

Olivier Messiaen:
The Centenary Papers

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Edited by

Judith Crispin

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P U B L I S H I N G

Olivier Messiaen: The Centenary Papers,
Edited by Judith Crispin

This book first published 2010

Cambridge Scholars Publishing

12 Back Chapman Street, Newcastle upon Tyne, NE6 2XX, UK

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

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ISBN (10): 1-4438-2498-4, ISBN (13): 978-1-4438-2498-9

For Yvonne Loriod-Messiaen
(20 January 1924 – 17 May 2010)

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ACKNOWLEDGEMENTS

Special thanks are due to the Public Memory Research Centre (University of Southern Queensland), who provided seed funding for this project, and to the Humboldt Universität in Berlin and the Alexander von Humboldt Foundation who generously supported the project to its conclusion.

Personal acknowledgement is due to Dr. Karey Harrison who selflessly helped edit various drafts of his book, despite her modest refusal to be named coeditor. Recognition should also be paid to Prof. Lutz Presser for his rich ideas and advice; and also to Doug Fraser and Prof. Graham Baker who did not know the music of Messiaen but supported this book in the spirit of academic generosity. The editor is also indebted to Prof. Hermann Danuser, Prof. Larry Sitsky, Prof. Marc Battier and Dr. Tobias Plebuch for their warm encouragement and active interest in this publication.

Finally, gratitude should be extended to Prof. Chris Lee, who championed this project in often difficult circumstances, and whose support was always timely and appreciated.

PREFACE

As a young man growing up in Australia in the fifties, the name of Messiaen was still an esoteric reference; one had to actively seek out information on this composer, and it took real effort to find a copy of his book on his technique, some of his scores and the recordings. Performances were few and far between, and those of us who had done some searching felt truly like pioneers. I never dreamt that all these years later I would be writing a preface to a learned book on this composer. Those of us who were among the ‘converted’ were excited purely because this composer seemed to offer some kind of direction and possible solution to the then current dilemma of modern music. The other composer was Hindemith. Why? Simply because, yet again, he too had written a book about his philosophy and his technique, based on truly acoustic and historic considerations. Messiaen, of course, in our eyes was the more seductive alternative; we knew this instinctively, not due to a considered arrival point that he was the more innovative and adventurous composer. I find it somewhat ironic that Messiaen’s experimentations with varieties of serial control became, for a while, the really important aspects of his art; now, with hindsight, I doubt that they would be given the same level of importance in a survey of his output. You will see, merely, by glancing at the chapter titles, the enormous variety and scope covered by the distinguished contributors to this book. Messiaen is now no longer a titillating innovator, but a recognized classic of the repertoire, and so can be written about in a more balanced, considered manner. Like Hindemith, Messiaen can often be caught out, bound by his own theoretical shackles, and therefore risking the danger of predictability. His acoustic forays into the extremely slow dimensions of music are a genuine discovery, as is his attempt to write mantras within a musical and coherent language. His extended use of bird-song is still a very special phenomenon. Non-Australian readers may be interested (or mortified) to learn that thirty years before Messiaen, an Australian composer named Hooper Brewster-Jones composed a series of 73 pieces named “Bird Impressions”, utilizing the calls of Australian birds; these have languished in a dusty archive for almost a century and only recently have been published and recorded. We are enriched by the fact that Messiaen did not have to wait that long!

In recent years, the great Australian pianist Michael Kieran Harvey, performed and recorded the complete Messiaen Catalogue of the Birds. Many many years ago, when I was in the middle of my Messiaen-mania, I planned to do the very same thing, and was sitting with a group of my students discussing the idea. We thought (with the enthusiasm and foolishness of youth) that it could be done in one afternoon. The question then arose of the post-marathon celebration. I said that we would all go out to dinner. One of the students asked what we would eat. I couldn't resist, and said: "Chicken! Of course". The project never happened.

