necessary to say about this section of <u>Le Sacre</u>. His discussion is not only cursory, it also introduces concepts which need more clarification than Grout gives them.

His claim that this section is "rather symmetrically" organized around

7 \overrightarrow{m} is not explained. The statement seems backed up by nothing more than the fact that 7 \overrightarrow{m} appears eight times in this section. In effect, Grout seems to be saying that the frequency of appearance of a rhythmic "motive" is a basis for determining the fact that the music is organized around that "motive". If this were the case, then it would seem to follow that the most common "motive" is the organizing factor. In this situation, the cell \overrightarrow{m} should then be the organizing agent since it appears fifteen times, while \overrightarrow{r} \overrightarrow{m} appears only eight times. Grout does not explain what it means to have the music organized around a "motive"; nor does he say how such organization is achieved. It has been demonstrated that the rhythmic structures in this section of <u>Le Sacre</u> (see pages twenty-two to twenty-four), as well as other sections, is organized by a process of addition of cells. It is unclear, then, how the

15. Donald Jay Grout, <u>A History of Western Music</u> (New York: W. W. Norton, 1960), p. 636.

Danse 16 P + 16 P + P + P + P 11 M B 32 11 1 ا د ر در ۵ د در ۵ ۲

rhythm could be organized around a given "motive", without some demonstration.

Grout's chart does not clarify his written analysis; instead it seems to confuse matters even more. The rhythm of the A section is laid out on not one, but two levels. Grout does not say why such an arrangement is necessary. Several plausible reasons may be postulated. It is commonly known that Stravinsky composed Le Sacre at the piano, and this fact is hinted at by the appearance of the A section of the Danse sacrale in the printed score. The left-hand-right-hand appearance of this music may be so important to Grout that he analyzes it accordingly. In this case, a note with a downward stem would indicate the "left-hand" or bottom rhythm, while those notes with an upward stem show the top or "right-hand" rhythm. In this event, Grout's analysis takes on a directional aspect, showing the up and down nature of the music. Such a layout does not demonstrate very much, unless Grout wished to see two levels of rhythmic activity here. But he does not ascribe such property to his diagram, nor does he make any argument for a rhythmic construction on two levels.

Another possible reason for the particular arrangement of this chart might be Grout's consideration of the bass and timpani parts. The lower line of Grout's chart is, for the most part, an outline of the durational values of the attacks of these instruments. In measures 15 and 16,

however, neither the basses nor the timpani play, but Grout's chart shows lower level attacks taking place anyway. Perhaps Grout wants the lower line of his diagram to indicate an ostinato of some sort. There is no metrical ostinato here; the attacks are metrically irregular. Neither is there a pitch ostinato on the note "d," as might be supposed, since in measures 23 and 24 the basses and the timpani change pitch. It does not seem possible to deduce a reason for the layered scheme of Grout's chart. Since Grout does not explain the layout of his diagram, it is impossible to know what it demonstrates.

Actually, Grout does not explain anything about his chart. He does not even say why the horizontal lines of the chart are put in their particular vertical alignment, nor does he explain the purpose of counting eighth note values. The chart is, in some way, evidently supposed to demonstrate how the A section is structured around the rhythmic "motive" $7 \int \mathcal{T}$. Grout probably picked $7 \int \mathcal{T}$ as the organizing figure since a particular melodic motive is always associated with it. This, however, seems unnecessary for rhythmic analysis.

In his chart, Grout attempts to line up the music according to recurring rhythmic and metric patterns. This actually says nothing analytic about the rhythmic structure. It only demonstrates that a chart may be arranged in such a manner that it literally duplicates certain aspects of the music. Grout's analysis of the A section of the <u>Danse sacrale</u> is

worth little. His claims are supported neither by his discussion nor by the music, and his chart reveals nothing that is not immediately evident from looking at the score of <u>Le Sacre</u>.

The entire A section of the Danse sacrale is repeated from No. 167 to No. 174 in the score, measures 116 through 148 of the <u>Danse sacrale</u>. The rhythmic repetition is exact, while the pitches have been lowered a minor second. The end of the <u>Danse sacrale</u>, however, from No. 186 to the finish of the work, has been called A' to denote not only its relationship with but also its difference from the two appearances of the A section. Stravinsky's sketches for the A' section give the clue to its genesis. On page eighty-nine of the sketches, Stravinsky has written out letters above measures of the music. In the appendix to the sketches, on page twenty-four, Craft notes that "here the manuscript testifies to what extent composition was now a matter of shuffling orders of phrases, of repeating or eliminating one or more of the units represented by 'A', 'B', 'C', and 'D'."¹⁶ Craft fails to mention two other units "E" and "F" which also appear on this page. The five units are as follows:

16. Robert Craft, "Commentary to the Sketches," in Igor Stravinsky's <u>The Rite of Spring; Sketches 1911-1913</u>: Facsimile reproduction from the Autographs (London: Boosey & Hawkes, 1969), p. 24.



