Introduction

While musicologists have long been aware that memorization played an important role in medieval education and that much of the music of the period was sung by heart, the role of memory in the creation and dissemination of polyphony remains to be studied. The reason for this neglect is simple. The music of the first important polyphonic collection, the Magnus liber organi, was written down in a notation that for the first time in music history attempted to specify not only pitch, but also rhythm. Consequently, the repertory has long been recognized as a milestone in the development of European art music. Thus, it was natural for scholars to approach the repertory with the same questions that were so fruitful for later European repertories, questions of authenticity and chronology. In other words, scholarship has tended to focus on the musical texts and their interrelationships, rather than on the cultural practices that produced the sources in which these texts are preserved. Underpinning this scholarship has been an unexamined assumption that the musical culture that produced the Magnus liber was literate in the same sense and to the same degree as later European music cultures.

Yet the repertory exhibits many features that are characteristic of oral transmission. The three main manuscripts of the Magnus liber organi are so different that it is impossible to arrive at a critical edition. Thus, the editor of the most recent edition, Edward Roesner, has chosen to publish the versions transmitted in each manuscript separately.[1] More than any later repertory, Notre Dame polyphony is characterized by what Fritz Reckow called "pasticciohaftigkeit," an appropriately macaronic term.[2] Scholars have generally explained the extensive interrelations among pieces as a re-

1. Roesner, ed., *Magnus liber organi.*
2. Reckow, "Das Organum," 474.

sult of the medieval habit of glossing and commenting on existing texts. Yet do we really know how and by whom the music was made and transmitted? None of the compositions is attributed to a specific composer in the manuscripts. Even though the performance of Notre Dame polyphony is attested in 1198 and 1199, all of the extant manuscripts were copied in the middle of the thirteenth century. It seems unlikely that all earlier manuscripts were lost. And finally, as Craig Wright has shown, there is every indication that the music was sung by heart; not a single manuscript is associated with Notre Dame.[3] In fact, no manuscript of polyphonic music ever appears in the lists of choirbooks or the inventories of the library, the treasury, the bishop's chapel, or the chapter house of Notre Dame. In short, there is every reason to investigate the possibility that this repertory was orally transmitted and that memory played a role in its creation.

While it seems somewhat surprising that so few scholars have explored the role of memory in Notre Dame polyphony, it makes perfect sense that no attention has been paid to a possible relationship between the art of memory and fourteenth-century isorhythmic motets. These are compositions in the modern sense of the word, attributed to specific composers. Thanks to Ars nova notation, which for the first time gave explicit relative durational value to every single note, composers were able to notate essentially every rhythm they wanted. The compositions display sophisticated structures with repetitive melodic and rhythmic patterns that would be jeopardized if a performer or scribe altered even a single note. In fourteenth-century isorhythmic motets these patterns were often applied to all parts and subjected to various manipulations such as retrograde motion and diminution.

Yet these works might also have benefited from the art of memory. First, it is generally assumed that they were sung by heart. Second, and more importantly, as Daniel Leech-Wilkinson and Jessie Ann Owens have shown in their pathbreaking studies, polyphonic pieces of the fourteenth through sixteenth centuries were not worked out in score but composed in the mind.[4] To us it seems difficult to imagine how this could be achieved. The question we would want to ask is whether the art of memory might not have provided composers with methods for creating polyphonic structures in the mind.

