



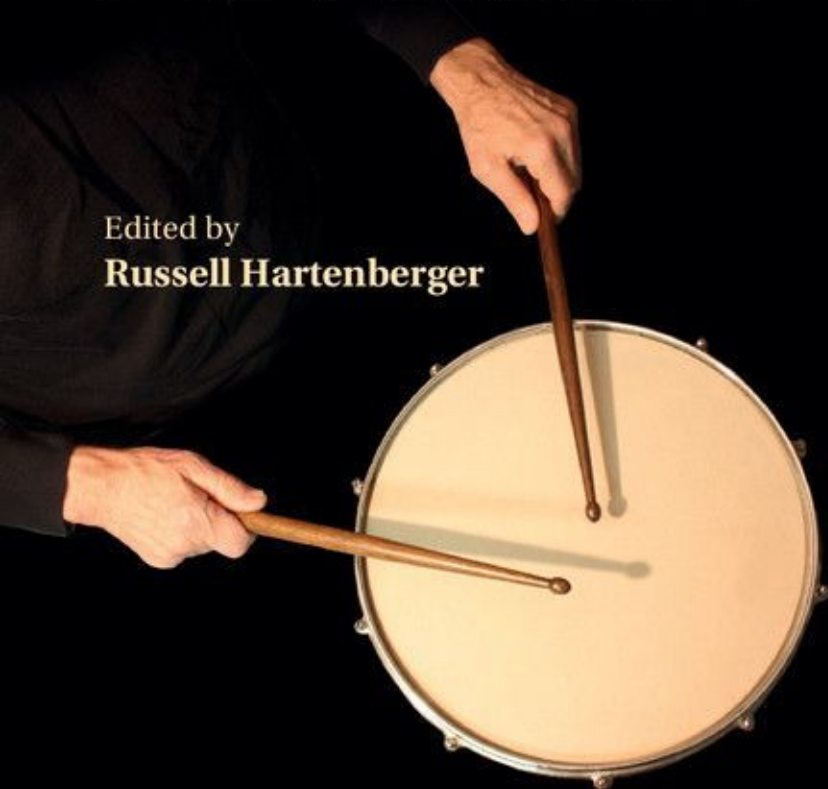
The Cambridge

Companion to

# *Percussion*

Edited by

**Russell Hartenberger**



## The Cambridge Companion to Percussion

Percussion music is both the oldest and most recent of musical genres and exists in diverse forms throughout the world. This *Companion* explores percussion and rhythm from the perspectives of performers, composers, conductors, instrument builders, scholars, and cognitive scientists. Topics covered include percussion in symphony orchestras from the nineteenth century to today and the development of percussion instruments in chapters on the marimba revolution, the percussion industry, drum machines, and the effect of acoustics. The chapters also investigate drum set playing and the influences of world music on Western percussion, and outline the roles of percussionists as composers, conductors, soloists, chamber musicians, and theatrical performers. Developments in scientific research are explored in chapters on the perception of sound and the evolution of musical rhythm. This book will be a valuable resource for students, percussionists, and all those who want a deeper understanding of percussion music and rhythm.

RUSSELL HARTENBERGER is Professor at the University of Toronto and has been a member of both Nexus and Steve Reich and Musicians since 1971. With Nexus, he created the sound track for the Academy Award-winning Documentary Feature *The Man Who Skied Down Everest*. With Steve Reich and Musicians he has recorded for ECM, DGG, and Nonesuch Records and performed on the Grammy Award-winning recording of *Music for 18 Musicians*. His awards include the Toronto Arts Award, Banff Centre for the Arts National Award, a Juno nomination, and induction into the Percussive Arts Society Hall of Fame.

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EDITED BY

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## Contents

<i>List of figures</i>	page ix
<i>List of music examples</i>	xi
<i>Notes on contributors</i>	xiii
<i>Acknowledgments</i>	xvii
Introduction <i>Russell Hartenberger</i>	1
PART ONE <b>Orchestral percussion</b>	5
1 Timpani traditions and beyond <i>Russell Hartenberger</i>	7
2 Orchestral percussion in the twenty-first century: concerns and solutions <i>William L. Cahn</i>	21
PART TWO <b>The development of percussion instruments</b>	41
3 Marimba revolution: mallet instruments, repertoire, and technique in the twenty-first century <i>William Moersch</i>	43
4 Instrumental ingredients <i>Garry Kvistad</i>	55
5 The percussion industry <i>Rick Mattingly</i>	67
6 Virtual drumming: a history of electronic percussion <i>Thomas Brett</i>	82
PART THREE <b>Percussion in performance</b>	95
7 Lost and found: percussion chamber music and the modern age <i>Adam Sliwinski</i>	97
8 Taking center stage: percussionist as soloist <i>Colin Currie</i>	116
9 Percussion theater: the drama of performance <i>Aiyun Huang</i>	128
10 Three convergences: a percussionist learns to conduct <i>Steven Schick</i>	143

<b>PART FOUR Composing music for percussion instruments</b>	<b>159</b>
11 Finding a voice <i>Bob Becker</i>	161
12 Flexibility as a defining factor <i>Jason Treuting</i>	168
13 Thoughts on percussion and rhythm <i>Steve Reich</i>	173
<b>PART FIVE Drum sets and drumming</b>	<b>185</b>
14 In the pocket: how a drum set player grooves <i>Peter Erskine</i>	187
15 The “Funky Drummer” break: ghost notes, timbre, and popular music drumming <i>Steven F. Pond</i>	201
16 Way beyond wood and skin: drum sets, drumming, and technology <i>Jeff Packman</i>	211
<b>PART SIX World percussion</b>	<b>227</b>
17 Speaking of rhythm <i>Russell Hartenberger</i>	229
18 African influences on Western percussion performance and pedagogy <i>B. Michael Williams</i>	241
19 The gamelan beleganjur as Balinese percussion ensemble <i>Michael B. Bakan</i>	253
<b>PART SEVEN Percussion and rhythm</b>	<b>265</b>
20 Lessons from the laboratory: the musical translation of scientific research on movement <i>Michael Schutz</i>	267
21 In the beginning was the beat: evolutionary origins of musical rhythm in humans <i>John R. Iversen</i>	281
<i>Select bibliography</i>	296
<i>Index</i>	301

## Figures

- |     |                                                                                                                                                                                                                                          |        |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| 1.1 | Drawing of Ernst Pfundt by Carl Reimers. Photo courtesy of: Leipzig, Stadtgeschichtliches Museum, Carl Reimers, Ernst Gotthold Pfundt (1827–1871) Inv. No. Müller-Sammlung XIX/38a.                                                      | page 9 |
| 1.2 | William G. Street (1895–1973), oil on canvas (2004) by Sari Gaby. Photo: William L. Cahn.                                                                                                                                                | 13     |
| 1.3 | Fred D. Hinger, portrait (1966) by Shirley Hinger Corbett. Courtesy of Shirley Hinger Corbett.                                                                                                                                           | 14     |
| 3.1 | Keiko Abe. Photo courtesy of Keiko Abe.                                                                                                                                                                                                  | 48     |
| 4.1 | Garry Kvistad with <i>Mallet Phase</i> instruments and Olympos wind chimes. Photo: Carol Judson.                                                                                                                                         | 64     |
| 5.1 | Avedis Zildjian III in front of old Zildjian factory. Photo courtesy of Zildjian Co.                                                                                                                                                     | 79     |
| 6.1 | Rhythmicon built at the Acoustical Laboratory at Moscow Conservatory in the mid-1960s as part of Léon Theremin's research project. It is in working condition and in the collection of Andrey Smirnov. Photo courtesy of Andrey Smirnov. | 83     |
| 7.1 | John Cage Percussion Inventory. Courtesy of John Cage Correspondence Collection, Northwestern University and the John Cage Trust.                                                                                                        | 102    |
| 7.2 | John Cage with lion's roar, tin cans, wash tub, flower pots, and Chinese tom-tom. Photo courtesy of Percussive Arts Society, <a href="http://www.pas.org">www.pas.org</a> . Printed with kind permission.                                | 106    |
| 7.3 | Nexus playing <i>Third Construction</i> . Clockwise from left: Garry Kvistad, Bill Cahn, Russell Hartenberger, Bob Becker. Photo courtesy of John Cage Trust; Photo: Donald Dietz.                                                       | 111    |
| 8.1 | Colin Currie. Photo: Marco Borggreve.                                                                                                                                                                                                    | 117    |
| 9.1 | <i>Dressur</i> , opening stage direction. Copyright © 1977 by Henri Litolff's Verlag. Used by permission of C. F. Peters Corporation.                                                                                                    | 132    |
| 9.2 | ? <i>Corporel</i> , opening. Copyright © 1989 by Henri Litolff's Verlag. Used by permission of C. F. Peters Corporation.                                                                                                                 | 134    |
| 9.3 | ? <i>Corporel</i> , m. 13. Copyright © 1989 by Henri Litolff's Verlag. Used by permission of C. F. Peters Corporation.                                                                                                                   | 135    |

9.4	<i>Aphasia</i> , m. 1. Used by kind permission of the composer.	136
9.5	<i>Musique de Table</i> , instruction. Used by kind permission of the composer.	137
9.6	Aiyun Huang in performance. Photo: Bo Huang.	139
10.1	Steven Schick. Photo: Bill Dean.	148
13.1	Steve Reich at Brooklyn Bridge. Photo courtesy of Boosey & Hawkes; Photo: Jeffrey Herman.	174
14.1	Peter Erskine. Photo courtesy of Tama Drums.	193
17.1	Suba Sankaran and Trichy Sankaran. Photo: Greg King.	230
18.1	<i>Gungon</i> . Photo: Bonnie Shekter.	242
18.2	<i>Mbira dzaVadzimu</i> . Photo courtesy of B. Michael Williams; Photo: Adam Snow.	249
19.1	The <i>Gamelan Beleganjur</i> . Photo: Michael X. Redig.	254
20.1	Time-lapsed images from Schutz and Lipscomb study showing long and short striking motions. Photo courtesy of Psychology Press/Routledge and Michael Schutz.	274

## Music examples

1.1	Four sixteenth-note groups without Tabuteau phrasing.	page 16
1.2	Tabuteau motion numbers to demonstrate forward motion. David McGill, <i>Sound in Motion</i> , p. 73, © 2007. Reprinted with kind permission of Indiana University Press.	16
7.1	<i>Third Construction</i> , second half of letter S, mm. 469–480. Dense counterpoint and interplay. Copyright C.F. Peters Publishing Co., used with kind permission.	100
7.2	<i>Third Construction</i> , second half of letter “O,” mm. 373–384. Tin can climax. Copyright C.F. Peters Publishing Co., used with kind permission.	105
7.3	<i>Third Construction</i> , instrument key, players one and two. Copyright C. F. Peters Publishing Co., used with kind permission.	108
7.4	<i>Third Construction</i> , second half of letter “G.” Clave trio. Copyright C. F. Peters Publishing Co., used with kind permission.	109
9.1	<i>Dressur</i> , “chair” instructions, mm. 5–8. Copyright © 1977 by Henri Litolf’s Verlag. Used with kind permission of C. F. Peters Corporation.	132
9.2	<i>Les Guetteurs de Sons</i> , mm. 24–30. Used with kind permission of the composer.	138
9.3	<i>Les Guetteurs de Sons</i> , m. 187. Used with kind permission of the composer.	139
9.4	<i>Victor Hugo</i> , animal sounds. Used with kind permission of the composer.	140
9.5	<i>Victor Hugo</i> , text. Used with kind permission of the composer.	141
9.6	<i>Victor Hugo</i> , dance movements. Used with kind permission of the composer.	141
12.1	Score to <i>June</i> .	171
14.1	“Billie’s Bounce.” Used with kind permission of Alfred Music.	188
14.2	“Billie’s Bounce,” eighth-notes notated as dotted-eighth/sixteenth-note combinations. Used with kind permission of Alfred Music.	188

14.3	“Billie’s Bounce,” swung eighths notated as triplets. Used with kind permission of Alfred Music.	189
14.4	“Billie’s Bounce,” <i>legato</i> phrasing. Used with kind permission of Alfred Music.	189
14.5	Ride cymbal triplet notation. Used with kind permission of Alfred Music.	190
14.6	Ride cymbal, tied quintuplet groupings. Used with kind permission of Alfred Music.	190
14.7	Swing feel explanation. Used with kind permission of Alfred Music.	190
14.8	Sam Woodyard cross-stick pattern. Used with kind permission of Alfred Music.	194
14.9	Philly Joe Jones off-beat triplet. Used with kind permission of Alfred Music.	195
14.10	Famous drum fills. Used with kind permission of Alfred Music.	198
14.11	“Billie’s Bounce,” w/stickings. Used with kind permission of Alfred Music.	200

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**Steven Schick** is a percussionist, conductor, and author who has commissioned more than 150 works, many of which are standard repertoire for percussionists. Schick founded the percussion group red fish blue fish – now celebrating its twentieth anniversary – and was the original percussionist of the Bang on a Can All-Stars. He is currently music director of the La Jolla Symphony and Chorus and artistic director of the San Francisco Contemporary Music Players. Steven Schick is Distinguished Professor of Music at the University of California, San Diego, and holds the Reed Family Presidential Chair in performance. He lives in La Jolla with his wife Brenda.