At this point, Stravinsky himself seems inconsistent about exactly what these units actually are. Are they rhythmic, melodic, harmonic, directional, proportional, or all of these things? None of these units is rhythmically new; all of them occur, as combinations of prime rhythmic cells, in the two appearances of the A section. All of Stravinsky's units may be seen in terms of the original prime rhythmic cells:

> A - 2 plus 3 B - 1 plus 3 C - 2 D - 1 plus 3 E - 3 plus 2 F - 1 plus 3 plus 2

That Stravinsky consciously thought in such terms can be seen on page eighty-five of the sketches. Here the figure $\int_{0}^{r} \int_{0}^{r} \int_{0}^{r} has$ written before it in parentheses "2 + 3".¹⁷ On the same page of the sketches, the figure $\int_{0}^{r} \int_{0}^{r} \int_{0}^{r} h$ is termed a "3 + 2", showing that the attack of the bass note, as stated earlier, may have the function of articulating cells.

What is new in Stravinsky's lettered units is, of course, the pitch content. Rhythmically, "B" and "D" are the same. The "F" unit is rhythmically equal to "B" or "D" plus "C". The direction and pitch content of "F", however, is different from any of the other groups. Why, then, does Stravinsky destroy the letter identity of the group by scratching out the letter "F", and never call for "F" again? Why are there other groups on this page without letters, whose rhythmic pattern is the same as one of the lettered groups, but whose pitch content and direction are

17. The notes with downward stems indicate only the attacks of the timpani. The notes with upward stems indicate the attacks of all other material.

different? Stravinsky seems somewhat inconsistent in his determination and use of the letters and what they stand for. Since it is impossible to tell the exact meanings of Stravinsky's compositional units at this point, and since rhythmic construction is the prime consideration of this inves-

tigation, the groups will be considered only for their rhythmic content.

There are, then, three rhythmic cells, two of which have been

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formed by the addition of primary cells:

EXTENDED CELL	NUMBER OF UNITS	DISPLACEMENT OF PRIME CELLS
A	5	2 plus 3, or 3 plus 2
В	4	l plus 3
C	2	2

An analysis of the A' section in terms of these enlarged or extended rhythmic cells is as follows:

PART I	PART II	PART III
ABCB	AABC	AAC
ABAB	AABC	AAC
CAAB	ABCC	AAC
AAA	ABC	AAC
ABAB	ABC	
ABCB		

These cells are formed into rhythmic phrases, each of which consist of

18. The A' section of the <u>Danse sacrale</u> is, like the A sections, in three parts. These parts may be determined by changes in texture, instrumentation, and melodic patterns. The parts are I) from No. 186 to No. 192, II) from No. 192 to No. 197, and III) from No. 197 to the end. three or four cells. Most of these phrases are repeated, but only within their respective sections. It is unfortunate that an analysis of this section based on Stravinsky's original lettered units is possible only up to a point. There is no question, however, that Stravinsky was thinking in terms of construction by the addition of these groups. At the end of page eighty-eight of the sketches, Stravinsky has written "A B C D E A B D E

The principle of rhythmic construction found in the A and A' sections of the <u>Danse sacrale</u> is the same one that is used in the sections previously analyzed. Two durational units are combined to form three prime rhythmic cells. These rhythmic cells are variable as to their total durational value, but fixed as to the number of attacks in each cell. Thus, they remain constant in relation to each other. Mutation by variation of total durational value does not affect their identity. These prime cells then form larger cells by being added to each other. This process may be seen occuring in the second and third parts of the A sections, but particularly in the A' section. Nevertheless, all parts of all of these sections may be seen in terms of the prime cells. It is certain that Stravinsky's compositional units in this section of the <u>Danse sacrale</u> have much more than just a rhythmic function. They seem to have occurred to Stravinsky at once, with all of their parameters singly defined. The creation of these cells, and the exact way in which Stravinsky considered

them must remain a mystery. It seems clear, however, that rhythmically they are predicated on one, two, or three attacks per group, or combinations of these numbers to make four or five attacks. Stravinsky has rejected other possibilities, as is evidenced by his deleting the letter "F" from a combinational group which he nevertheless uses,

Boulez's analysis of the A section of the Danse sacrale, like

Grout, owes much to the idea that groups have lower and upper parts. Boulez, however, not only uses direction to define his cells, but also aspects of repetition, harmony, and accentuation. It is undeniable that all these things, and many more, are involved in the music. To use these parameters, however, to discern and isolate the rhythmic structure does not seem any more reasonable here than it did in the discussion of Boulez's analysis of the B section of the <u>Danse sacrale</u>. Here is Boulez's analysis.