Prof. Dr Larry Sitsky
Australian National University
August, 2010.

INTRODUCTORY NOTE

Dr Judith Crispin

In 2008 musicians and scholars world-wide celebrated the centenary of Olivier Messiaen's birth. One of the most influential composers in living memory, Messiaen is remembered as a great nature poet—a mystic whose music was once composed and performed in the Nazi labour camp Stalag VIII. He was a devout Roman Catholic who created an oeuvre of works to celebrate the grandeur of God's creation. Inspired by the colours of stained-glass windows, birdsongs, Japanese *gagaku*, Hindu chants and ancient Greek modes, the music of Olivier Messiaen had a profound effect on the Twentieth-century avant-garde. His fertile pedagogy produced composers such as Boulez, Stockhausen and Xenakis, among others.

This volume of essays, marking the occasion of Messiaen's centenary, was authored by musicologists, performers, composers, ornithologists and researchers from Australia, Germany, France, North America, Japan, New Zealand, Serbia and England. The writers, internationally acclaimed experts as well as emerging scholars, span three generations—living testimony to the diverse and lasting sphere of Messiaen's legacy.

Mrs Yvonne Loriod-Messiaen, to whom this book is dedicated, sadly passed away before its publication. On May 18, 2010 *The New York Times* published an obituary for Madame Loriod by the eminent musicologist Paul Griffiths. He wrote:

There may be no parallel in musical history to the performer-composer relationship that Ms. Loriod and Messiaen maintained across half a century. It gave rise not only to two immense Messiaen solo works — “Vingt Regards sur l’Enfant-Jésus” (“20 Glances at the Child Jesus”) and “Catalogue d’Oiseaux” (“Bird Catalog”) — but also to shorter pieces and quasi concertos, ranging in scale from the huge “Turangalila Symphony” to “Oiseaux Exotiques” (“Exotic Birds”), for piano with a tight

group of wind instruments and percussion. . . In Ms. Loriord he found a musician who could provide avian qualities of agility and spectacle. “I have,” he once said, “an extraordinary, marvelous, inspired interpreter whose brilliant technique and playing — in turn powerful, light, moving and colored — suit my works exactly.”¹

Olivier Messiaen, Madame Loriord and her sister Jeane visited Australia in 1988. One of the highlights of this book is the Australian ornithologist Sydney Curtis’ intriguing account of taking them to see the famous Albert’s Lyrebird. His essay, cowritten with Dr Hollis Taylor, includes hitherto unknown primary source material including audio recordings and personal correspondence.

Messiaen had been deeply significant to Australian music long before his 1988 visit. Those composers to cite his influence include Nigel Butterley, Roger Smalley and Larry Sitsky. Many authors from this book were also involved in the 2008 First International Conference of Messiaen Studies at the University of Southern Queensland, Australia. And it should also be said that neither the conference nor this book could have happened if not for the actions of Prof. Chris Lee who obtained vital funding by arguing the importance of Australia’s involvement in the worldwide Messiaen centenary celebrations.

One of the most intriguing things about Messiaen was his use of musical language as praise—a sense of sacred joy permeating all his work. “Our suffering”, he once explained “is so near the surface that we do not need to sing about it.” In a century where the avant-garde promoted music as a purely intellectual pursuit, Messiaen’s language of spiritual praise often evoked embarrassment among students and fellow composers. Neither were the Catholic authorities always on side, frequently denouncing his music as “vulgar”. But despite these criticisms Olivier Messiaen continued to express his deep love of nature and his unwavering commitment to God. He will be remembered as a true mystical composer, an architect of modernism, and a friend to birds.