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**Jason Treuting** is a percussionist, composer, and improviser. As a member of Sō Percussion, he has performed internationally at venues such as Carnegie Hall and the Barbican Centre and has worked with a variety of artists including composer Steve Reich, maestro Gustavo Dudamel, *tabla* virtuoso Zakir Hussain, and indie rock gurus The National. As a composer, he has written most prominently for his own ensembles, contributing substantially to Sō Percussion's *Imaginary City* and *Where (we) Live*. His large-scale work *Amid the Noise* has been performed by ensembles worldwide. In 2013, Treuting was named a Princeton Arts Fellow and remains there as a performer-in-residence.

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Other contributors would also like to express their thanks to individuals who assisted them in preparing their chapters.

From Michael Schutz:

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# Introduction

RUSSELL HARTENBERGER

The *Cambridge Companion to Percussion* is a collection of articles that discuss issues relating to percussion and rhythm from the perspectives of performers, composers, conductors, instrument builders, scholars, and cognitive scientists. It is intended to be a companion to percussionists in their study and performance and an accompaniment to those who want a deeper understanding of percussion music and the rhythmic aspects that are embodied within it.

The *Companion* is not a historical documentation of percussion or an encyclopedia of instruments, terms, or usages. There are several excellent books and a growing number of journal articles and dissertations in these areas. It is also not a book on percussion technique, although the authors, all notable percussionists and percussionist/scholars, provide enlightened perspectives on performance issues. However, it is a valuable resource for students, amateurs, or professionals who seek insight into topics related to rhythm and percussion from experts in the field.

The percussion sphere is vast and worthy of a separate *Companion* in any of its areas. Consequently, for this volume I have chosen topics that will, hopefully, have wide interest and appeal and are from the points of view of Western-trained percussionists. The chapters are all written by percussionists whose backgrounds represent the range of interests commensurate with the breadth of the world of percussion.

The book is organized in broad areas, although there are overlaps throughout. Chapters 1 and 2 discuss the traditions of orchestral timpani and percussion from a historical perspective and also with a view to the future. Chapter 1 traces some of the “schools” of timpani playing that originated in European cities and have had an impact on percussion practice throughout the world. In Chapter 2, William L. Cahn, long-serving principal percussionist in the Rochester Philharmonic and later a member of its Board of Directors, cites issues that confront orchestral percussionists in the twenty-first century and possible solutions for them to consider.

Chapters 3–6 examine the development of percussion instruments and literature. In Chapter 3, marimba soloist and historian William Moersch writes about the rapid growth of interest in marimba and other mallet percussion instruments. The compositions, performers, and composers

listed in this chapter provide an extraordinary overview of the evolution of mallet instrument repertoire. In Chapter 4, percussionist and instrument builder Garry Kvistad analyzes the acoustical properties of percussion instruments and explains the value of this knowledge for percussionists. In Chapter 5, Rick Mattingly, Senior Publications Editor of the journal, *Percussive Notes*, provides insight into the percussion industry and the cross-over between manufacturers and performers. And in Chapter 6, scholar, composer, and Broadway percussionist Thomas Brett documents the history of drum machines and their effects on percussion and music in general.

Chapters 7–10 discuss percussion in performance areas that have emerged in the late twentieth and early twenty-first centuries. In Chapter 7, Adam Sliwinski, a member of Sō Percussion, looks at the percussion ensemble repertoire as chamber music from the early works of John Cage through the influential compositions of Steve Reich. Solo percussion performance is a relatively new phenomenon, and in Chapter 8, acclaimed soloist Colin Currie describes the solo and concerto repertoire for percussion while providing insight into the role of the percussion soloist. There is drama in the act of percussion performance, and in Chapter 9, Aiyun Huang, winner of First Prize and the Audience Award in the Geneva International Music Competition in 2002, describes the formalization of percussion theater through recent compositions. Percussionists often find themselves in the role of conductor, either formally or informally, and in Chapter 10, esteemed percussion soloist Steven Schick describes the challenges he faced in undergoing the transformation from professional percussionist to orchestral conductor.

In Chapters 11–13, three percussionist/composers describe their individual approaches to writing music for percussion and the concerns and issues that they have confronted in writing music in this idiom. Chapters 11 and 12 provide insight into the compositional styles of Bob Becker and Jason Treuting, two of the leading percussionist/composers of our time. There are many references throughout this book to the music and influence of composer/percussionist, Steve Reich. Chapter 13 is a collection of thoughts on percussion and rhythmic usage in Reich's music by the composer himself.

Three views of drum set playing are discussed in Chapters 14–16. In Chapter 14, legendary drummer Peter Erskine explains the elusive term “groove” and how drum set players achieve this feeling. In Chapter 15, Steven F. Pond, author of the award-winning book, *Headhunters, the Making of Jazz's First Platinum Album*, examines funk drumming through the frequently sampled drum break of Clyde Stubblefield. Drum set player and scholar Jeff Packman, in Chapter 16, describes technological

developments in the drum set itself, and the impact these changes have had on jazz and popular music.

Music played on percussion instruments is both the oldest and youngest of musical genres. The tradition of percussion exists in most countries in the world and has been a part of musical culture for as long as we know. The merger of these instruments and musical ideas has had a significant impact on contemporary Western percussion performance and is examined in Chapters 17–19. Chapter 17 is a conversation with the great *mrdangam* virtuoso from South India, Trichy Sankaran, and his daughter Suba Sankaran, both of whom have found ways to combine Indian and Western musical traditions. In Chapter 18, *mbira* player and African percussion pedagogue B. Michael William provides an overview of the influence of music from the African diaspora on many forms of music in the Western Hemisphere. In Chapter 19, percussionist/scholar Michael B. Bakan looks at the connections between percussion ensemble and Balinese gamelan and provides insight into a style of gamelan that uses only percussion instruments.

The perception of rhythm by humans is a relatively recent area of research by cognitive scientists. In Chapters 20 and 21, two percussionist/scientists look at some of the laboratory work that affects the way percussionists play their instruments and think about rhythms. In Chapter 20, Michael Schutz discusses the research on movement relevant to percussionists and focuses on those gestures that lack acoustical consequences. Chapter 21 concludes *The Cambridge Companion to Percussion* by bringing us back to the beginning of our relationship with rhythm in a discussion by John R. Iversen on the evolutionary origins of musical rhythm in humans.

My hope in presenting this volume is that it is representative of the growing significance of percussion and rhythm in Western music. Using the mantra of my first percussion teacher, Alan Abel, who instructed me to “follow the line” of the music, I encourage all readers who are inspired by the articles in this book to follow the many lines of percussion that lead to innovations in instrument development, composition, performance techniques, rhythmic ideas, and scientific research into future worlds heretofore unimagined.



PART ONE

## **Orchestral percussion**



# 1 Timpani traditions and beyond

RUSSELL HARTENBERGER

One whose insight is the same as his teacher's lacks half of his teacher's power. Only one whose insight surpasses his teacher's is worthy to be his heir.<sup>1</sup> LINJI YIXUAN (D. 866)

Timpani, or kettledrums, were the first percussion instruments to be included in the classical symphony orchestra, and the musicians who were called upon to play them were often string players, wind players, or, on occasion, singers. As composers wrote more complex parts for timpani, these newly minted timpanists began to create individual techniques based on their instruments, orchestra, repertoire, conductor, concert hall, and sociocultural environment. The players adapted to all these factors in creating individual approaches to sound production and musicality, and in doing so, became progenitors of the first schools of percussion. Orchestras in European cities spawned lineages of timpani players that, in some cases, still maintain links to their early timpanists through continuous teacher–student associations.

The first orchestral timpanists had no historical precedent for their playing techniques; the interpretation of their parts was based on their innate musicality combined with their imagination. As these musicians began to teach others the art of timpani playing, the techniques they developed became codified and, as time went on, even ossified as young players attempted to replicate the styles of their teachers. The timpanists who became the most influential were the ones who honored their teacher's precepts but responded to the changing musical environment by incorporating new ideas into their fundamental techniques. And as evolving generations of timpanists migrated beyond Europe creating family trees with branches extending in many directions, a cross-fertilization began to take place that enriched the use of percussion in Western musical traditions.

At the beginning of the twentieth century, orchestras were forming in major North American cities, and musicians from Europe were hired to fill many of the principal positions. The timpanists who arrived brought their traditions to their new orchestras but gradually modified them to accommodate orchestras with amalgamated groups of musicians playing in venues with different acoustics from the great concert halls in Europe. As percussion instruments gradually became

more commonly used in orchestras, the focus of timpani schools, in both Europe and North America, expanded to include snare drum, xylophone, glockenspiel, cymbals, and percussion accessories such as tambourine and triangle. Then, with the advent of recordings, theater orchestras, jazz and other forms of popular music, and later, compositions for solo percussion instruments and percussion/chamber ensembles, percussionists had career options beyond symphony orchestras. As a consequence, timpani became but one of many areas of focus for young players. Timpani styles began to merge as generations of percussionists moved from place to place and as creative players adapted to concert halls, new instrument designs, and diverse repertoire. However, the basic approaches to making a musical sound and interpreting a phrase that began with European timpanists continued to be valid and are still used by timpanists and percussionists today. One of the most intriguing stories of a European timpani tradition that found its way to North America and propagated an extended timpani and percussion lineage began in Leipzig, Germany.

### **Ernst Pfundt**

Ernst Gotthold Benjamin Pfundt (1806–1871) had some training on a variety of instruments, including timpani, in his youth, but he was a choral director, tenor soloist, and piano teacher when, in 1836, he was called upon to play timpani in the Leipzig Gewandhaus Orchestra. According to timpani scholar Edmund A. Bowles, the orchestra's conductor, Felix Mendelssohn, "became dissatisfied with the timpanist, Friedrich August Grenser (who doubled on second violin, a common practice in those days). During a rehearsal, Grenser had so badly bungled the drum and piano solo in the concluding moments of Beethoven's 'Emperor' Concerto that Mendelssohn . . . immediately hired Pfundt as a temporary replacement, who then performed so well that he earned Mendelssohn's everlasting gratitude." Pfundt became "arguably the most famous kettledrummer of his generation," and "wrote one of the very first instruction manuals for the instrument, thus establishing one of the first 'schools' of timpani playing."<sup>2</sup> Pfundt seems to have been a consummate musician from a musical background; he was the son of a singer, and nephew to Friederich Wieck, the father of Clara (later Schumann).<sup>3</sup> We can only speculate that, when Grenser "bungled" the timpani part to the Emperor Concerto, Pfundt was able to transfer his musical sensibility from singing and playing other instruments to timpani.