Just this short overview suggests that a study of the possible impact of the art of memory on music of the Middle Ages is long overdue. We would want to know how medieval singers managed to memorize and retrieve the chant. How was Notre Dame polyphony conceived? Was there such a thing as a final

3. Wright, *Music and Ceremony,* 335.

4. Leech-Wilkinson, "Machaut's *Rose, Lis*"; *Machaut's Mass*; *Compositional Techniques*; "*Le Voir Dit* and *La Messe de Nostre Dame*"; "*Le Voir Dit:* A Reconstruction"; Owens, *Composers at Work.* See also her "Milan Partbooks."

version of a composition? Can we really talk about composers? Was the composing done in writing or in the mind? If in the mind, at which point and by whom was the result transcribed into writing? Did the person who added a new text to preexistent music, or who borrowed from such music in any form, have the original text and melody written in front of him, or did he know the piece by heart? And why were thirteenth- and fourteenth-century composers so obsessed with creating tightly organized structures? (I certainly do not believe that all they wanted to do was to create a musical parallel to Gothic cathedrals.) How were isorhythmic motets conceived, in the mind or in writing? While we cannot expect to answer all of these questions, we will certainly be able to answer some if we begin to pay closer attention to the cultural context in which medieval music functioned. It is time to move beyond the vague parallels between isorhythmic motets and Gothic cathedrals, say, and look for relevant cultural contexts closer to home.

Among a number of book-length studies that have fundamentally transformed our understanding of the role of memory in composition and transmission of texts in pre-modern Europe, at least eight stand out: the precursors with particular interest in the Renaissance were Paolo Rossi, *Clavis universalis* (1960) and Frances Yates, *The Art of Memory* (1966). Jack Goody approached the problem from an anthropological background in *The Interface between the Written and the Oral* (1987). Mary Carruthers demonstrated the importance of the art of memory for the Middle Ages in her two monographs, *The Book of Memory* (1990) and *The Craft of Thought* (1998). Janet Coleman provided a survey of ancient and medieval philosophical thought on memory in *Ancient and Medieval Memories* (1992); Lina Bolzoni continued the exploration of the importance of the art of memory for the Renaissance in *La stanza della memoria* (1995), while Jocelyn Penny Small has connected the ancient art of memory to cognitive psychology in *Wax Tablets of the Mind* (1997). Of these, two authors have had a major influence on my thinking on this subject. Jack Goody has argued that it makes little sense to maintain a clear-cut distinction between oral and written culture. Instead, he suggests replacing it with a distinction between oral culture, on the one hand, and oral plus written and printed culture, on the other. The result is a considerable refinement of how formulas function in societies that have knowledge of writing, but still work out pieces in the mind. The adjustment Goody proposes might seem small, but it helps us to move away from the idea that once writing was invented, all features of an oral culture rapidly disappeared. It allows us, instead, to see in the musical culture of the Middle Ages a rich and complex interplay of oral and literate features. For me, Goody's discussion of the effects of writing on early literate societies is of particular interest: once you see something written down, you are able to analyze it, to compare texts. Writing resulted in the study of grammar, the making of lists and catalogues, the hierarchical classification of objects. Moreover, Goody

shows that writing did not eliminate memorization; quite the contrary, the written page permitted different ways of memorizing material and texts. To quote Goody, "what is interesting about early schooling is that at the very moment when memory could be dispensed with for certain purposes, precise, verbatim recall came into its own."[5]

My work has also benefited tremendously from the groundbreaking books of Mary Carruthers. She too stresses that the introduction of writing resulted not in the elimination of memory, but in increased memorization. She has described this in fascinating detail and explained why the quality most admired among the learned throughout the Middle Ages was a well-developed memory. A scholar built up a memorial archive throughout his life from which he would draw in the process of composition. Thus, composition was not about creating a new, innovative work, as it has become in modern times: "Composition is not an act of writing," Carruthers says, "it is rumination, cogitation, dictation, a listening and a dialogue, a 'gathering' *(collectio)* of voices from several places in memory."[6] But perhaps most importantly, she demonstrates that the same techniques that were used to memorize existing texts were also used to create new works. An author who composed a work in his mind visualized it, usually with the aid of an imaginary architectural structure, or on a written page. These ideas are of central importance for our own understanding of the medieval compositional process in any field, music included.