Notes

1. Paul Griffiths, “Yvonne Loriod, Pianist and Messiaen Muse, Dies at 86”, New York Times, May 18, 2010
<http://www.nytimes.com/2010/05/19/arts/music/19loriod.html>
(last accessed aug 6, 2010)

CHAPTER ONE

MESSIAEN AND HIS COLLABORATIVE MUSIQUE CONCRÈTE RHYTHMIC STUDY

MARC BATTIER

Timbres-durées was realised in 1952 in the studio of the Groupe de recherches de musique concrète (GRMC), a research structure founded in 1951 and headed by Pierre Schaeffer, the inventor (in 1948) and theoretician of musique concrète, at 37, rue de l'Université, Paris¹.

Timbres-durées was performed in two concerts in Paris on May 1952, and later presented at Darmstadt. Although it received an additional performance on the occasion of the *Décade de musique expérimentale* in Paris in 1953, it was subsequently withdrawn from the composer's catalogue. However, fragments from a graphical score and a notated score have been reproduced in several publications and are frequently encountered in music history books. In 2005, the Groupe de recherches musicales published a CD of a version of *Timbres-durées*. The piece had been previously unpublished and heard by few.

Fragments of score

During the 1952 concerts, a programme was distributed. It included reproductions of fragments of scores (see Fig 1–1).

Another fragment showed the temporal and spatial distribution of sounds. In approaching this piece, the first problem was to identify those fragments to see if they belonged to larger set. In other words, did a complete realisation or performance score exist? The usual music libraries and music documentation centres did not hold any such complete score. Neither the Bibliothèque nationale

de France nor the French copyright society Sacem held the score of *Timbres-durées*. Thus, there was no certainty that a complete score did exist and, if indeed there was one, that it matched the excerpts published as examples in 1952 (see Fig 2-1).

OLIVIER MESSIAEN - *TIMBRES-DURÉES* -

tempo: $\text{♩} = 144$

①

goutte d'eau E2 f | eau E5 p | phittu vivubé E3 pp | jet d'eau E12 mf | Balais F2 p | to son opul. G3 ff |

halo G7 pp | vivubé pure G3 pp | Ham sitrog. E6 mf | do1 sitrog. F42 p | phittu non vivubé (chèvre G3) |

G6 ff | Ham phittu G3 pp | B4 wiblock f | aign la: si:2 - tris sui - (sym G: clousijs) |

F8 mf | (tambour à friction) aign mf | gran (poulie G3) |

F42 p | tam: à corde la: do1 - phittu vivubé (chèvre G3) | E3 phittu vivubé | do1 - sitrog. E6 mf | jet d'eau E12 mf | Ham sitrog. G3 pp |

F2 Balais p | G7 aign vivubé pure halo | G6 to son opul. G3 ff | B4 wiblock f |

E8 mf | (tambour à friction) aign mf | gran (poulie G3) | aign la: si:2 gran la: do1 | F42 tris sui - G5 Blon métal | aign la: si:2 |

Olivier Messiaen

Fig. 1-1

TIMBRES-DURÉES, DE OLIVIER MESSIAEN

RÉALISATION ET DÉCOUPAGE SPATIAL DE PIERRE HENRY.

Une partition de Musique Concrète comporte: 1° Une tablature ou répertoire des sons utilisés; 2° Un schéma de composition (voir p. 4 le fac-similé du début de la partition originale d'Olivier Messiaen); 3° Une partition de réalisation comportant le découpage spatial (dont deux exemples sont reproduits ci-après: séquence 1 et séquence 19 à 21).

Compte tenu des réductions de la partition originale, les schémas sont les suivants:
Séquence 1: la croche est représentée par 1/4 de centimètre; les croches 19 à 21: la croche est représentée par 1/2 centimètre, correspondant dans les deux cas à 32 centimètres de bande magnétophonique.

RÉPERTOIRE DES SONS
Tempo: ♩ = 144 = 32 cm.