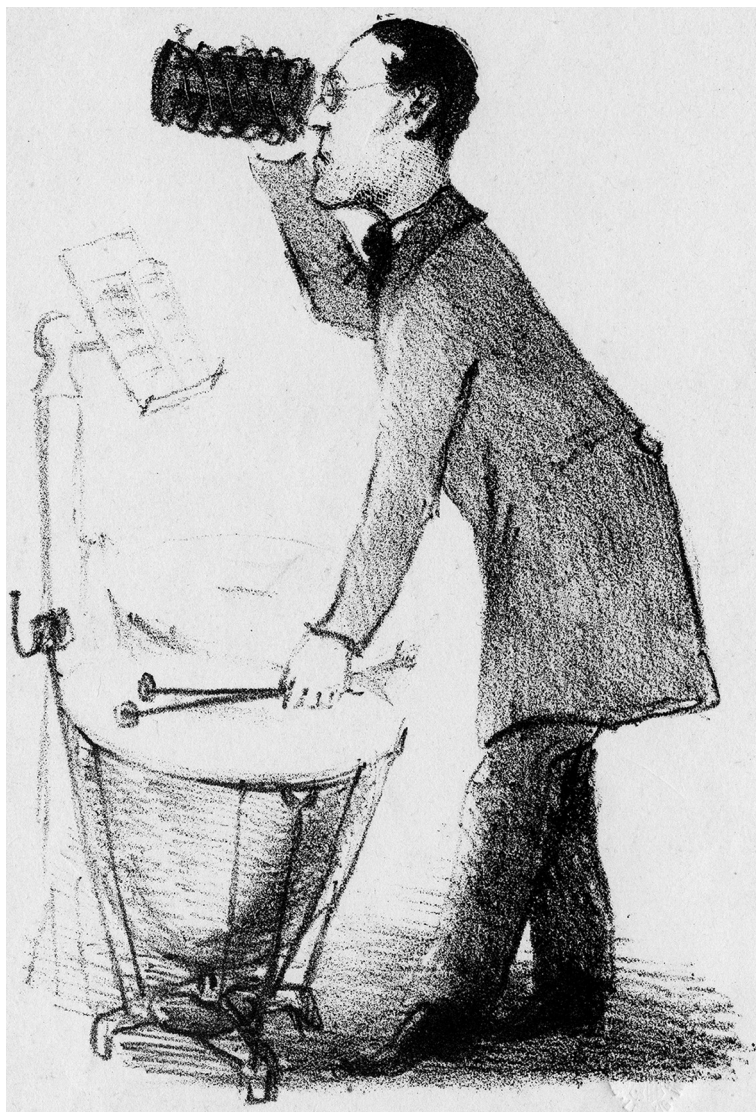


Figure 1.1 Drawing of Ernst Pfundt by Carl Reimers.

### **Alfred Friese; Saul Goodman**

The legacy of Pfundt and the school of timpanists in the Leipzig Gewandhaus Orchestra that followed him extends to some of the early timpani players in orchestras in North America. Alfred Friese was a violist in the Gewandhaus Orchestra who became interested in timpani and studied with Hermann Gustav Schmidt (1857–1926), the Leipzig timpanist from 1893–1923.<sup>4</sup> Friese earned a position as timpanist in the Winderstein Orchestra in Leipzig and later moved to the United States where he was

timpanist in the Philadelphia Orchestra, Pittsburgh Symphony, and the New York Philharmonic. It was in New York that Friese taught Saul Goodman, who eventually succeeded him as timpanist in the New York Philharmonic and played there from 1926 to 1972.<sup>5</sup> Even though Goodman studied with the Leipzig-trained Friese, he credits a German from Dresden, Oscar Schwar, with giving him important advice about timpani playing.

I owe a debt of gratitude to my dear friend and mentor, Oscar Schwar, the celebrated and unique timpanist of the Philadelphia Orchestra who died in 1945. Back in the late 1920s, I used to meet him every time the Philadelphia Orchestra came to New York City. Schwar had the most beautiful tone of any timpanist I have ever heard. With the encouragement and cooperation of Leopold Stokowski, he achieved tone colors from the timpani never heard before. He knew how to care for the instrument and how to keep it up to the highest state of perfection in order to produce the best results. In my many conversations with him, especially over a glass of beer, I learned much about these details that are so important for the timpanist.<sup>6</sup>

Goodman developed his own style of playing through his lessons and advice from Friese and Schwar, and also by playing from a position on stage at Carnegie Hall that Alan Abel describes as a “hot spot.”<sup>7</sup> From this acoustically live site, his sound projected into the hall with clarity and authority. Anthony J. Cirone, who studied with Goodman at the Juilliard School, says Goodman “constantly reminded his students about three important considerations when performing: precision, sensitivity, and musicality.”<sup>8</sup> Students of the “Goodman school,” sometimes referred to as the “New York school,” occupy numerous timpani and percussion positions in orchestras throughout the world, and the legacy of Goodman’s teaching still echoes from his “hot spot.”

## **Oscar Schwar; Cloyd Duff**

Oscar Schwar, who Goodman acknowledges as a mentor, studied violin as a boy in Bautzen, Saxony, and entered the Royal Conservatory of Dresden as a violinist. He switched to timpani and studied with Herr Heinemann, timpanist at the Dresden Royal Opera. After finishing his schooling, Schwar served as timpanist in orchestras in Finland and Russia before moving to the United States where he was timpanist in the Philadelphia Orchestra from 1903 until his death in 1946. He was the first percussion teacher at the newly created Curtis Institute of Music when it opened in 1924. One of Schwar’s students at Curtis was Cloyd Duff, who became timpanist in the Cleveland Orchestra in 1942 and played there until his

retirement in 1981. In an interview with Andrew Simco, Duff said of Schwar, “He was the most highly regarded player of his time. Even Saul Goodman studied with him.” In describing what Schwar was like as a teacher, Duff explained,

First of all, he scared the daylights out of me! He was a charming gentleman, but also a good, tough teacher. At that time I did not have a symphonic background but I gradually grew into his demands! I knew what he wanted, and he was always conscious of *tone* and *balance* . . . As Schwar taught mainly timpani, you had to know your percussion. Having been a rudimental drummer was good for me, as he was very much concerned with precision, as were most musicians of a German background.<sup>9</sup> [Emphases in the original]

Duff continued the Schwar legacy through his teaching at the Cleveland Institute of Music and the Oberlin Conservatory of Music where he trained generations of timpanists in the “Duff school,” or “Cleveland school,” of playing based on Schwar’s concepts of “tone and balance.”

### **George Lawrence Stone**

Even though Schwar taught mainly timpani, his concern for precision that Duff described carried over into other areas of percussion playing as the Dresden–Schwar school of timpani began to diversify with future generations of percussionists in North America. George Lawrence Stone (1886–1967) studied timpani with Schwar but followed a different path from orchestral playing. Stone was introduced to various percussion instruments at a young age by his father, who was a drummer, drum teacher, and drum manufacturer. After his father’s death in 1917, Stone became principal of the Stone Drum and Xylophone School in Boston. Stone started his musical life as a drummer, but he still felt the influence of a non-percussion instrument. In 1935, he published *Stick Control for the Snare Drummer*,<sup>10</sup> a book that is often referred to as the “drummers’ bible.”<sup>11</sup> It was patterned after the *Arban Trumpet Method* (1864), likewise known as “the Bible of trumpet players,”<sup>12</sup> and written by Jean-Baptiste Arban, a virtuoso French cornet player who studied and was later on the faculty at the Paris Conservatoire. Stone often used the *Arban Method* with his xylophone students,<sup>13</sup> and in 1949, published *Mallet Control*, a book in which he used some of the same pedagogical ideas that he outlined in *Stick Control*.

With the publication of *Stick Control*, Stone became much in demand as a teacher. His students included jazz drummers Gene Krupa, Sid Catlett, George Wettling, Lionel Hampton, Ted Reed, Joe Morello, as well as Vic Firth,<sup>14</sup> timpanist in the Boston Symphony from 1952 to 2001.<sup>15</sup> Firth said this about Stone:

He was probably one of the first technique builders of the teachers, and he felt it was terribly important to make music. His theory was that you can be a sculptor by virtue of owning a hammer and chisel, but you don't really sculpt anything until you have the technique to do it. Likewise, before you can do anything "shapely" in music, you've got to have the hands to do it with.<sup>16</sup>

One of Stone's students who certainly had "the hands to do it with" was Joe Morello, drummer with the Dave Brubeck Quartet (and another drummer who began his musical career on another instrument – in his case, the violin). In 1961, Stone published a sequel to *Stick Control* titled *Accents and Rebounds*, a book that incorporated some of Joe Morello's ideas about adding accents to the *Stick Control* exercises.<sup>17</sup>

Stone and his *Stick Control* book can also be credited with having an impact on the compositions of Steve Reich. Reich was introduced to the Stone book when he was a teenager taking drum lessons from Roland Kohloff, a young drummer in New York City at the time who attended Juilliard where he studied timpani with Saul Goodman.<sup>18</sup> The repeated patterns of the *Stick Control* exercises along with the effect created by the varied distribution of right and left hand in these patterns planted a seed in Reich's subconscious that would later surface in many of his works.<sup>19</sup>

## **William Street; Fred D. Hinger**

A contemporary of Stone's, and one of the most influential teachers of his generation, was William G. Street, timpanist in the Rochester Philharmonic and percussion teacher at the Eastman School of Music from 1927 to 1967. Street was a Canadian-born, self-taught musician who developed his own "school" of playing that utilized an upstroke concept.<sup>20</sup> John Beck, a student of Street's and his successor as percussion teacher at Eastman, wrote,

[Street] always stressed quality of sound regardless of the instrument being played or the volume. His idea of producing quality sound was through lifting the mallet, stick, or beater from the instrument. He would tell us never to hit into the instrument. "Play to the ceiling – not the floor . . . you must be aggressive to play percussion, but not offensive." He also stressed relaxation as a major point in producing sound. Musical phrasing was always paramount in his teaching and playing. He believed that snare drum, timpani, and marimba were all capable of producing a musical line.<sup>21</sup>

One of Street's students at Eastman was Fred D. Hinger (1920–2001), a musician who combined musical ideas from string players, wind players, as well as percussionists in developing his unique approach to timpani. Hinger was timpanist in the Philadelphia Orchestra from 1951 to 1967



**Figure 1.2** William G. Street (1895–1973), oil on canvas (2004) by Sari Gaby.

and in the Metropolitan Opera Orchestra from 1967 to 1983. After graduation from Eastman and a stint in the US Navy Band as percussionist and xylophone soloist, Hinger joined the Philadelphia Orchestra in 1948 as principal percussionist. Oscar Schwar, having died only two years earlier, was still a legend among conductors and fellow musicians in the orchestra, and Hinger absorbed as much information from them as he could about Schwar's timpani style. When Hinger was appointed to the timpani position in 1951, he combined Schwar's style of playing with his own ideas about sound and musicianship.