> Un élément A qui se constitue d'accords répétés servant de préparation a l'élément B, formé de l'accent suivi de sa désinence. Disons que les élements' A et B forment un groupe T. Un groupe C vient, par changement d'accord, équilibrer le groupe T; groupe C qui se compose d'une préparation suivie d'un accent puis se transforme en préparation accent désinence avec une distribution fixe de valeurs: doubles croches pour le préparation, croches pour les accents, doubles croches pour la desinence.... On peut distinguer deux périodes dans le développement de ce rythme (ex. XVII).





Exemple XVII.

 $I \begin{cases} I. - \underbrace{A_3 \ A_5 \ B_7, A_5 \ B_7 \ A_3, ce qui donne}_{\Gamma_{15} \ \Gamma'_{15}} \\ I. - \underbrace{C8, A_4 \ B_7, C_5, A_5 \ A_4 \ B_7 \ A_3}_{\Gamma_{2} \ C_{3} \ C_{5} \ C_{7}} : C8 \ \Gamma_{11} \ C_{5} \ \Gamma'_{19} \\ II \ . - \underbrace{A_5 \ B_4, A_2 \ B_4, A_3 \ A_5 \ B_4, C_5, C_7}_{\Gamma_{9} \ \Gamma_{6} \ \Gamma_{12} \ C_{5} \ C_{7}}$

."

On remarquera que, si A et C varient irrégulièrement, B ne comporte que deux valeurs fixes B7 et B4, la seconde venant comme élision de la première.

Dans la première période, on remarquera la disposition symétrique A3/A5 B7 d'une part, A5 B7/A3 d'autre part.

La deuxième période utilise A4, contraction de l'element A5 apparu dans la premiere periods; et une forme A'5, dérivée de C8.

La troisième période introduit B4, contraction de B7, ainsi que les variantes C5 et C7: elles serviront plus tard au développement terminal.¹⁹

Even if the relevancy of Boulez's criteria for discerning these groups were granted, his final rhythmic analysis is questionable, for it relies very heavily on the total durational count of sixteenth values. The difference, for example, between various A5 and C5 groups is not clear. The very definition of Boulez's B element is vague and unconvincing. This group seems largely identifiable by its beaming scheme and by its melodic motive. Boulez falls into the same traps in his analysis of the A' section.²⁰

Friedrich Petzold, a German scholar, has also analyzed the A section of the <u>Danse sacrale</u>. Petzold's rhythmic analysis of this section is not a rhythmic analysis at all, but rather a consideration of the displacement of the meter signatures.

19. Boulez, <u>op. cit</u>., F. pp. 127-129; E. pp. 125-127.

20. Ibid., F. pp. 134-135; E. pp. 132-135.



Teil A, der das Material stellt und das Verengungsprinzip des rhythmischen Grundstocks beginnt;

Teil B, in dem die Methode des zahnradartigen Verschränkens rhythmischen Gedanken benutzt wird;

Teil C, die rhythmische Coda, ausgeführt mit dem Material des Teils A in der Methode des Teils B.²¹

Petzold's contraction principle, as well as his metrical correspondences, is artificially supported by the specific layout of his chart. In any case, his analysis does not really deal with rhythmic construction.

The A section of the <u>Danse sacrale</u> is an excellent example of rhythmic construction in parametric unity: a monorhythmic situation, in which most aspects of the music coincide with the rhythmic scheme. Because of the difficulty in separating the rhythmic structure from other ele-

21. Friedrich Petzold, "Formbildende Rhythmik zu Strawinskys 'Sacre du Printemps'," <u>Melos</u>, XX (1953), p. 47. ments of the music, past analyses of this section dealt with the rhythmic construction in terms of other parameters of the music as well as with rhythm. These analyses fall short primarily for this reason, and also because of the confusion over the variable yet consistent nature of the rhythmic cells. While a complete analysis of this section of <u>Le Sacre</u> must include all the parameters of musical composition, a rhythmic analysis can, and has been made by contending solely with this one aspect.