Bou	♩	E2 (attaque début)	Cymbale chinoise	♩	G9
"	♩	E5	Cymbale chinoise et bloc fer	♩	G7
"	♩	E9 (attaque au milieu)	Tom-Tom grave	♩	G3
"	♩	E12	Tom-Tom aigu	♩	G5
	♩	E6 (son homogène)	Wood-block	♩	B4
Fratté balais sur caisse claire	♩	F2 (son rétrograde)	Cymbale chinoise	♩	G12 (attaque sèche)
Tambours à cordes	♩	F12	Bloc métal-cléche	♩	A5
"	♩	F8 son aigu médium grave			

(Les chiffres au dessous des figures indiquent les durées en cm.)

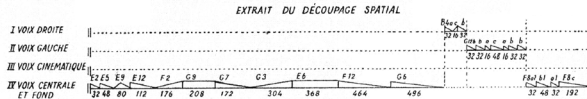


Fig. 2-1

It is documented that *Timbres-durées* was performed from the three-track tape recorder that the GRMC owned and used often. In addition, the literature mentions that *Timbres-durées* was performed using a spatialisation system conceived by Pierre Schaeffer and Jacques Poullin, with which four source channels could be individually controlled in a performance space. Actually, this spatialisation system is well documented. It was first introduced in July 1951 at the Théâtre de l'Empire in Paris for an early concert of musique concrète. Schaeffer even applied for a patent for this system².

Indeed, the spatialisation score distinctly shows that there are four independent channels, implying the sources came from four individual tracks. Hence, where did the fourth track come from?

The figure below (Fig. 3-1) shows an excerpt from the published score fragment in which the four channels are used extensively.

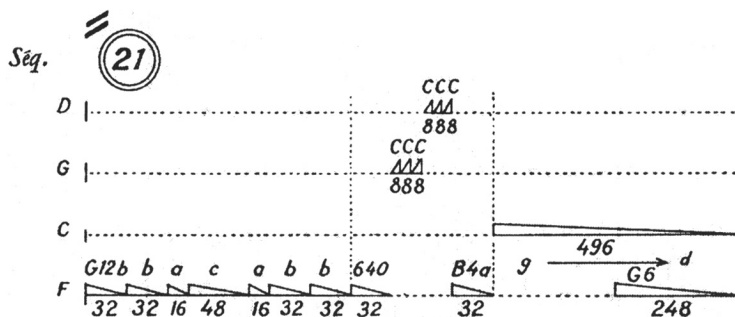


Fig. 3-1

In this fragment, the indications can be fairly easily interpreted as sequence 21, distributed over four channels which are identified by a single letter. In turn, these letters can be deciphered as "Droit" (right), "Gauche" (left), "Cinématique" (kinetic) and "Fond et centre" (back and centre), as indicated from the fragment which shows the beginning of the piece (Fig. 2-1).

Another problem to be solved, since the piece had been withdrawn and the complete score seemed unavailable, was determining the exact role of Messiaen's assistant for the piece, Pierre Henry. For instance, a preliminary version of the 1952 concert programme mentions that a series of studies were to be presented, including³: "Étude pour percussions de O. Messiaen- P. Henry." (Fig. 4-1)

In an other preliminary programme, also discovered in the Schaeffer archives, Messiaen appears as merely a collaborator: "a work realised by Pierre Henry in collaboration with Olivier Messiaen." (Fig. 5-1)

There seems to have been some indecision as to the status of this piece. As it turns out, Messiaen was the first major composer to have been invited to the GRMC studio. Musique concrète was still in its infancy, having been born merely three years earlier. Before Schaeffer decided to invite Messiaen, he had received an offer to set up a whole retrospective of musique concrète. The occasion was the festival *L'œuvre du XX^e siècle*, organized under the auspices of the Congress for Cultural Freedom and on the initiative of composer and

political activist Nicolas Nabokov. There were to be two concerts of musique concrète, on May 21 and 25, 1952, with, in addition, a concert where this music was introduced to the youth. This event took place on May 23. The Messiaen piece was performed in the main concerts, on May 21 and 25.