Hinger was a throwback to the nineteenth-century German timpanists who also played other instruments. At Eastman, he minored on violin in his music education degree program. He later adapted bowing techniques to hand patterning on percussion instruments, devising a system of arm



Figure 1.3 Fred D. Hinger, portrait (1966) by Shirley Hinger Corbett.

movement he called “time in motion.” While in the Philadelphia Orchestra, Hinger studied the ideas of phrasing and musicianship from two of his colleagues, principal flutist William Kincaid and principal oboist Marcel Tabuteau, and transferred these concepts to timpani.

Kincaid and Tabuteau were both products of French woodwind players. Kincaid was a student of Georges Barrère at the Institute of Musical Art (the original name of the Juilliard School) in New York City. Barrère, who was born in Bordeaux, attended the Paris Conservatoire before becoming the principal flutist in the New York Philharmonic. Tabuteau, born in Compiègne, France, was a protégé of Georges Gillet at the Paris Conservatoire before moving to the United States to play oboe in the New York Symphony Orchestra and later with the Philadelphia Orchestra. Both Kincaid and Tabuteau taught at Curtis and are credited not only with populating North American orchestras with their students but with helping to develop a sound in these orchestras that differed from that of European orchestras and became known as the American orchestral sound.<sup>22</sup>

Kincaid’s teaching techniques and words of wisdom were assembled by one of his students, William Krell, in a book titled *Kincaidiana*. Some of the aphorisms attributed to Kincaid in this book are similar to advice Hinger gave to me when I was a student of his at Curtis from 1962 to 1966:

You never really learn anything until you can forget it.

Articulation is the pronunciation of musical sound.

Swirls [of notes] will sound faster if the notes are evenly distributed rather than faked through as a smear of sound.

Thoughtful repetition is the key to facility.

Music . . . is sound in motion and is immediately involved with the progression of time.

The important consideration is not having the *right* plan, but having *a* plan.

Happily, there is no *one definitive* solution to a phrasing problem; rather, there are *several definitive* solutions with the validity of each depending upon the personal frame of reference and the conviction with which it is executed.<sup>23</sup>

[Emphases in the original]

Tabuteau became well known for his woodwind class at Curtis in which he discussed his ideas of phrasing and musicianship. The class was open to other musicians and Hinger took advantage of this opportunity to attend some of them. One of Tabuteau's pedagogical techniques was a number system used to teach the principles of phrasing. Laila Storch, a student of Tabuteau's at Curtis, described his number system this way in her diary entry of April 1, 1943:

[Tabuteau] was explaining something about this new, original system of his – says it would revolutionize the whole foundation and conception of music and that it is what makes his playing sound *different*– that everyone imitates him, but they don't know the secret so they don't sound the same. It is all based on numbers and when you know that, you can actually hear it when he plays. You can hear 1, 1–2, 2–3, 3–4 as plain as day. Every note is placed exactly at a certain spot as if on a micrometer. It seems to me it would take almost a superhuman accuracy and perfection to play like that and you'd think anything so calculated and mathematical would sound cold and dry, but it certainly doesn't the way he does it. He'll have me play five notes over and over to get just the right impulses . . . I think his system of thinking of notes by numbers . . . would put a very solid foundation under everything you do and would keep your playing from sounding aimless and pointless.<sup>24</sup>

[Emphasis in the original]

One of the categories of Tabuteau's numbering system as listed by David McGill in his book, *Sound in Motion*, is what he calls "Motion Numbers," and is Tabuteau's best-known use of numbers. A sequence of four sixteenth-note groups without using Tabuteau's phrasing would be counted 1234 1234 1234 1234.

The same grouping of four sixteenth-notes with Tabuteau's phrasing and number system would be counted 1,123 4, 123 4, 123 4, 123 4.<sup>25</sup>

Hinger adapted Tabuteau's number system to percussion playing, and used stickings to create shadings of phrase. He may have begun thinking about the relation of stickings to phrasing when he was a student of Street's

**Example 1.1** Four sixteenth-note groups without Tabuteau phrasing.



**Example 1.2** Tabuteau motion numbers to demonstrate forward motion.



at Eastman. According to Bob Becker, who also studied with Street, one of Street's mantras was, "Stickings are the music of the snare drum."<sup>26</sup> At the core of Hinger's approach to sticking and phrasing was that an audible difference existed between two notes played by alternating hands and two notes played by the same hand. Hinger described the difference this way: "Because of the varying strengths and weaknesses of either hand, each hand holding a stick actually plays a different pitch or timbre. It can be difficult to match these pitches. The differences, though, however slight, can be used for phrasing."<sup>27</sup>

He also felt that if a repeated attack in a rhythmic pattern was played by the same hand, the time-space between the two attacks would be ever so slightly larger than the time-space between two attacks that were played by alternating hands. In order to create the separation between attacks indicated by repeated numbers, Hinger used "doublings," or consecutive attacks played by either the right or left hand. He used a doubling as a way to lead into ends of phrases, to begin phrases with impetus, and to create space while moving from drum to drum in certain musical excerpts. Hinger advocated experimentation with doublings when playing consecutive note groupings. His theory was that a doubling anywhere in a consecutive note group would break up the back-and-forth feeling of alternating strokes and add life to the phrase. Tabuteau's numbering indication of four sixteenth-notes followed by a downbeat would be 1123 4. Hinger's doubling for the same example would be RRLR L. Using this doubling principle, a doubling with the right or left hand creates a separation, whereas alternating strokes give a sense of forward motion.

Hinger's inquisitiveness led him in many different directions as he experimented with techniques and ideas that could be applied to timpani playing. After discovering the book *Zen in the Art of Archery*, by Eugen

Herrigel, he took up archery to better understand the philosophy of Zen. Hinger compared the act and art of striking a timpani head to a Zen archer's relationship with his target as described in the introduction to the Herrigel book by Zen Buddhist philosopher D. T. Suzuki:

In the case of archery, the hitter and the hit are no longer two opposing objects, but are one reality. The archer ceases to be conscious of himself as the one who is engaged in hitting the bull's-eye which confronts him. This state of unconscious is realized only when, completely empty and rid of the self, he becomes one with the perfecting of his technical skill, though there is in it something of a quite different order which cannot be attained by any progressive study of the art.<sup>28</sup>

In adapting this concept to timpani, Hinger developed his theory of "resistance." In his book *Technique for the Virtuoso Timpanist*, he described it this way:

Over the years of my professional life, I have been striving for a system of playing that compliments [*sic*] the methods used by other instrumentalists and have come to the conclusion that all players are faced with a common problem, one of resistance. Resistance is provided partially by the instrument and partially by the performer himself. It can be quite obvious that each instrument provides a physical resistance, but the resistance that the performer provides is a very personal one and requires a great deal of analysis.

The percussion instruments are the only ones not in contact with the player before the instruments are vibrated. Therefore, it can be difficult to relate the resistance of the instrument to the resistance of the player. There *must* be a balance between the resistances, or, the mental–aural picture that the player must "presuppose" will emerge distorted and the resultant sound will be uncontrolled. A very definite theorem must be correlated at this point concerning desired sound. "*The kind of sound that is desired by the player is determined by the length of time the mallet is on the vibrating body.*" This "self-resistance" allows for musical control . . . <sup>29</sup> [Hinger's emphases]

Hinger was aware of his percussion predecessors, and frequently spoke of the American rudimental drummer Sanford A. "Gus" Moeller (1886–1960), who was a contemporary of George L. Stone. Moeller is another example of a percussionist who began on another instrument, in his case the piano. He wrote a well-known book titled *The Moeller Book: The Art of Snare Drumming*, in which he considered drummers to be students of eurhythmics. Hinger studied eurhythmics at Eastman and often made reference to this pedagogical method in his teaching in order to demonstrate his "time in motion" ideas.

In addition to using some of the eurhythmic techniques of rhythm and movement espoused by Moeller with his students, Hinger required them to read a page in the Moeller snare drum method titled "Confidence." Part of

the reason for this requirement was to emphasize to students that no single way of playing percussion or no single teacher could lead the way to success, and that it was up to each individual student to explore and draw from as many sources as possible. In his essay, Moeller states,

No success can be obtained without confidence. This holds good in drumming . . . a drummer needs confidence in his ability and schooling to accept a prominent position . . . He may go to some drummer more or less known and throw himself on his mercy, give him money and follow his teachings minutely and still be found fault with. Sooner or later he will become aware that no one drummer knows it all or has invented any new system that all bow to. He will seek the truth from all sources until he has that confidence in himself that criticisms run off like the water from the duck's back . . . Soon his reputation will precede him and he is the censor and not the censored.<sup>30</sup>

Like many of the other teachers who generated schools of playing, Hinger was a strong advocate of students finding their own way of playing. Both he and Moeller would certainly have endorsed the saying from Linji Yixuan at the beginning of this chapter.

## Conclusion

The transition from Leipzig, Dresden, and other European timpani traditions to the twenty-first-century view of percussion could be summarized by a quote from *New York Times* critic Allan Kozinn: “If you think about it, drums are the new violins.”<sup>31</sup> The influence of violins and other instruments on percussion has come full circle from the days when Pfundt was plucked from his position as choral director at the Leipzig City Theater to perform the Emperor Concerto timpani part with the Gewandhaus Orchestra. Percussion is the focal point for much contemporary music, and percussionists now have successful careers as soloists, chamber musicians, composers, and conductors. However, the musicianship that began with the early timpani schools, and the principles of “tone and balance,” “precision, sensitivity, and musicality,” creating a musical line, and performing with confidence are still cornerstones of the timpanist’s art.

Timpani, more than any other orchestral percussion instruments, are firmly entrenched in the canon of Western classical music, and the traditions of timpani playing that originated in Leipzig, Dresden, Vienna, Amsterdam, Paris, London, and other European cities established the foundation of timpani sound and technique. This association that timpani playing has with the historical while residing in a progressive age makes it imperative that contemporary timpanists use

their imaginations in interpretation of their parts. David Kent, long-serving timpanist in the Toronto Symphony Orchestra, wrote in his book *Timpani Playing in the 21st Century*, “In the end . . . the determining factor in anything related to playing music should be the way in which it actually sounds.”<sup>32</sup> My North Indian *tabla* teacher, Sharda Sahai, who came from a long tradition in the Benares *gharana* of *tabla*, expressed a similar sentiment when I questioned him about the accompaniment patterns I should and should not play on *tabla*. He admonished me by saying, “You can do anything as long as it’s beautiful.” The same can be said to aspiring young timpanists. It is important to honor tradition, but equally important to embark on new adventures in music-making as long as you have an understanding of what makes music sound beautiful. Ernst Pfundt used that approach in 1836, and it is still an appropriate attitude today.