Here, as in the other sections of <u>Le Sacre</u> analyzed, the basic principle of rhythmic construction by the process of addition remains valid and workable. The C section of the <u>Danse sacrale</u> provides a good example of polyrhythmic construction, as well as an illustration of cell mutation. This section may be divided into four parts. Each part differs in texture, specific instrumentation, and in the manner the material is presented. Part one goes from No. 174 to one measure after No. 175 in the score, measures 149 through 153 of the <u>Danse sacrale</u>. Part two, which introduces new melodic material and has a larger instrumentation, lasts from measures 164 through measure 159. Part three goes from No. 177 to No. 180, measures 160 through 173. In this part, there is another change of instrumentation, and a new treatment of the melodic material. From No. 180 to to No. 181 there is a brief interjection of the material from the A section, which divides the third and the fourth parts of the C section. Thus, the fourth part goes from No. 181 to No. 186, measures 181 through 202.

The first part of the C section introduces two levels of rhythmic construction simultaneously. The first level is played by the basses, cellos, tuba, trombone, and contra-bassoons. The durational unit is the eighth value, and there are three fixed rhythmic cells: 1) $\int \int 7 \int 7 - 7$; 2) $\int \int 7 \int 7 \int 7$; and 3) $\int \int 7 \int 7 \int 7$. These cells differ from each other only in the total duration of the rests following the sounded notes, and, therefore, in the total durational value of each cell. When these

IV

cells are used to analyze the first rhythmic level of the entire C section, measures 149 through 202, the following results:

	PART	MEASURE	CELL	CONFIGURATION
	I	149	1	<u></u>
99.99 - 200 		a kara kara kara kara kara kara kara ka	. 2 1	<u> </u>
• • • •		an an man Walant, na stragging yang sa	2	<u> </u>
,			ì	$\pi r r r - r$
	ĬĬ	154	3	5757572
			1	515757-
			1	$\pi \pi $
			3	<u> </u>
			3	<u> </u>
			3	<u> </u>
			2	$\Box \int f \tau f \tau$
	ш	160 (2nd beat)	1	$\pi r_7 r_7 -$
			1	<u> </u>
			1	<u> </u>
			1	<u> </u>
			1	<u> 57777</u>
				D r_7

	PART	MEASURE	CELL	CONFIGURATION
	IV	181	1	<u></u>
			1	<u> </u>
			1	55757-
late o productionalit		en land en angeler		<u></u>
			1	<u> </u>
రాజుత్ ఉప్పరా	والمقود المريح الأواحب	a a shi tingi she a se n nga a sang ta ata	ан алын алын 1 х	<u> </u>
			1	<u> </u>
	,		1	<u> </u>
			· 1	<u> 57777-</u>
			2	$\Pi \Gamma 7 \Gamma 7$

A second level of rhythmic activity also begins in the first part of the C section. This level is played, in part one, by the timpani, tamtam, bass drum, and the horns. In the remaining three parts of the C section, the horns do not play this rhythmic level. The basic durational unit here is also the eighth value. In this second rhythmic level, there are two primary cells: a two grouping: \square ; and a three grouping: \square . These form larger fixed rhythmic cells, which are equal, in total durational value, to the cells found in the first rhythmic level. The three extended cells of the second rhythmic level are 1) \square \square \square \square , or 2323; 2) \square \square \square , or 232; and 3) \square \square \square \square , or 2323. If an analysis of the second rhythmic level of the C section is made, and

					· · · · ·
<u>PART</u> I	<u>MEASURE</u> 149	<u>FIRST LEVE</u> <u>CELL</u> 1	L SECON CONFIGURATION CELL	<u>D LEVEL</u> (<u>PRIMARY CELLS</u>) 23233	<u>configuration</u> <u>பர்பர்</u> ப்
		2 1 2 1	$\frac{\Box f f f f f}{\Box f f f f f f} = 1$ $\frac{\Box f f f f f f}{\Box f f f f f f} = 1$ $\frac{\Box f f f f f f}{\Box f f f f f f f} = 1$	232 23233 232 23233	<u>, , , , , , , , , , , , , , , , , , , </u>
II	154	3 1 1 3 3 3 2	$\frac{\int \int r_{7} \int r_{7} + \frac{1}{7} - $	2323 23233 23233 2323 2323 2323 2323 2	<u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>
III	160 (2nd beat)		$\frac{17}{17} \frac{5}{7} \frac{5}{7} \frac{7}{7} \frac{7}{7} \frac{1}{7} \frac{1}{17} \frac{1}{17} \frac{1}{17} \frac{1}{7} \frac{1}{7}$	23233 23233 23233 23233 23233 23233 23	
IV	181	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2	$\frac{J \int 7 \int 7 - 1}{J \int 7 \int 7 - 1}$ $\frac{J \int 7 \int 7 - 1}{J \int 7 \int 7 - 1}$ $\frac{J \int 7 \int 7 - 1}{J \int 7 \int 7 - 1}$ $\frac{J \int 7 \int 7 - 1}{J \int 7 \int 7 - 1}$ $\frac{J \int 7 \int 7 - 1}{J \int 7 \int 7 - 1}$ $\frac{J \int 7 \int 7 - 1}{J \int 7 \int 7 - 1}$ $\frac{J \int 7 \int 7 - 1}{J \int 7 \int 7 - 1}$ $\frac{J \int 7 \int 7 - 1}{J \int 7 \int 7 - 1}$	23233 23233 23233 23233 23233 23233 23233 23233 23233 23233 23233	