The present study is an attempt to answer some of the questions posed earlier, an attempt inspired by the insights of a number of scholars of ancient and medieval culture, and guided by the desire to link our understanding of how medieval music came into being and was preserved with what we know about the creation and transmission of pre-modern texts in general. It is not a comprehensive study, but only a beginning, an exploration of several key aspects of this vast topic.

My first chapter is a historiographical study. It has become increasingly clear to me that the main reason musicologists have been applying Beethovenian art concepts to Notre Dame polyphony is connected with the fact that the field was created by the great German scholar Friedrich Ludwig, who transcribed and catalogued all medieval polyphony. In fact, he did it so well that subsequent generations of scholars have questioned almost none of his conclusions and reasoning, believing that he was doing a strict *Wissenschaft* without any presuppositions. A detailed reading of his publications made it clear

5. Goody, *Interface between the Written and the Oral,* 234.
6. Carruthers, *Book of Memory,* 197–98.

that he was full of prejudices of the evolutionary progressive kind. He judged medieval polyphony by comparing it to the music of his favorite composer, Palestrina, arrived at a chronology on the basis of Palestrina's style, and applied criteria relevant to the nineteenth-century autonomous artwork in trying to attribute compositions to composers and establish which version of a piece came first. Moreover, his work is full of blind spots, and he failed to ask some fundamental questions. He did not address the issue that medieval composers constantly reuse the same material, and he had little interest in music theory and the culture of the period.

I then contrast Ludwig with the slightly younger Swiss scholar Jacques Handschin, who brought none of these prejudices to music. However, Ludwig's hold over the discipline remains so strong to this day that subsequent scholars preferred to refine his questions rather than recognize that many of his presuppositions were wrongheaded. Ludwig's obsession with fact-finding and his exclusion of all cultural context can be blamed for the fact that to this day there are almost no studies of the impact of the art of memory on polyphonic music.[7]

The main body of the book is divided into two parts: the first explains how medieval musicians established their memorial archive; the second explains how composers used this archive in the compositional process. The memorial archive of the medieval musician had three components: chant, elementary music theory, and counterpoint. While the first two areas were important from the Carolingian times on, counterpoint acquired importance from the twelfth century on. The central question I will attempt to answer in each of the three areas is how its particular material was memorized.

In chapter 2, I suggest that music theorists and singers compiled tonaries not only, as is generally known, to choose the transition from the antiphon to the psalm verse, but also in order to memorize the chant. Tonaries classify chant first according to mode, then, within each mode, according to various differences, and then within each difference, liturgically, alphabetically, and by the distance from the final. Classification of material is generally a sign that it was intended to be memorized. Similar cataloging activity occurred in other disciplines in the Middle Ages. Elementary memory treatises recommend that if one wants to memorize long texts such as the psalms, the material needs to be divided into smaller units. More importantly, florilegia consist of excerpts and maxims from classical and biblical texts classified according to subject or alphabet. They functioned as memorial promptbooks to help in the preparation of sermons. Tonaries and florilegia were created with the same intention, to help memorize texts.

Chapter 3 concentrates on elementary theory treatises. After having mas-

7. See chap. 2 for a discussion of memorization of chant.

tered the chant, students had to learn intervals, the gamut, and, from the eleventh century on, solmization syllables and the hexachord. In this chapter, I consider not so much what they had to learn, but how they memorized the material. We encounter various short mnemonic verses to teach intervals, solmization syllables, etc. Equally important, entire treatises are often versified in order to help the student remember the material better. Finally, theorists use old mnemonic devices represented through a drawing, such as a tree, a house, and most importantly, the hand. In ancient mnemonic texts these structures were first memorized and then filled with whatever needed to be learned. Similarly, the hand was used for memorizing intervals as well as the gamut, and trees were used for memorizing modes and later the mensural system.