### Notes

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2. E. A. Bowles, “Mendelssohn, Schumann, and Ernst Pfundt: A Pivotal Relationship between Two Composers and a Timpanist,” *Journal of the American Musical Instrument Society*, vol. 24 (1998), 7–9. Pfundt’s instruction manual is *Die Pauken* (Leipzig: Breitkopf und Härtel, 1849).
3. *Ibid.*, p. 7.
4. According to Tom Greenleaves, one of the current principal timpanists with the Gewandhaus Orchestra, there is no record of Schmidt having studied with Pfundt; however, Schmidt did augment Pfundt’s timpani method with a snare drum tutor in 1894. So it is very likely that Schmidt played timpani in much the style of Ernst Pfundt. (Greenleaves, email communication, November 12, 2013).
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6. S. Goodman, “Timpani Talk,” *Percussionist*, vol. 17, no. 3 (June 1997), 103–4.
7. A. Abel, personal interview (Philadelphia, PA, October 16, 2012).
8. A. J. Cirone, “Portraits in Rhythm Newsletter,” N1, www.anthonycirone.com.
9. A. Simco, “An Interview with Cloyd Duff,” *Percussive Notes*, vol. 31, no. 3 (February 1993), 56–7.
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11. R. Mattingly, “George Lawrence Stone,” *Percussive Notes*, vol. 35, no. 6 (December 1997), 10–11.
12. B. Chidester, “Arban Trumpet Method – What Is It?” *The Trumpet Blog* (October 7, 2013). Arban, in turn, was supposedly influenced by the virtuosic technique of violinist Niccolò Paganini.
13. Mattingly, “G. L. Stone,” 10.
14. Vic Firth was another timpanist who began his musical studies on instruments other than percussion and who generated his own school of timpani playing. He first studied cornet with his father, a successful trumpet and cornet player, then studied trombone, clarinet, piano, and percussion. In addition to holding the principal timpani position in the Boston Symphony for forty-nine years and founding his own percussion products company, he has been on the faculty of the New England Conservatory since 1950. J. Strain, “Hall of Fame: Vic Firth,” *Percussive Notes*, vol. 33, no. 4 (August 1995).
15. Mattingly, “G. L. Stone,” 11.
16. *Ibid.*, p. 11.
17. *Ibid.*, p. 11.
18. Roland Kohloff was timpanist in the San Francisco Symphony from 1956 to 1973. He then succeeded Saul Goodman as timpanist in the New York Philharmonic where he played from 1973 until his retirement in 2004.
19. S. Reich, personal interview (New York City, December 18, 2003).
20. According to John Beck, Street developed this technique after hearing a

- xylophone recital by Japanese soloist, Yoichi Hiraoka. Personal communication (Rochester, NY, May 4, 2012).
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26. B. Becker, *Rudimental Arithmetic: A Drummer's Study of Pattern and Rhythm* (Asbury Park, NJ: Keyboard Percussion Publications, 2008), p. 54.
27. F. D. Hinger, *Time & Motion: The Musical Snare Drum* (New Haven: Cornucopia Music, 1991), p. 16.
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## 2 **Orchestral percussion in the twenty-first century**

### Concerns and solutions

WILLIAM L. CAHN

#### **Introduction**

A professional percussionist in a symphony orchestra occupies one of the special areas of human endeavor capable of providing a lifetime of fulfillment. It is truly wonderful to have the opportunity to engage on a regular basis with music created by some of the greatest minds of Western civilization (and increasingly of Eastern civilization as well). It can also be highly fulfilling to be regularly immersed in the glorious sound of an orchestra and to have acquired the ability to listen deeply and be touched by orchestral music. For those percussionists who have a “love” of orchestral music, it can be as much of a privilege to sit quietly through three movements of a symphony in order to play the one (and only) cymbal sound in the middle of the fourth movement as it is to play a challenging xylophone solo passage in a contemporary piece that requires many lonely hours of practice.

There are a number of attractive aspects to playing in an orchestra that are unique to percussionists. There is a certain directness and visceral clarity for audiences in connecting the physical motion of a percussionist striking an instrument with the immediacy of the sound produced. Except for the conductor, the percussionists are the most visually accessible performers seen by audiences due to their physical movement around instruments within the percussion section. In addition, percussionists, perhaps more so than other instrumentalists, have a considerable degree of freedom in the selection of sounds to be produced for any particular passage in the music. To non-percussionists a triangle is a triangle, but to percussionists the term “triangle” implies a fairly wide spectrum of instrument possibilities from a small triangle with a high clear-pitched sound to a larger triangle with a lower-pitched sound that is rich in overtones. It is in the selection of sounds that each percussionist displays an individual musical voice, and only rarely will a conductor ever challenge a percussionist’s choice.

Of course, to become a professional orchestral percussionist, one must first make a significant commitment to learn to play a variety of percussion instruments at the highest technical level, and then to learn the standard orchestral repertoire in order to become acquainted with the generally

accepted performance practices. However, while playing on percussion instruments can in itself be a reliable source of enjoyment for the player, that pleasure alone may not be enough to sustain a sense of fulfillment throughout a career. In the long run, the decision to devote one's professional life to orchestral music will likely be most fulfilling when motivated as much by the enjoyment of listening to orchestral music as by playing it. That being said, the question becomes, "what kinds of concerns will percussionists face in the years ahead?"

### **Constant improvements in the standard orchestral percussion instruments**

There has been a steady growth in the variety of traditional orchestral percussion instruments available in the marketplace worldwide. Percussionists in the twenty-first century have easy access to dozens of triangle manufacturers, and the same is true for tambourines, snare drums, and virtually every kind of percussion instrument. The number of varieties will only continue to grow. At the same time, as the number of instrument options is increasing, there will also be regular innovations in design, construction, and materials used for the standard orchestral percussion instruments. It would not be unreasonable for percussionists in the future to see timpani with built-in automatic electronic tuning mechanisms, snare drums with devices to automatically turn snares off and on, new materials for drumheads, or various extended-range keyboard percussion instruments with bars made from new materials.

This virtual explosion of instrument options and innovation has already had an impact. For example, until the late 1950s, the only option available for timpani heads was calfskin. But since then, as new materials have become available and as the skills of tanners gradually went the way of the blacksmiths – they were no longer needed – the generally accepted timpani sound quickly shifted to various types of synthetic plastic heads. Of course, there will continue to be die-hard advocates for calfskin heads because of their distinctive sound characteristics. These players must be willing to endure the added efforts needed to maintain them in performance-ready condition in differing indoor and outdoor environments.

Most orchestras own a standard set of four timpani, but it is not unusual for timpanists, especially in the larger-budget orchestras, to own one or more personal sets. The acceptable standard for timpani has gradually shifted, especially in North America, to the Dresden style (with ratchet or hydraulic tuning pedals and all mechanics placed outside of the suspended copper bowl) from the American style (with spring

counterbalanced pedals and some of the mechanics placed inside the bowl). The timpanist also has options for the shape of the copper bowls, which has an effect on the “brightness” (presence of overtones) or “darkness” (absence of overtones) of the sound.

Snare drums have also undergone an evolution. Percussionists are normally required to provide their own snare drums, and they have dozens of manufacturers and style options from which to choose. Along with this steady growth of options comes the need to remain informed and current. For each piece in the orchestra repertoire, snare drummers have the freedom to determine which type of snare drum and sound they will use; among their options are shell depth, thickness and material of the shell, number and type of tension lugs, calfskin or plastic heads, amount of tension on the heads, completely open or partially muted, single snare type or multiple-material snares, and so on.

Percussionists have a similar field of options and the same expanding degrees of freedom with bass drums, although along with these options comes a responsibility to constantly maintain the instrument in performance condition. As with the timpanist, this responsibility regularly requires some extra time in advance of rehearsals and performances. For this reason, some orchestras designate one of the section players to be the regular bass drummer who must be committed to clearing and tuning the bass drum heads as well as removing the regularly occurring unwanted rattles and noises from the drum’s hardware or suspension cradle. Normally, bass drums are owned by the orchestra, but it is not unusual, especially in the case of designated bass drummers, for percussionists to have personal instruments. The accepted standard for bass drums has also evolved from large-diameter, Turkish-style (head diameter greater than shell depth) drums with calfskin heads, to smaller diameter, Scottish-style (shell depth equal to or greater than head diameter), ribbed-plastic bass drums. Some European orchestras prefer to use a “gong” bass drum – single headed and highly tensioned.

Usually, it is the orchestra percussionist’s responsibility to provide most of the standard small percussion instruments – cymbals, triangles, tambourines, wood blocks, castanets, and more. Some of the widely used books on orchestration define cymbals and triangles as non-pitched percussion instruments. Actually, that description is only half true. Both instruments, and in fact most percussion instruments, do have a fundamental pitch. In the case of cymbals and triangles, the fundamental pitch, which is mostly audible only after the overtones have faded away, is ignored in favor of the characteristic strike sound, which is rich in overtones that mask the fundamental pitch. As composers gradually become aware of the pitch aspect of percussion

instrument sounds, it is likely their writing will be affected in the same way that using a double-bass bow to produce sustained sounds on cymbals and triangles has become ubiquitous over the last few decades. There are compositions already in existence that require percussionists to produce certain specific pitches when bowing a cymbal. Obviously, this also requires that the percussionist obtain a cymbal with an overtone array capable of producing the specific pitch.

Another standard orchestral percussion instrument, the tambourine, has witnessed the development in recent years of a variety of nontraditional performance techniques influenced by frame drumming practices common to non-Western music genres. Composers have also explored the use of multiple tambourines having jingles with relative pitch differences – high, medium, low. As implied above, it is even possible to compose for specific pitches of a tambourine’s jingles. Of course, such a requirement would necessitate that percussionists seek out and obtain the instruments that are appropriate to the part, an effort made considerably easier with the resources of the Internet.

Most woodblocks, temple blocks, and even castanets are clearly pitched, although as with most writing for percussion instruments, the pitch of the instruments is not normally considered. Rather, the interest is focused on their “tone color” quality. Innovations in design, materials, and production have made it possible for percussionists to select from a variety of available instruments, either traditionally wooden or newly synthetic, in order to meet the requirements of the music.

In some of the orchestral repertoire the terms, “gong” and “tam-tam” are used interchangeably, when actually these two instruments, which may appear to be similar visually, are different in their characteristic sound. The term “gong” technically refers to a metallic (bronze) disc or pan that is shaped by casting and/or hammering to produce a specific pitch, with relatively little overtone presence in the overall sound. A “tam-tam” is a metallic disc too, but technically, its sound is characterized by a strike tone having a rich spectrum of overtones, including some “white noise” (virtually all overtones within a portion of the frequency spectrum). Tam-tams do have a fundamental pitch, but as with cymbals, that aspect of their sound is generally irrelevant for most of the orchestra repertoire. Tam-tams are normally owned by the orchestra although they, as well as pitched gongs, are frequently obtained from percussion instrument rental services for specific pieces. The principal percussionist is usually responsible for locating any needed instruments, while the orchestra covers the rental charges.

In contrast to the performance skills required of percussionists in the past century, orchestras now require that all members of the percussion section,

not just one or two dedicated members, have a high level of skill on the standard keyboard percussion instruments, the xylophone and glockenspiel. Contrary to the relatively short passages for these instruments that exist in most of the repertoire composed prior to the 1960s, it is not unusual for these instruments to have extended and highly technical parts in contemporary compositions. In addition, the standard ranges of both of these instruments have expanded from 3.5-octaves to 4-octaves for xylophones and from 2.5-octaves to 3-octaves for glockenspiels. While in most instances orchestras own these instruments, percussionists may also choose to use their personal instruments, especially if their instrument is a highly regarded vintage xylophone (e.g., Deagan Artists Special) or glockenspiel (e.g., Deagan Parsifal Bells).

Another consideration for the keyboard percussion instruments is the tuning of the bars. In recent years, it has been an acceptable practice for xylophones and glockenspiels to be tuned slightly higher (A=442) than the standard orchestra tuning (A=440). Some players prefer that only the upper octave of the instrument be tuned high, but when instruments need to be retuned, it is almost always the principal percussionist who determines the tuning. Percussionists should also take into account that while xylophones in North America and Japan are usually quint-tuned (with a predominant second-harmonic overtone – an octave and a fifth above the fundamental pitch of each bar), European xylophones are commonly octave-tuned (with a predominant third-harmonic overtone – two octaves above the fundamental). This can be a significant factor for orchestra percussionists to consider when touring, because there is a noticeable difference in the sound quality between these two tuning systems.

In recent years, there has been a rapid expansion of the technical requirements for performance on two other keyboard percussion instruments, the marimba and the vibraphone. While the xylophone and glockenspiel have essentially been limited to orchestra repertoire that is playable with two-mallet techniques, the marimba and vibraphone have both had a renaissance due to the worldwide interest among percussionists and composers in four-mallet techniques, particularly the performance capabilities made possible using the mallet grip (with two mallets in each hand) developed by Leigh Howard Stevens in the 1970s.