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compared with the first rhythmic level, a correlation between the two

levels can be seen.

cells l

sition:

From the above chart, it is evident that these two levels of

rhythmic activity spring from the same source. This can be clearly seen

if the corresponding cells from both levels are considered in superimpo-

ells 1 F f f f f f

cells 3 J J J J, J 而 J 而

The cells from both rhythmic levels run parallel throughout this section. Boulez does not consider these as separate rhythmic levels, but as only one level.²² But it seems clear from Stravinsky's sketches that, as he continued to work on this section, the two levels became distinctly separate entities.²³ It is impossible to deny, primarily because of instrumentation, that each level can be clearly heard separately in performance.²⁴ These two levels of rhythmic activity are also distinguished

22. Boulez, op. cit., F. pp. 129-131; E. pp. 127-129.

23. Stravinsky, Sketches, p. 87, and pp. 99-101.

24. This is especially true of Stravinsky's own recording of Le Sacre on Columbia MS-6319.

in their patterns of accentuation. The first level primarily accents a metrical beat, whereas the second level is continuous, without accentuation or pause.

A third rhythmic level, which governs the melody of this section, begins in the second part at measure 154. The cells of this third rhythmic level undergo a great deal of mutation by variation. In order to discern, the basic cells, and the method of construction of the third rhythmic level, it is necessary to turn to Stravinsky's sketches for <u>Le Sacre</u>.

On page eighty-seven of the sketches, the first extended sketch for the C section of the <u>Danse sacrale</u> appears.²⁵ This sketch is shown on the next page. Here Stravinsky has lettered four units as "A", "B", "C", and "D". These letters refer primarily to the rhythm of the melodic line. Stravinsky has set each unit equal to a number of quarter values: A = JJ = 2J; B = JJJ = 2J; C = JJJ = 3J; and D = JJJ = 2J. The letters A, B, and C will be retained in this discussion in order to refer to the above corresponding rhythmic cells. Since "D" is rhythmically the same as B,²⁶ the letter D will be used to describe a fourth rhythmic cell J JJ, found at the top of page eighty-seven of the sketches. Thus, there are four rhythmic cells in the third rhythmic level of the C

25. Earlier sketches are found on pages 83 and 85.

26. The use of these letters in the sketches may also refer to various alignments of the different rhythmic levels.



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and a state of the later

section. The basic durational units are the eighth and the quarter values.

No passage in the final version of this section of <u>Le Sacre</u> corresponds exactly to the sketch on page eighty-seven of the sketches. The music played by the violins at No. 184 in the score gives the closest parallel. Here the line 1111 111 111 111 111 111 111 111 111

This rhythmic phrase is constructed of the cells in their earliest known form. In the other parts of this section, however, Stravinsky has mutated the rhythmic cells by the variation of their attack patterns. Cell C, for example, may become JJ. The total durational value of each cell, however, remains fixed. This is the reverse of the procedure that Stravinsky uses in the A section of the <u>Danse sacrale</u> (see page twenty-three). In the C section, only cells A and C are varied. Cell B is always JJJ, and cell D is always JJJ.

The third rhythmic level is first presented in the second part of the C section, beginning in measure 154. Here the third level is played by the horns, violins, trumpets, oboes, and clarinets. In order to see the entire rhythmic line of the third level at this point, it is necessary to combine the action of all these instruments into one linear construct. Boulez sees this rhythmic level in terms of imitation, or subject-response construction.²⁷ This may be true melodically at this point of the C section, but it does not seem to be the case rhythmically. The music of the third rhythmic level is aurally perceived as a constant succession of notes. Rhythmic imitation within the third level does occur in part four (see page fifty), but it is noticeable there because the lines follow each other very closely. Boulez seems to be dividing the third rhythmic level of part two into subject and response groups on the basis of instrumentation. But the instrumentation is constantly changing and seems less valid as a reason for dividing lines here than it does in the case of

rhythmic levels one and two. Boulez, however, does not realize any distinction between levels one and two, despite the greater aural evidence. According to Boulez, measures 155 through 157 are constructed

as

Subject A B A C F G GResponse P F H

- A 6 horns, 2 trumpets
- B 6 horns, violins 1 & 2
- C 2 trumpets
- D 6 horns, 4 oboes
- E 2 horns
- F 4 clarinets, violins 1 & 2
- G 4 horns
- H 2 oboes, 4 trumpets

27. Boulez, op. cit., F. pp. 129-133; E. pp. 127-132.

With such an instrumentation will sound as \widehat{J} . The quick changes in instrumentation make these lines impossible to follow as subject and response. Note that rhythmic levels one and two always maintain the same instrumentation in parts two, three, and four. Even if a subject-response situation were granted in the third rhythmic level of part two, Boulez still fails to note the rhythmic cells that Stravinsky uses.