Groupe de Recherches
de Musique Concrète
-i-i-i-i-i-

Programme du Concert de Fin d'Année

1ère Partie : Rétrospective (1948-1951)

- a) Tam-Tam IV de Pierre Henry
- b) Etude Violette pour Piano de Pierre Schaeffer
- c) Etude Pathétique de Pierre Schaeffer
- d) Bidule en Ut de Pierre Henry et Pierre Schaeffer
- e) Symphonie pour un Homme Seul de Pierre Schaeffer et P. Hen
- Court exposé sur la Musique Concrète de Pierre Schaeffer

2ème Partie : Etudes (1952)

- a) Etude à 1 son de Pierre Boulez
- b) Batterie Fugace de Pierre Henry
- c) Tude de A. Jolivet ~~xxxxPhilippe~~ - J. Barraqué
- d) Antiphonie (1er mouvement) de Pierre Henry
- e) Etude pour Jazz de André Hodeir
- f) 2ème Etude de Pierre Boulez
- g) Etude pour percussions de O. Messiaen - P. Henry

3ème Partie : Spectacle et Musique Concrète

- a) Le Joueur de Bruits (pantomime-Ballet) de Y. Baudrier -
M. Philippet
- b) Maskerage (Film) de Max de Haas et Pierre Schaeffer
- c) Paroles dans l'Espace de Jean Tardieu et Pierre Henry

Salle de l'ancien Conservatoire : Mercredi 21 Mai à 21h.
Vendredi 23 Mai à 21h. (J.M.F.)
Dimanche 25 Mai à 21h.

Fig. 4-1

Deux concerts
de
MUSIQUE CONCRÈTE
les Mercredi 21 et Dimanche 25 mai à 21 heures
salle de l'Ancien Conservatoire.

Chaque concert comportera :

- une introduction de Pierre Schaeffer, illustrée
des exemples sonores,
- une rétrospective,
- des études nouvelles de compositeurs tels que :

Pierre Boulez, Pierre Henry, André Hodeir,
Schaeffer et une œuvre réalisée par Pierre
ry en collaboration avec Olivier MESSIAEN.

Fig. 5-1

Here is an excerpt from Nabokov's introduction to the event:

If a presentation of modern music has a meaning and a some virtue, it is to fight against despair and despondency. Neither the totalitarian ideologists nor the cliques and coteries can lessen the masterpieces which speak for themselves—and for the civilization from which they were born.⁴

The problem Schaeffer faced when he received this invitation was that the whole repertoire of *musique concrète* was meagre. All the pieces had already been presented to the Parisian public the year before and earlier. This might be what led him to set up the first course of *musique concrète* for young composers, in the hope that the repertoire would thus be enlarged. The course (*stage de musique concrète*) began in October 1951 and was divided into two phases. The first phase ended on December 18, 1951. It was composed of a theoretical session each Tuesday, and a practical class each Thursday. It gathered several composers and musicians, such as Jean Barraqué, Pierre Boulez, Yvette Grimaud, André Hodeir, Monique Rollin. . . .

Michel Philippet was also a participant, but in the category of radio technicians, along with others. Of this group, Schaeffer chose three, who were allowed to extend their stay at the GRMC to finish a piece or, rather, an *étude*, in what consisted of the second phase of the course. According to a document from December, in the second phase, some composers would be selected to start a personal work while the others would serve as assistants, helping the other composers, or working on sound classification and on part of the major work by Schaeffer and Henry, *Orphée*, of which several versions had already been realised. This would eventually lead to the controversial performance at the Donaueschingen festival, on October 10, 1953 which damaged the reputation of *musique concrète* for the following years.

The three selected composers were: Pierre Boulez (*Étude à un son* and *Étude II*), André Hodeir (*Jazz and jazz* for piano and tape), and Monique Rollin (*Étude vocale I, d'après un motet anonyme du XIII^e siècle*). The resulting four pieces were added to the *musique concrète* repertoire and presented in the May 1952 concerts, in addition to a new piece by Pierre Henry (*Antiphonie*, 1951) and the piece by Messiaen. Also of note was the piece by Schaeffer, *Masquerade* (1952), which was performed along with a film by Max de Haas.