After having memorized the chant and elementary music theory, students from the twelfth century on (if not earlier) would learn how to perform and compose polyphonic music, the subject of chapter 4. Here too my work has benefited from the example of scholars working in neighboring disciplines. Historians of mathematics stress that arithmetic treatises of the Middle Ages and Renaissance are less interested in listing general rules than in describing individual problems for which they find solutions. Thus, the student essentially memorized the entire textbook. The same is true of counterpoint treatises: for us they make tedious reading, because the author will go through every single tone of the gamut and list all possible consonances, and then he will go through every possible interval and list all possible consonances. Again, authors and scribes will use various graphic means to help in the process of memorization. The consonances are then summarized in tables very similar to our multiplication tables that again were clearly memorized. Thus, musicians were less concerned with learning basic rules and more with memorizing various alternatives for setting melodic formulas.

The memorization of consonance tables and interval progressions brings up interesting problems about composition in the mind versus composition on paper and thus makes a smooth transition to the second part of the book. Jack Goody has pointed out that Egyptian mathematicians did their multiplications step by step and entirely in writing, while we, who have memorized multiplication tables, are able to do quite complex problems in our mind. Thus, the ability to write does not exclude composition in the mind. The situation is not much different in music: once students had memorized consonant intervals, basic progressions, and entire phrases, they were then able to plan entire compositions in their mind without having to write them down.

Part 2 is concerned with how the art of memory influenced the composition of music. In chapter 5, I explore the possibility that the rhythmic modes of Notre Dame polyphony were used as a mnemonic device. The rhythmic

notation of Notre Dame polyphony is characterized by regularly recurring patterns of long and short notes. We would want to know why composers and theorists insisted on using inflexible rhythmic patterns even though separate note values that made flexible rhythms possible were already available. I would like to suggest that the invention of modal rhythmic notation might be related to the contemporary passion for didactic quantitative Latin poetry, where difficult material was put into verse form so that it could be remembered better. In both cases, the rhythmic organization depends on a regular pattern of long and short units: syllables or notes.

The last chapter attempts to answer the question of how polyphonic compositions, in particular isorhythmic motets, could have been composed in the mind. As mentioned above, we know that polyphonic pieces had been composed without the use of scores. For us it seems incomprehensible how this could have been achieved. There are three possible ways in which the art of memory could have influenced composition. First, the memorization of consonance tables and interval progressions allowed one to work out pieces in the mind. Second, I suggest that musicians were visualizing the music in their imagination rather than writing it down. Sight treatises make it clear that visualization played an important role in improvisation and composition. These treatises belong to a venerable tradition of texts describing mnemonic devices and have to be regarded as offering a first step in the compositional process. Advanced composers would be able to apply the same technique to entire polyphonic compositions. Third, mnemotechnics also provides an important background to understanding isorhythmic motets. We would want to know why thirteenth- and fourteenth-century composers were so obsessed with tightly organized sectional structures. I believe that *ars memorativa* provides a relevant background. The most common ancient and medieval technique of memorizing a text involved dividing the text into sections, devising individual "images" for each section, and locating these symbols in a reusable grid of "places." The grid of places fixed the temporal order in which the images would be recalled, and each image helped to bring to mind the section of the text with which it had been associated. Throughout the Middle Ages, it is not only the ability to retain something in memory that is admired, but also the ability to manipulate the material. If medieval writers could use mnemonic devices to construct their treatises and sermons, it should not be surprising that musicians used similar techniques when composing music. While a medieval scholar could demonstrate that he had really "learned" or "mastered" the text when he could recite it backwards, a medieval musician might be admired for applying inversions and retrograde movement to his tenors.

I hope that the results of this investigation will illuminate the intellectual and cultural world of the medieval musician. I would like to recapture the

categories and images in terms of which musicians thought about their practice and imagined the materials of their art. I hope to challenge the assumption of pure literacy and replace it with a more complex picture of a world in which literacy and orality interacted. Thus, music will be placed in the larger cultural context of the period, not only within the already much studied written tradition, but also within the thus far unexplored tradition of *ars memorativa*.