The first note in the horns, at measure 154, is the end of a long "d" pedal, and will not be considered as a part of the third rhythmic level. This level is first presented in part two of section C as $B(\overline{JJJ})$ $C(\overline{JJ})B(\overline{JJJ})D(\overline{JJ})C(\overline{JJJ})B(\overline{JJJ})A(\overline{JJ})$ $D(\overline{JJ})C(\overline{JJJ})B(\overline{JJJ})A(\overline{JJ})$. Cells A, B, and D are immediately recognizeable, since they have not been changed. Cell C, however, has undergone mutation by variation, and now appears as \overline{JJ} and \overline{JJ} . While the attack pattern of cell C has changed, its total durational value of three quarter values remains the same.

In part three of the C section, measures 160 through 174, only cells A, B, and C are used. Cell B remains $\mathcal{M}\mathcal{M}$. Cells A and C, however, have been mutated by having their sounding note values halved. Thus cell A is $\mathcal{F}7\mathcal{F}7$, and cell C is $\mathcal{F}7\mathcal{F}7\mathcal{F}7$. Part three analyzes as C C B A B A A B A B C C, which is a palindrome construction.

In the fourth part of the C section of the Danse sacrale, measures

181 through 202, this third rhythmic level may now be divided into two lines. Boulez's analysis of this section is one of his best.²⁸

and the second second



28. Ibid., F. pp. 131-133; E. pp. 129-132.

29. This chart graphically illustrates Boulez's analysis of the fourth part of the C section. The letter "S" stands for subject, while "R" denotes what Boulez terms the "response." "H" designates an "element harmonique" (sic) which is a constant line of quarter notes. "P" indicates the ostinatos, which are levels 1 and 2 of the C section (see pages thirty-nine through forty-four). The arabic numerals stand for the number of quarter values within Boulez's brackets.

It can be seen that the top two lines in Boulez's chart are in rhythmic imitation. This imitation is readily noticeable since a B cell ($\int \int \int \int$) presented on one level is quickly followed by a B cell on the other level. Line one of the third rhythmic level is the top line of Boulez's chart, and is played by the flutes, oboes, bassoons, violins, and violas from measure 181 to measure 195. (At measure 190 the oboes drop out and the clarinets enter at measure 195. Up to this point the clarinets have been playing the line which consists entirely of steady quarter notes. At measure 195, the oboes take over this job, and the clarinets take the place of the oboes in the top part of the third rhythmic level.) Line two of the third rhythmic level, the second line on Boulez's chart, is played by the trumpets from measure 183 to measure 195, when the horns take over. (The horns have been playing the steady quarter note line up to this point.) The "H" line, as Boulez calls it, consists of a constant reiteration of quarter notes on different pitches, played with a constant fluctuation of instrumentation. Because of its monorhythmic nature, this "H" line blends with either the first or second line of the

Indeed, were it not for the clearly defined B cells, only one rhythmic line would be noticeable.

third rhythmic level. Therefore, only two rhythmic lines may be heard.

Actually, it is possible to see the third rhythmic level of part four of the C section in terms of the previously described rhythmic cells

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of this third rhythmic level.

In the above chart of part four of the C section of the <u>Danse</u> <u>sacrale</u>, measures 181 through 202, both lines of the third rhythmic level, as well as the Q or quarter note line (Boulez's "H" line) can be seen. Cells A and C have, in line I, again undergone some mutation by variation, but they both retain their fixed total durational values. The Q, or quarter note, line may be considered in conjunction with either of the other lines; it does not make any difference as far as aural perception or rhythmic construction. In the chart, for example, lines II and Q have been used in conjunction with each other to form A cells, since the succession of quarter notes continues, even though the trumpets or horns may not be playing.

The C section of the <u>Danse sacrale</u> demonstrates rhythmic construction by addition on multiple simultaneous levels, with both fixed and mutable rhythmic cells. The B section of the Introduction to Part II of <u>Le Sacre</u> shows how Stravinsky creates a polyrhythmic construction using only fixed cells.