Schaeffer chose not to ask Barraqué (who completed a study) or Philippet to contribute a piece to the concert. In any case, these two composers took an active part in the first phase of the course (October-December 1951). A feud between Schaeffer and the course composers occurred in March 1952. It was the result of different conceptions of the nature of *musique concrète* research. For Schaeffer, the emphasis of the research had to be the experimental aspect of the process and the collective effort of conducting the experiments. In a memo dated March 7, 1952 and kept in the archives at IMEC⁵, Schaeffer wrote "I warned you on several occasions against a premature anticipation in the ordering of our work, which consists of experimental works, without any esthetical claim, and, above all, which aims at creating a sonic domain and manipulation techniques."⁶ Among the problems which seemed to have arisen in this second phase of the course, in which some composers were selected by Schaeffer to complete a study (or two, in the case of Pierre Boulez), was the question of the collective approach to musical research⁷. This crisis occurred while Messiaen was working on his *musique concrète* piece and, in his

memo, Schaeffer made an indirect reference to composers who had been invited to the studio and who were more advanced in their career. Messiaen was, at this time, the only invited composer.

In any case, Schaeffer referred the Messiaen project to Pierre Henry, who had joined him in the very early beginnings of the musique concrète adventure. This was certainly an astute choice, as Henry had been Messiaen's pupil at the Conservatory, where from 1944 to 1947, he attended Messiaen's harmony class (which Boulez also attended in the first year) then, in 1947, the new class of *Esthétique et analyse musicale*. Henry, thus, knew Messiaen and was certainly aware of his master's composition techniques.

This is how Pierre Schaeffer talked in 1959 about Messiaen and *Timbres-durées* in a radio program with Marie-Claire Patris.

Stepping [with Messiaen] into the studio, I was so proud of all the sound equipment that I expected him to build some kind of Turangalîla of 'sons concrets', but I was disappointed... He whispered, with his usual blend of naivety and mischievousness:
"I would like as little sound as possible... almost no sound."

Not quite understanding what he [Messiaen] wanted, I let Pierre Henry, who had been his pupil, provide him with this 'almost no sound' which he asked for. The result was *Timbres-durées*.⁸

When the work with Messiaen began, Schaeffer and Henry had been involved in setting up a curriculum for the musique concrète course. This was much needed as the interns were to meet every week and receive teaching from those with experience (Schaeffer, Henry, Jacques Poullin). An account of each session was then given in writing. In other words, the course gave birth to a methodology of musique concrète education which was used throughout the 1950s and well into the 1960s.

Among the topics taught was an item which cannot be found in other writings of Schaeffer. It probably was introduced under the influence of Pierre Henry. It appeared in the session of December 11 under the name "Orchestre concret" (Fig. 6-1)

Mardi 24 octobre - YNJV - Généralités, Vocabulaire
 Mardi 21 octobre - ZLH - Classification, notation
 Mardi 6 novembre - YNJV - rrélèvements
 Mardi 13 novembre - YNJV - transmutations
 Mardi 20 novembre - YNJV - transformation
 Mardi 27 novembre - YNJV - monophonies harmoniques (instruments préparés
 rhonogène, montage clavier)
 mardi 4 décembre - YNJV - monophonies sérielles (montage série)
 Mardi 11 décembre - YNJV - vrches tre concret, notation
 Mardi 16 décembre - YNJV - oeuvres et partitions

Fig. 6-1

Timbres-durées as musique concrète

According to Christopher Murray, work on *Timbres-durées* began in February 1952.⁹ The early sketches show that from the onset the work was oriented towards the use of percussion sounds. It may even have been thought of as a piece for percussion, as indicated in one of the sketches, but nevertheless it quickly settled on a selection of percussion sounds and sounds derived from recordings of various types of water manipulation. In the end, the concrete sounds were divided in two groups.