### **Gaining access to new generations of acoustic and electronic percussion instruments**

The expansion of orchestral repertoire, including not only symphonic music but also opera, pops, and other non-symphonic genres, increasingly requires

that members of the percussion section perform on nontraditional instruments and produce novel or unusual sounds. Global communications, travel, and trade have made it possible for composers to write for instruments from non-Western cultures. As the world's percussion instruments become more widely known and obtainable, composers are writing for increasingly large percussion sections. At the same time, percussionists and inventors are continually creating new kinds of percussion instruments and sounds. In addition, electronic instruments that generate, modify, and amplify sounds are finding creative applications in both standard and recently composed orchestral works. It is increasingly important that orchestra percussionists know how and where to find the instruments required by the repertoire.

The problem of gaining access to unusual percussion instruments is now addressed by companies that offer instrument rental services. These companies are usually located in major metropolitan areas and they serve as a central resource, where percussion instruments can be obtained, transported, stored, and maintained in good playing condition. These tasks, because of the expense and time involved with the ever-increasing array of percussion instruments, have become too costly for many percussionists to do on their own. Companies that rent percussion instruments can be located easily on the Internet.

Another source of percussion instruments that has seen growth in recent years is catalog sales. Along with the simultaneous growth of Internet-marketing, instruments which in the past might have taken weeks of effort to locate can now be found and purchased with a few strokes on a computer keyboard or other digital device. As orchestra budgets continue to tighten, the responsibility to purchase instruments needed for any particular piece could fall on the orchestra's percussionists themselves. It should be noted that pre-owned/used instruments can frequently be found on the Internet at prices much lower than in catalogs or from retailers. Orchestras that are located near music schools and universities may have access to high-quality instruments on a loan basis.

### **Embracing new performance techniques, styles, and technologies**

Having obtained the required instruments, orchestra percussionists may on occasion need to develop their own individual techniques in order to obtain acceptable sounds on unfamiliar instruments. This might mean performing on standard orchestral percussion instruments in nontraditional ways, for example, by playing specific pitches on a bowed cymbal or by scraping a drumhead for a specific sound. It might mean learning some

traditional techniques used by non-Western percussionists on instruments associated with African, Asian, Brazilian, Indian, or other non-Western music. And, it might mean developing an understanding of ways to use electronic instruments in a performance environment such as placement of microphones and speakers, sampling techniques, and electronic sound modification techniques. Fortunately, there are a growing number of opportunities to obtain information through the Internet, from colleagues (one's network), and more deeply through workshops, seminars, and evening or summer courses offered by music schools and universities.

Staying current with new developments, particularly regarding rapid advances in digital technologies, will certainly continue to present challenges to the percussionist's workload. Advances in digital sound production will continue to improve the ease with which any sound can be electronically reproduced in real-time performance, with the performer/percussionist having virtually as much control over the sound as with any acoustic instrument. The devices that make this possible will continue to become more responsive to real-time spontaneity in performance thanks to newer generations of software that allow the performer to be intuitive and flexible. For percussionists, the entire spectrum of sound effects – natural acoustic sounds, electronic sounds, or any combination of sounds that can be imagined – will be only a keystroke away in performance.

Digital technologies and the Internet will also continue to improve the ease with which percussionists can gain access to orchestra scores, printed parts, recordings and performance practices; the value of these resources to musicians is immeasurable. The Internet also makes it possible for percussionists to obtain information easily through blogs, chat rooms, and direct contact with other percussionists worldwide.

### **Preparation of percussion parts**

One of the biggest challenges facing percussionists in contemporary music, especially in contemporary music scored for a large percussion section, is dealing with page turns in parts that are frequently in score form, with all of the percussion parts lumped together. In this scenario, a single page may contain only a few bars, requiring frequent and virtually impossible page turns. Unlike solo pianists, percussionists cannot expect to have dedicated page turners, though it might be possible on rare occasions for one percussionist who is momentarily available to turn another percussionist's page. Sometimes cloned parts are required simply to avoid the need for a percussionist to pick up a part to carry it to another location within the percussion section, and occasionally it is necessary to enlarge a cloned part

so that it can be read by a percussionist on a distant instrument. Generally, it will be the principal percussionist's responsibility to insure that all of the players in the percussion section receive individual parts that clearly indicate which instruments and passages they must play. However, the individual players still have the ultimate responsibility to see that their own part is in order. The parts must have reasonable page turns and be "cleared" of any unwanted markings from previous performances. Even in situations where parts are used from previous performances by the same orchestra, the number of players in the percussion section may be different, requiring a reassignment of instruments or passages. Generally, the principal percussionist will work with the orchestra librarian to address such problems.

Fortunately, the technological advances in photocopying and scanning have enabled easy duplication of printed materials so that each player can have a dedicated clone part that can be yellow-highlighted to clearly indicate that player's assignments. Another option, when appropriate, would be to make clone copies of parts that can then be cut-and-pasted for each individual player. On rare occasions, it may even be necessary for a percussionist to hand-copy or type out on a computer and print a specific percussion part. The use of tablet computers and digital screens in place of printed parts has already been done effectively, and such uses will likely continue and expand.

### **Embracing the increasing influence of digital music**

It has become possible for anyone anywhere in the world to access free websites such as YouTube on the Internet and to view performances that were originally video-recorded in virtually every video technology since video-recording became possible. In addition, the potential exists for the Internet ultimately to provide easy access to almost every audio recording that has ever been made and preserved. Newer digital technologies are certain to be developed in the future that will enable continual improvements in the quality of sounds and images. For music students and professionals at all levels, this development will prove to be a valuable resource for the study of performance practices in the same way that early audio recordings were in the early twentieth century. At the same time, having easy access to an ever-higher quality of audio and video-recorded performances may very well prove to be an attractive alternative to attending live performances, luring listeners away from live concerts.

To address these developments, orchestras and their musicians will have to find innovative ways to attract audiences by emphasizing the

strengths of live performance over recorded performances, while at the same time rethinking some of the formal aspects of the traditional concert model – format, content, dress, concert length, pre- and post-concert talks, visual enhancements, and so on. To some extent, the Metropolitan Opera has already demonstrated some success with its live broadcasts that are digitally streamed to local theaters throughout the world. Orchestras will have to find ways to connect with younger audiences digitally in response to the worldwide expansion of social networking. Methods will have to be found for orchestras to use digital media cost-effectively in order to get their messages distributed and heard regularly.

### **Solving problems**

As in the past, percussionists, orchestral and otherwise, will continue to be problem solvers as they have always been, taking advantage of available resources. They will surely continue to be challenged to invent the means necessary to satisfy the requirements of the music in varying performance scenarios, through creative substitutions of instruments, self-directed playing techniques, or creative ways of suspending, positioning, and striking percussion instruments.

A serious problem exists today in rethinking what the job of an orchestra musician actually entails in an evolving digital environment with shifting social values. It has been said that it takes musicians just as many hours to prepare a Beethoven symphony today as it did in Beethoven's time. That is true, but today's environment also requires that in addition, orchestra musicians, especially in the smaller orchestras, need to have a "big picture" understanding of the forces that make orchestras viable – for example, social values, markets, economics, and finances.

### **Acquiring "big picture" skills**

In order to sustain orchestras financially and to maintain the relevance of orchestras within their communities, it will become increasingly important for musicians, especially professional symphony orchestra musicians, to become as well informed as possible about virtually every aspect of their orchestra's business by acquiring (or at the very least, by understanding) certain basic business skills in addition to the high level of performance skills that they are normally required to maintain. Among the basic skills

that would prove to be of significant value to orchestra musicians in sustaining their careers and their orchestras are the following:

Leadership Skills	presenting a positive and supportive attitude to others, including colleagues, audiences, business associates (orchestra staff), and media <i>This is managing.</i>
Listening Skills	accurately assessing the effects of one's actions on others, including colleagues, audiences, and supporters, by asking the right questions and listening to the responses <i>This is marketing.</i>
Advocacy Skills	developing writing and public speaking skills in order to help others to better understand and appreciate the value of the music <i>This is promotion.</i>
Financial Skills	understanding and using budgets, accounting, and financial analysis <i>This is financial management.</i>
Funding Skills	understanding successful strategies to obtain financial support <i>This is development.</i>

These additional skills can be acquired by means of regularly scheduled professional development workshops and seminars presented by local or national business and arts professionals, managers, financial officers, publicists, marketers, and so on. In an ideal world, such workshops would be structured as paid services for orchestra musicians. Business understanding and skills might also be acquired through self-directed reading and study or through formal courses offered by schools and colleges.

### **Embracing alternative orchestra models**

The ongoing struggle of the major symphony orchestras in trying to preserve their traditional models of presenting full seasons of formal concerts of Western symphonic music performed by a full-time staff of professional musicians will continue. But an increasing number of orchestras, especially those with shorter seasons and smaller budgets, will have to embrace new models in serving their communities in conjunction with the need to remain financially viable. The ever-increasing financial squeeze, especially for orchestras in communities outside major population centers, will necessitate a rethinking of the nineteenth- and twentieth-century orchestra model as orchestras try to remain relevant within their communities through expanded pops and educational programming. If costs

continue to rise faster than revenues, more orchestras may be forced to move toward a “pay-per-service” model (a number of orchestras have already done so), thereby eliminating fringe benefits and reducing the job security of their professional musicians. This model would also increase the necessity for musicians to acquire the broader sets of performance and business skills described above in order to preserve their financial viability.

In a pay-per-service orchestra model, percussionists may be required to take on responsibilities such as providing, transporting, maintaining, and storing percussion instruments, assigning and/or preparing their own individual parts, organizing their own percussion setups, keeping more detailed personal financial records, and more. In essence, each pay-per-service percussionist would be taking on the role of operating his/her own small business just as freelance musicians already do. Except for this new relationship with its musicians, under a pay-per-service model, the “orchestra” as an institution could continue to operate in virtually the same way as in the traditional model with a professional administrative staff to raise funds, schedule events, enter into contracts with guest artists, and so on. In an extreme scenario, the musicians themselves might have to take on the responsibility for these operations, too.

Another alternative model, a “music central” model, would be one in which an orchestra might simply exist as an association of independent musicians in all musical genres, serving as a central organization to provide the entire spectrum of live music services to a community from classical and pops concerts to chamber music, school and community programs, music education services, Broadway shows, jazz, world music, and possibly even community social events. In some small communities, forms of this model already exist, mainly in university music departments, which provide virtually all of their community’s live music services. Such orchestras may be semi-professional or even amateur/volunteer. Here again the orchestra percussionist may also have to occasionally take on the role of impresario, manager, educator, publicist, accountant, or more. To the extent that percussionists have the ability to perform in a wide range of styles (symphonic, chamber, solo, jazz, world) and to share their knowledge (music classes, lessons, lectures, workshops, public occasions), they will be better equipped to sustain their careers in music while also remaining financially viable.

Various forms of part-time community orchestras, comprised of amateur, volunteer, or semi-professional musicians, can provide satisfying opportunities for those who want to perform in an orchestra, but who also have found employment elsewhere in jobs that produce a higher level of financial security, for example, as doctors, lawyers, technical engineers,

or administrators. In this scenario, it may not be as crucial for these musicians to have achieved the highest level of performance skills, though having such skills could certainly increase the satisfaction derived from performing.

### **Generating supplemental income**

Except for percussionists who are fortunate enough to have positions in full-time symphony orchestras that can provide the income and benefits necessary to sustain a family of four in a middle-class lifestyle, most percussionists elsewhere will find it desirable to have supplemental sources of income. Some of the same skills that freelance musicians routinely have to use – maintaining business relationships (networking), having basic business skills (described above), being reliable in fulfilling obligations, showing up on time, treating associates and clients with respect, and of course, doing the job well – are crucial.