There are three levels of thythmic activity in the B section of the Introduction to Part II, No. 86 to No. 89 in the score, measures 31 through 47 of the Introduction. Levels Ia and Ib are played first by the trumpets, and later, after No. 87, by the clarinets and horn. There are

Thus, an analysis of all of level Ia, measures 31 through 47, according to these two rhythmic cells, is ABAAABAABB. Level Ib is so called because it always occurs in conjunction with level Ia, or, as Boulez puts it, as a counterpoint to level Ia. 31. The two fixed rhythmic cells of level Ib are C) []], and D) []]. Level Ib, therefore, analyzes as CDCCCDCCDD, an identical pattern to that of rhythmic level Ia. Rhythmic level IIa has already been analyzed on pages seventeen through nineteen. Its two fixed cells are E) $\widehat{\Pi}$, and F) $\widehat{\Pi}$. This level is played by the second violins, violas, and cellos. Level IIb also has two fixed cells: G))) , and H) J / JJ / Levels IIa and IIb are, like levels Ia and Ib, always played in conjunction with each other. Rhythmic level IIb is played by the lower cellos, and may be analyzed as GHGHGHGHGHGH. Rhythmic level III has only a single , plane of rhythmic activity, whose two fixed cells are I) and J) $\mathcal{F7}$. The piccolo clarinet, flutes, and first violins participate in this level. Thus, level III is constructed as IJIJIJIJ. The entire B section of the Introduction to Part II of Le Sacre may be analyzed according to these three levels of rhythmic activity. Here the principle of

30. This is a rare instance when rhythmic cells do fall within measures.

31. Ibid., F. p. 101; E. p. 99.

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rhythmic construction by the addition of fixed cells can be clearly seen.

ΑB

CD

EEFFE

А

С

GH GH GH

Α

С

EEFFE EEFFE FEFFE FEFFE

B B

DD

ABAA

CDCC

LEVEL

Ia

Ib

IIa

IIb G H	GH GH GH
III J I	l l I l l l
SCORE NO 86 87	88
It is interesting to note that Stravinsky also defin	nes the two cells of
levels Ia and Ib, in conjunction with each other,	as "A" and "B", and
calls for them in his sketches by merely writing	their letter names. ³²
Boulez's analysis of level IIa has already been d	iscussed on pages eigh-
teen and nineteen. His analysis of the entire B	section of the Introduc-
tion to Part II is correct as far as identifying the	various levels of rhyth-
mic activity. However, he fails to note the rhyt	hmic cells, their repeti-
tions, or their combinations into longer repeated	rhythmic phrases, such
as are evident from the above chart. ³³	

32. Stravinsky, Sketches, p. 63.

33. Boulez, op. cit., F. pp. 101-108; E. pp. 99-106.

In a post script to his analysis of <u>Le Sacre</u>, Boulez writes

Peut-être, au fur et à mesure des conclusions que j'ai tirées à la suite des differentes analyses, m'aura-t-on trouvé une certaine tendance a exagérer les rapports arithmétiques, à ne pas tenir compte de l'inconscient. Dois-je répéter ici que je n'ai pas prétendu découvrir un processus créateur, mais me rendre compte du résultat, les rapports arithmétiques étant les seuls tangibles? Si j'ai pu remarquer toutes ces caractéristiques structurelles, c'est qu'elles s'y trouvent, et per m'importe alors si elles ont été mises en oeuvre consciemment ou inconsciemment, et avec quel degré d'acuité dans l'intelligence de la conception, ou encore avec quelles interférences entre le travail et le "genie". Établir une telle genèse du <u>Sacre</u> serait d'un grand intérêt spéculatif, s'écartant toutfois du seul but musical auquel j'ai voulu me limiter.³⁴

Indeed, it is an impossible task to determine the details of the creative processes which produced <u>Le Sacre</u>. But, in the case of <u>Le Sacre</u>, it is possible to see the genesis of certain aspects of the music. Thanks to Stravinsky's sketches for <u>Le Sacre</u>, the early stages of composition can be studied. It is necessary, then, only to assume a logical connection between the material found in the sketches and the final version, and a rational continuation of similar processes in the interim development between the first sketches and the final draft. It must be assumed that Boulez did not have access to the sketches when he analyzed <u>Le Sacre</u> since he never makes any reference to them. This, of course, was a

34. <u>Ibid.</u>, F. p. 142; E. p. 141.

V

distinct disadvantage to Boulez, who feels that he is in no position to speculate on the genesis of any aspect of Le Sacre.