1. Percussion sounds

Messiaen chose these sounds from a "orchestre concret" composed of several percussion instruments.

The influence of Pierre Henry is apparent in the mention of "prepared timpani" (*timbales préparées*) with cymbals, xylophones and vibraphone bars, felt, etc. Pierre Henry was a piano and percussion player. He often mentioned the fact that, even before being associated with the Schaeffer studio, he had experimented with prepared piano. His later work demonstrates clearly that he always had an inclination toward the manipulation of sound sources in front of the microphone, such as in *Variations pour une porte et un soupir* and in many other works.

The sounds were gathered from a collection of recordings which were stored in the studio library. They were sorted out and labelled by Michelle Henry, who worked regularly at the studio and also was the wife of Pierre Henry at the time. In the musique concrète spirit, several recordings were submitted to various processing techniques.

The techniques one can perceive in *Timbres-durées* are: reversal of magnetic tape, change of dynamic profile, and transposition using the device invented by Schaeffer, the keyboard phonogène. This device was based on a tape recorder. A loop of magnetic tape was played in front of a series of playback heads. By pressing one of the twelve keys, the operator was able to select a degree of diatonic transposition within one octave. This process was applied to the recording of a string drum, which can be clearly heard throughout the piece.

Here is the list of percussion sources which yielded ten different sound samples:

- Chinese (crash) cymbal
- Anvil / Steel bar (*bloc de fer*)
- Tam-tam (low and high)
- Wood-block
- Steel plate / Steel bar (*bloc métal-cloche*)
- String drum / Lion's roar (*tambour à cordes*)
- Snare drum (with brush) / *frotté balais sur caisse claire* [*played backwards*]

2) Natural sounds: sounds of water.

The other category of sounds came from various recordings of water. There were short sounds as well as longer sounds, some looped and others played backwards (Fig. 7–1)

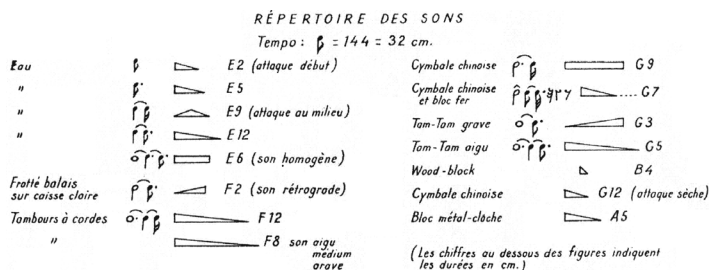


Fig. 7–1

The short sounds consisted of drops of water falling in a bucket, while longer sounds came from pouring or agitating water in

a container. Through studio techniques the sounds received dynamic profiles, attacks and morphological transformation by playing some of them backwards. These yielded five different water sound samples.

Each sound sample was stored on a specific reel. The sounds received a code number, while the reel was identified by another code. The sound codes appear in the scores, while the reel codes are used in the sketches.

The scores

Although composing a piece of musique concrète rarely required a score, several types of notation were occasionally used. Indeed, representing "objets concrets" was a concern at GRMC. Schaeffer hired someone for the purpose of sorting out the numerous recordings of concrete sounds—Shellac discs and magnetic tape. This person, Michelle Henry, also had the task of researching the graphical representation of musique concrète. As early as 1948, Schaeffer had attempted to use notation, and he embarked, with the collaboration of Abraham Moles, to find a technical, or rather, scientific way of representing sounds. Other early examples of scores from the Paris School were the 1952 studies by Pierre Boulez, which are a relevé of the transposition operations done with the phonogène over time, and *Antiphonie* by Pierre Henry, a serial experiment also from 1952.