Orchestra musicians have traditionally generated supplemental income by teaching their instruments either in conjunction with music schools or in their own private studios. There are a variety of teaching styles in the twenty-first century, but many teachers in their private studios have embraced a soft style in which each student is treated individually, rather than having every student conform to a strict pedagogy. This style of teaching requires the teacher to observe thoughtfully each student's performance and then to respond in a positive manner to address specific problems while providing some degree of inspiration in order to motivate the student to continue to make progress. To some degree, this skill is acquired through a process of trial and error, and experience is usually the primary means by which a teacher continually improves effectiveness with this teaching style.

Presenting workshops, seminars, and guest residencies can also be a professionally satisfying way to generate supplemental income. To be most effective, these kinds of services can require a significant amount of advance planning to develop a database of potential presenters, to make individualized contacts, and to target the program content toward specific age groups or areas of interest. Preparing and maintaining repertoire for solo recital/performance opportunities, possibly in conjunction with the workshop and seminar presentations, would certainly be an added option, though it could also require an additional investment of preparation time. Another related source of supplemental income could be preparing and performing chamber music repertoire, or even forming and managing an ad hoc chamber ensemble with colleagues.

## **Acquiring the performance skills necessary to become an orchestral percussionist**

Having considered some of the issues faced by percussionists when they are already in a symphony orchestra, attention will now turn to general steps that can be taken to help an aspiring orchestral percussionist win a position in an orchestra's percussion section. The most important decision for anyone who wants to pursue a career as an orchestra musician is selecting, as soon as possible, the right teacher, the teacher who provides the necessary support and inspiration through the lengthy process of acquiring technical skills while remaining healthy emotionally. It will obviously be most helpful if the teacher has a strong background in orchestral music, primarily as a performer, but also as an educator and advocate. A useful rule of thumb is to find a teacher who is doing exactly what it is that the student ultimately wants to do. In other words, the person who decides to be an orchestra musician will be best served by finding a teacher who is already performing in an orchestra, and preferably in as high-ranking an orchestra as possible. However, it is important to bear in mind that a great performer is not necessarily a great teacher, so if a supportive and inspiring atmosphere is missing, the student should consider looking elsewhere for a teacher.

The second important decision is to determine which specific environment – conservatory, music school, university, or alternative – would be the best one in which to assimilate and nurture the skills necessary for success in a career as an orchestra musician. A conservatory that has faculty members who are closely connected with a professional orchestra would generally be the best choice. Other factors such as the city in which the institution is located and the availability of access to regular performances by high-level orchestras should be considered. The leading conservatories will also generally have very gifted students on all instruments who can provide “lateral learning” – the additional support and inspiration that students provide for each other.

For anyone really serious about playing professionally in an orchestra, attending graduate school may merely postpone the process of preparing for auditions and proactively spending the time necessary to seek an orchestra position. By the time one graduates from a music school or conservatory, the technical skills needed to win an audition for a full-time professional orchestra position should already be in place. If a deep familiarity with the standard orchestra repertoire is also in place, so much the better. A more proactive alternative for the person who is disciplined enough to do so would be to use the resources of time and money that would otherwise have been spent on graduate school to instead prepare

audition materials and to listen to the repertoire in order to learn the music as a whole and not just the specific parts. Time could also be devoted to arranging periodic personal coaching sessions with one or more actively performing orchestra musicians, preferably with ones in major orchestras. This could be an effective way to insert one's self into the network of professional orchestra musicians. Additionally, it would be wise to attend as many concerts by orchestras as possible to observe the percussion performance practices and to deepen an understanding of the repertoire through active listening. Follow up by making every attempt to meet with the orchestra's percussionists after each concert to solicit their perspectives on the performance.

## **Networking**

The late Charles Owen, who was the principal percussionist in the Philadelphia Orchestra from 1954 to 1972, regularly offered the following observation: "It's not who you know that counts, it's who knows you." Networking – building a web of relationships with others who have the potential to be helpful in achieving desired outcomes – has always been important, and it will certainly continue to be so. For anyone who is serious about becoming a percussionist in a professional orchestra, a useful strategy is to be proactive in networking; make contact with current orchestra percussionists and arrange to meet with them for a lesson, lunch, or coffee. Ask if they know of any openings or opportunities, not just for full-time positions, but also for extra players, and be sure to leave a calling card. If travel costs are a concern, start close to home and gradually expand further.

## **Planning for percussion auditions**

Auditions for symphony orchestras are highly competitive with ever-increasing numbers of exceptionally fine players seeking available positions. In this environment, it has become extremely challenging to stand out in an audition. At the most basic level, auditions are simply about the notes – playing what's on the page. Mistakes and missed notes, especially on the keyboard percussion instruments, and incorrect rhythms must be fully addressed early in the process of preparing for an audition. But beyond these basics, in order to stand out in an audition, the preparation needs to be very deep. Cramming usually won't work, so it is best to have a detailed plan for preparation over a minimum of two months prior to an

audition. Having mini-goals for each day of preparation and having mile-markers to assess progress should be part of the plan. Ideally, having a long-term plan will build confidence, which can also be enhanced by regularly playing the audition repertoire for others who are following along with a score or by recording one's self and listening to the playback with a score. The primary goal in preparing for an orchestra audition is to know the required repertoire in depth. Possessing a deep knowledge of the music, including all of the parts, not just the percussion parts, will provide a significant advantage over other auditionees who have not gone to the trouble to do so. Really liking the music is even better. Fully knowing the music, having a big-picture sense not only of the music's details but also of its structure and emotional force, will also be helpful in dealing with ancillary issues in an audition: reading alternate print versions of the parts, playing along with a conductor, being asked to count out loud, making variations in tempi, and so on.

The plan of preparation can also include efforts to become familiar with as many versions/editions of the parts as possible, including all of the percussion parts in the audition repertoire, even the parts on instruments other than the ones specified on the audition list. Excerpt books can be very helpful, but it is best to become familiar with the regular published editions that are actually used by orchestras.

As technical performance standards on all instruments continue to increase, orchestra auditions require that solo repertoire be performed, even by non-principal players. On keyboard percussion instruments, a secure technique in performing four-mallet solo marimba and vibraphone repertoire has become an expectation in orchestra auditions.

An important detail for timpanists is to know in advance of an audition which specific instruments will be available, and then to find ways to practice on similar, if not identical, timpani in order to be familiar with the operation of the pedals and the overall sound quality. It would be ideal if an auditionee could provide his/her own timpani, but the added commitment of time and expense would have to be considered in each situation.

There are upfront costs in any business enterprise, and seeking a new position as a professional orchestra musician is no exception. It is critical for success to have a plan that takes into account the costs of traveling to and from auditions, researching potential openings, and communicating with orchestra administrations, not to mention the regular day-to-day living expenses while in the process of preparation for the next audition. It is wise to plan for it to take from five to ten years of auditioning to finally win an audition, though with a bit of luck it could happen sooner. It is also wise to plan to take as many auditions as possible, including openings for

part-time positions. A part-time position, along with some private teaching, can provide enough income to cover living expenses and also to bolster a résumé. But regardless of what kind of employment may be needed, care will have to be taken to find the daily preparation time necessary for future auditions with higher levels of orchestras.

### **Percussion auditions**

To the extent possible, it is helpful for percussionists to bring their own instruments to an audition, simply because auditionees will then be that much more familiar with obtaining desired sound qualities. Small instruments such as tambourines, triangles, cymbals, and even snare drums are relatively easy to bring along. Any of these instruments that would be provided by the orchestra are likely to be unfamiliar, which will just add another layer of potential problems in a situation that is already stressful. Larger instruments such as bass drums and keyboard instruments are usually provided by the orchestra, and auditionees should be prepared with appropriate sticks and mallets, especially for bass drums of differing sizes.

It is wise to have thought about ways to ensure that there will be rapid accessibility to any personal instruments and sticks during an audition. The object is to avoid wasting precious time trying to find mallets or to set up instruments during the audition. One solution is to view the audition space in advance in order to determine where personal instruments and sticks can be placed in that area, taking into account ease of access as well as minimal disruption to other auditionees. Two stick bags can be preset specifically for the audition repertoire. One stick bag that can easily be carried along by the player from instrument to instrument would contain only mallets used for the specific instruments to be played, for example, one pair each of xylophone, glockenspiel, vibraphone, snare drum, bass drum, and suspended cymbal mallets. The second stick bag would be placed in the preselected spot within the audition area, and it would include one set each of harder and softer mallets for each instrument in the event that the audition committee or conductor requests a change of mallets or sound.

### **Maintaining a healthy (positive) attitude**

Above all, it will continue to be enormously useful to constantly remind one's self of whatever it was about making music that provided the

inspiration and motivation in the first place to pursue a career as a symphony orchestra musician.

### **General concerns regarding economic and social pressures affecting symphony orchestras**

It will be generally helpful to foster some sense of the current economic and social conditions in which symphony orchestras find themselves. Symphony orchestras in Europe that were entirely supported by aristocratic patrons through the eighteenth and nineteenth centuries have more recently been financed by national and local governments in keeping with long-standing values associated with national identity. However, the steady influence of globalized economics and communications has placed new financial pressures on governments in Europe, causing them to gradually pull back on their support for orchestras. To a lesser extent, governments and symphony orchestras in Canada, Latin America, and Australia are also feeling the same global financial pressures, while orchestras throughout Asia are experiencing exactly the opposite – a rapidly growing interest in orchestral music associated with newly gained wealth coupled with a strong sense of national identity and a desire for international prestige. As Asian economies continue to grow, symphony orchestras and Western classical music should fare very well there, with steadily increasing support not only from their national and local governments, but also from newly wealthy individuals and businesses.

The same global financial pressures on governments and arts organizations have been present for years in North America, though a few orchestras in a handful of major cities have been able to accumulate endowments that are large enough to provide some insulation from these pressures and to enable them to sustain themselves, at least in the short term. But in the early years of the twenty-first century, many symphony orchestras in communities outside of the major metropolitan areas find themselves under severe financial stress, resulting from steady decreases in attendance and reductions in government and corporate arts funding.

One significant factor in North America affecting both attendance and giving by individual donors and businesses is that there has been a long-term decline in the study of classical music, not only in grade school music education classes, but also in teacher training, in favor of an increasing focus on more popular musical forms (Broadway show music, popular “Idol” television shows, etc.). The effect on the general public has been a diminishing appreciation for orchestral music and a decrease of interest in

public support for symphony orchestras. This shift has occurred in an environment of increased competition for the available leisure time by a growing number of performing arts and fine arts institutions, as well as from mass-market media – live and digital – and from the increasing influence of digital devices.

Music has become ubiquitous in the environment. It can be heard electronically virtually everywhere throughout the day – waking up to an alarm clock/radio, viewing morning television programs, riding in an automobile, in elevators, in offices and retail settings, while walking on city sidewalks, while exercising, when sitting in a movie theater, when connected to the Internet, when cell phones ring, and so on. The net effect of this constant barrage of environmental music on the ears is to diminish the sense of music's preciousness. The challenge for orchestras and their musicians is to preserve and share the sense of preciousness in their music, not only through their performances, but also through education and advocacy.

Yet another major factor affecting symphony orchestras is the flooding of the world's orchestral marketplace with ever-larger numbers of instrumentalists who have achieved very high performance levels. Not only has the pressure of greater competition for available positions in professional orchestras been raised, but even after winning a position, the value of that position, in terms of the winner's income, is ultimately going to be affected by the laws of supply and demand – the greater the supply of highly qualified applicants, the lower the income potential for winning applicants. These trends will likely continue to have an effect on symphony orchestras in varying degrees for some time to come, regardless of where any particular orchestra exists on the spectrum of government support – from little or none to total – and there is no turnaround in sight. In fact, these trends are accelerating, and they will have to be taken into account by anyone considering a career as an orchestral musician, even for musicians in those orchestras fortunate enough to have some measure of insulation from global market forces.