Boulez's claim that he is able to analyze certain structural characteristics of <u>Le Sacre</u> because they are there must be called into question. One of the problems of human nature is that while almost everyone can clearly see the "facts" of a given situation, they continually argue over the interpretation of the data. The structural characteristics of <u>Le Sacre</u> which are produced by Boulez's analysis are there because they are the result of his analysis. This, however, is true of any analysis. There is no question that the structural systems of Boulez's analysis work, but it is doubtful that they work well enough. If it were not for this, and the existence of Stravinsky's sketches for <u>Le Sacre</u>, there might be no reason to question Boulez's analysis, or to consider the rhythmic structures of <u>Le Sacre</u> in terms other than Boulez's.

Boulez's analysis of the rhythmic structures of <u>Le Sacre</u> does not work well enough. It is, for the most part, overly complicated and too variable. Too often, Boulez regards the barline as some sort of inviolable barrier, over which a rhythmic cell or phrase cannot pass. His formation of rhythmic cells or periods is sometimes arrived at by regarding rhythm through another musical parameter, thus denying the rhythmic structure a life of its own. In analyzing certain sections of <u>Le Sacre</u>, Boulez divides the music into sections which are based on his own analy-

sis, in spite of the overwhelming musical evidence for a different construction. At times, Boulez seems to have missed altogether the formation of rhythmic cells, and the creation of rhythmic phrases by the process of adding these cells together. Boulez's analysis of the rhythmic structures in Le Sacre must be said to be incomplete. Perhaps Boulez's analysis, as well as his methods, are more indicative of his own thinking than of Stravinsky's; Boulez's procedures are probably closer to the construction of his own music than that of Le Sacre.

The analyses of the rhythmic structures of <u>Le Sacre</u> which are presented here all follow the general principle of rhythmic construction by the process of addition. Basic durational units are combined to form short rhythmic cells. Mutation of these primary rhythmic cells may occur by variation of either the total durational value of the cells, or the attack pattern. Both aspects of a given cell, however, are never variable at the same time. Sometimes, these short rhythmic cells are added together to form longer rhythmic cells. These expanded rhythmic cells may also be fixed or mutable. The formation of these larger cells is caused by adding primary cells together in various combination, alway, however, in fixed total durational values. Larger cells may also undergo mutation by variation. The next step in this process is the addition of different cells to form short rhythmic phrases. Finally, these phrases are added to each other to form long rhythmic phrases,

resulting in the final audible rhythmic structure. As has been seen, one or more steps in this process of rhythmic construction by addition may be left out in a given instance. This does not alter the basic constructional principle, nor does it change the nature of the final product.

It is impossible to say that Stravinsky consciously followed the step by step procedure just outlined. The sketches prove that Stra-. . . . vinsky composed Le Sacre by combining various cells, many of which he refers to by letter names. The analyses of the sections of <u>Le Sacre</u> which have been presented prove that, beyond any nature of mere coincidence, the rhythmic structures of the work may be seen in terms of cells and the principle of construction by addition. The actual mental steps in the process, then, are not important. The detailed procedure which has been presented is intended only as a plausible, logical approximation of the compositional steps that Stravinsky used. To say, as does Boulez, that it has been possible to perceive this type of rhythmic structure in Le Sacre, along with its principle of construction because it is there, is to say too much. A better justification for the present analysis, and one which is proven in all cases, is that the analysis works, and is consistently comprehensible.

It is clear from the sketches that the cells used by Stravinsky in writing <u>Le Sacre</u> have much more ascribed to them than just rhythmic function. The other parameters of these cells have been ignored as much

as possible in this analysis, since this discussion deals only with rhythmic construction. However, since Stravinsky's compositional units do pertain to several aspects of music simultaneously, and since the process of rhythmic construction by the addition of these cells has now been proven, it is only a short step to the application of this principle of construction to the other parameters contained in these cells. It is most likely that such parameters as melody and harmony may also be in part constructed by the principle of the addition of basic units. In fact, after even a casual look at the sketches for <u>Le Sacre</u>, it is difficult to suppose anything else.

The importance of the rhythmic structures in <u>Le Sacre</u> can hardly be overestimated. <u>Le Sacre</u> is not merely valuable as a sort of rediscovery of rhythm as an independent parameter of music, as Boulez notes;³⁵ nor does its importance lie only in the fact that such handling of rhythm is one of Stravinsky's chief stylistic characteristics. In <u>Le Sacre</u>, it is possible to see rhythm being freed from the autocracy of the barline and the confines of regular meter by the rigorous application of systematic processes. Much of the foundation of the attitude toward rhythm in contemporary music was laid by Stravinsky in <u>Le Sacre du Printemps</u>.

35. Ibid., F. pp. 144-145; E. p. 143-145.

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