In any case, although I started this research on the Messiaen piece armed only with these fragments of scores and a recording of the piece, I quickly began to look for other documents. They were ultimately found in the personal archives of Pierre Henry, who lives and works in a private house in Paris. There, with the help of the composer himself and of his assistant, Bernadette Mangin as well as Isabelle Varnier, a number of unpublished documents were found. Above all, the score was uncovered. To my surprise, it differed from the published fragments, but, to my relief, both matched. Another discovery was that there wasn't only one score, but three. They were all hand written. To distinguish between them, I will name them: composition score, realisation score, and diffusion score.

As so often occurs in electroacoustic music, the distinction between these three stages, composition, realisation and diffusion, is

not clear cut. Compositional decisions may be taken at any stage. This is reflected in these scores.

Timbres-durées is quite unique in the repertoire of electroacoustic music: some pieces may have one or even two scores, but three is not to be found. Of course, they correspond to different stages of the life of the piece; but, unlike scores by other composers, they make little reference to the realisation procedures other than a verbal indication of the type of processing applied to sound samples. However, the sketches found in the Henry archives have precious indications on the realisation operations, indicating the reel number and the phonogène command information. As the reader may know, the phonogène apparatus has disappeared altogether. All that remains are iconographic documentation and additional records such as patents, which inform us as to the modes of operation of the device. It appears that quite a large amount of work has been done in the preparation of the sounds. Hence, the choice of the word "timbre" in the title of the piece can be traced to the careful selection of sound sources and processing manipulations done in the studio. According to Pierre Henry, it was he who made the manipulations. The reason, as he put it, was because he knew the studio operations and could attain the desired result by applying the techniques he had developed. Messiaen would comment on the sounds, and Schaeffer would often drop by the studio to listen and make remarks.

The composition score

At any rate, the composition score was handwritten over nine pages. The indications are: the rhythms, the corresponding sound sources identified by a code number, which match the list of sounds (see Fig. 2–1) and a note about the sound behaviour, and numbers increasing from 1 to 24, which are the sections identifications.

The composition score had obviously been written after experiments were conducted on the aspect of timbre. Pierre Henry had realised a vast number of sound experiments, using of a selection of sounds from the GRMC disc and tape library, for Messiaen to choose from. These selected samples became the very material of the piece and are explicitly referred to in that score. Although many sounds

were first submitted to processing, only a few were eventually chosen. These made their way into the composition score. It is then considered the result of the studio work, conducted by Pierre Henry under the supervision of Messiaen and the scrutiny of Schaeffer, and, of course, the application of a number of preconceived and highly formalised compositional decisions made by Messiaen.

The linear score

Another score, named here for the purpose of analysis, linear score or realisation score, is a graphical representation of the whole piece (see Fig. 8–1). It is composed of a single temporal line. There is no time indication other than the tempo, but each sound is represented along with its code name and its duration expressed in length of tape. The linear score is composed of eleven sheets.

The "realisation" score is a linear concatenation of sound events (see Fig. 9–1). It is a graphical transcription of the notated score. Each sound is represented as small triangle or rectangle, depending on its dynamic profile, and has two attributes: the code name of its sound source and its duration expressed in centimeters of magnetic tape. It also shows events that were later removed (or not realised). In this respect, it is an intermediary step which proves useful to understand the composition process.

Here is the correspondence between the length of tape and the note duration, including the tempo marking (Fig. 10–1). At the time of the realisation of *Timbres-durées*, tape recorders at Paris Radio used the speed of 76 centimeters per second (30 ips).

The spatialisation score

The third score is most interesting in studying the actual tape piece. It shows the spatial distribution of the piece. Indeed, it matches the recordings, of which I know two versions. The published version of the recording came out in 2005 in a series of five compact discs put out by the INA-GRM. Because the third score does not show any of the deleted sections which appear in the previous scores, it has evidently been written later. It is composed of twenty five sheets (Fig. 11–1)