### **Valuing school and community educational programs**

In many places, especially in North America, it cannot be assumed that public education, and even the formal education of music teachers, will provide an in-depth appreciation of Western classical music or of orchestral music in particular. It will become increasingly important for symphony orchestra musicians to recognize that virtually every time they perform, they are educators as well as performers. Musicians who are

comfortable with public speaking and writing will be better equipped to help audiences, especially new audiences, to better appreciate the music that is being performed. It would also be useful for performers to be able to assess their audiences in order to tailor the specific information and delivery style to each particular audience. The goal is not to “dumb down” the experience, but rather to help inexperienced listeners to better appreciate the music they hear.

However, there is some encouraging news. The music presented to audiences by symphony orchestras has long been ranked among the most inspirational in the world with much of it being the product of some of the greatest minds of Western civilization, past and present. It is likely that this genre of music will continue to be valued by a significant segment of the world’s population, albeit with an intrinsic bias toward older, more educated, and more affluent demographics. Additionally and out of necessity, although with some push-back from traditionalists, orchestras everywhere are broadening the scope of their offerings in order to attract and engage wider audiences through thematic programming, pops concerts, educational concerts, collaborations with dance and theatrical companies, and experimentation with video and digital media in live performances.

One thing is certain – as satisfying as it can be to hear a performance of any of the great music from the orchestral repertoire, there can scarcely be an experience anywhere to compare with the satisfaction to be had in performing the snare drum part to Rimsky-Korsakov’s *Scheherazade* or the bass drum part to Stravinsky’s *Le Sacre du Printemps* with a professional symphony orchestra.



PART TWO

## **The development of percussion instruments**



### 3 Marimba revolution

#### Mallet instruments, repertoire, and technique in the twenty-first century

WILLIAM MOERSCH

The antecedents of modern mallet instruments may be the oldest known melodic instruments, with some artifacts believed to date as far back as the Neolithic Period, between 5,000 and 9,000 years ago.<sup>1</sup> Glockenspiels and xylophones eventually entered European orchestra usage in a variety of forms: individual bars, simply used as needed; keyboard activated, as in the celesta and keyboard glockenspiel; and the mallet-played configurations of the four-row xylophone and the chromatic keyboard. The marimba evolved from Africa, through Central America, and into North America, introduced in modern form by early twentieth-century manufacturers in the United States, primarily J. C. Deagan and the Leedy Drum Company. Various instruments offered by Deagan in 1910 included Roundtop and Parsifal glockenspiels, and hybrid marimba-xylophones in ranges of up to six octaves (E2-E8).<sup>2</sup> The vibraphone developed in the late 1920s through the innovations of Leedy and Deagan in the United States and the Premier Drum Company in England.

The history and application of the various mallet percussion instruments also influenced their development. Glockenspiels were primarily used in orchestral music and changed little over the years. Xylophone, although part of the orchestral tradition, became the first solo mallet instrument in the low-fidelity days of acoustic recording and later radio, reaching a high standard in the Deagan “Artist Special” and Leedy “Solo-Tone Green Bros. Special” instruments of the 1920s and 1930s. The marimba was primarily an ensemble instrument, whether in the marimba bands of Guatemala, with one or two instruments shared by several players, or in the marimba orchestras of Clair Omar Musser of the 1930s, with many instruments in a variety of ranges, each played by a single player. Thus, the famous Deagan World’s Fair marimbas of three-and-a-half or four-and-a-half octaves (C3-F7) and King George marimbas of four octaves were accompanied by separate bass marimbas of one-and-a-half or two octaves. When the marimba finally began to develop as a solo instrument in the 1940s and 1950s, the state-of-the-art instrument was the four-and-a-third-octave (A2-C7) Musser Canterbury.

By the 1960s, instruments manufactured by Deagan and Musser in the United States, Premier in England, and Bergerault in France dominated the market, with standardized ranges of two-and-a-half-octave glockenspiels, three-and-a-half-octave xylophones, three-octave vibraphones, and four- or four-and-a-third-octave marimbas. However, in the 1970s, ranges began increasing. In Japan, Keiko Abe worked with Yamaha to extend the bass of their then current four-octave marimba, first to four-and-a-half octaves (F2–C7) in 1973 and later to five octaves (C2–C7) during 1981–1984.<sup>3</sup> Michiko Takahashi requested a custom marimba from Saburo Mizuno that resulted, in 1979, in an instrument of seven octaves (C1–C8): a five-and-a-half-octave Korogi marimba (C2–G7), with a half-octave extension on the top and an octave bass extension on the bottom.<sup>4</sup> In Europe, five-octave marimbas were introduced by Studio 49 in Germany and Bergerault in France during the late 1970s. In the 1980s, Japanese Korogi marimbas were marketed in the Netherlands as “Concorde” and in the United States as “Kori,” including a four-and-a-half-octave instrument (F2–C7). American-made marimbas also gradually increased in range during the 1980s and 1990s until the five-octave marimba became the worldwide standard, available now from an assortment of manufacturers, including Adams, Bergerault/Dynasty, Coe Percussion, DeMorrow, Korogi, Majestic, Malletech, Marimba One, Ludwig Musser, and Yamaha. Recent developments include continued refinements in intonation, production models of five-and-a-half octaves (C2–G7), and prototype pedal damper systems for marimbas.

Vibraphones followed a similar path in development: Deagan introduced a four-octave instrument in 1976, followed by Bergerault and, more recently, by Yamaha, three-and-a-half and four-octave models. Ludwig Musser added new frame designs by Gary Burton and John Mark Piper. Various forms of amplification pickups and MIDI capability have been introduced, and radically new instrument designs from Malletech and VanderPlas are now entering the market. Xylophones, glockenspiels, and chimes have all seen similar development in recent years in both range and quality, and the Aluphone, a keyboard composed of spun aluminum bowls, is the latest member of the mallet percussion family.

The mallets themselves have undergone as many changes. By the 1960s, mallets were commonly unwound brass, plastic, wood or rubber, and yarn- or cord-wound rubber, in two to four gradations of hardness and with rattan handles. Among the few “signature” mallet lines were Terry Gibbs and Lionel Hampton cord-wound vibraphone mallets, Red Norvo “slap” mallets, and Jose Bethancourt raw-rubber-wound, Guatemalan-style marimba mallets. In 1968, Keiko Abe needed a new type of mallet for some of her repertoire: a single mallet that could be both soft and hard. In response,

Hidehiko Sato developed the “two-tone” mallet and the first of several editions of an Abe signature line from Yamaha soon followed in the 1970s.<sup>5</sup> In the United States, Bill Dreiman (aka “Bill Marimba”) founded the short-lived Good Vibes Malletworks and produced exceptionally fine mallets, primarily signature mallets for prominent vibraphonists including Gary Burton, David Friedman, Bobby Hutcherson, Mike Mainieri, Dave Pike, and David Samuels. Good Vibes Malletworks was quickly acquired by Ludwig Musser. Influenced by the stiff hardwood handles of Guatemalan-style marimba mallets, Leigh Howard Stevens (LHS) began experimenting with birch handles and softer yarn; his signature mallet line was first offered by Vic Firth. Additional mallet-specialty companies soon followed, including Balter, Deschler, Hyer, Encore, Mallettech, and Innovative, and each year now brings new signature mallet lines. The latest, Innovative’s Pedro Carneiro series, changes the concept from the now-standard “two-tone” into “multi-zone,” heightening the contrast of different faces of the mallet head to produce varied timbres as the players raise their wrists.

The trajectory, if you will, of the solo repertoire for the mallet percussion instruments began as a small light in the darkness, slowly gaining momentum and altitude, cresting and then bursting forth in a chrysanthemum display of fireworks. A sequence common to the introduction of any new instrument transpired: first featured primarily as a novelty, then seeking legitimacy through the performance of transcriptions of accepted music originally written for other instruments, and finally developing a unique and original repertoire. Also particular to the keyboard percussion instruments has been the transition from producing purely percussive effects, to emulating the sound and phrasing of single-line instruments, that is, strings, brass, winds, or voice, to modeling on polyphonic instruments, primarily piano. Each instrument has followed this path through a series of advocates and innovators, including, for the xylophone: George Hamilton Green, Red Norvo, Eiichi Asabuki, and Yoichi Hiraoka; the vibraphone: Lionel Hampton, Norvo, Milt Jackson, and Burton; and the marimba: Musser, Vida Chenoweth, Abe, and Stevens. A closer examination of the evolution of concert repertoire for mallet percussion will help to illustrate this point.

## **1940–1960**

The first pieces of concert repertoire for solo marimba were written in the 1940s and 1950s: the concertos of Paul Creston, Darius Milhaud, James Basta, Robert Kurka, Benigno Cruz, Jorge Sarmientos, and Ernst Mahle;

and the solo works of Musser, Eloise Matthies Niwa, Alfred Fissinger, Emma Lou Diemer, Harald Mommsen, Eugene Ulrich, Bernard Rogers, and Lorraine Goodrich Irvin, most of them championed by Chenoweth. Many of these pieces feature single-line melodies or block chord chorales, although a few, for example, those of Milhaud, Kurka, Sarmientos, and Fissinger, include more contrapuntal writing. The vibraphone, although known primarily as a jazz instrument during the same period, gained some notice in Milhaud's *Concerto for Marimba and Vibraphone* (1947) mentioned above and through its increasing use in chamber music, including Pierre Boulez's *Le marteau sans maître* (1955) and Karlheinz Stockhausen's *Refrain Nr. 11* (1959). The xylophone, after its heyday in the era of acoustic recording, ragtime, vaudeville, and radio, was in decline, having been replaced in popular favor by the mellower vibraphone and marimba and was largely still limited to playing transcriptions.

### 1960–1980

In 1962, Vida Chenoweth performed her second and final Town Hall recital in New York and released a recording, *Vida Chenoweth: Classic Marimbist*, each featuring a combination of original repertoire and transcriptions. The xylophone gained two major concertos, *Fantasy on Japanese Woodprints* (1965), by Armenian-American Alan Hovhaness, and *Concertino for Xylophone* (1965), by Toshiro Mayuzumi of Japan, both written for Yoichi Hiraoka. George Crumb's *Madrigals, Book I* (1965), for soprano, vibraphone, and contrabass, cataloged a growing number of "extended" vibraphone techniques, including dead strokes, harmonics, damper bar clusters, finger dampening, and "pitch-bending," which was first popularized by Gary Burton, but credited by him to Emil Richards.<sup>6</sup> Burton's own *Solo* (1966) and *Four Mallet Studies* (1968) were the first publications to document his more pianistic, four-mallet approach to vibraphone. Equally significant for the marimba were Keiko Abe's Tokyo recitals of 1968, 1969, and 1971, which introduced a large body of new Japanese solo, chamber, and concerto repertoire, including *Conversation Suite* (1962), *Torse III* (1965), and *Concerto for Marimba and String Ensemble* (1969) by Akira Miyoshi, *Two Movements for Marimba* (1968) by Toshimitsu Tanaka, *Time for Marimba* (1968) and *Concerto for Marimba and Orchestra* (1969) by Minoru Miki, *Divertimento for Marimba and Alto Saxophone* (1968) by Akira Yuyama, *Quintet for Marimba, 3 Flutes, and Contrabass, "Mattinata"* (1968) by Teruyuki Noda, and *Mirage for Marimba* (1971) by Yasuo Sueyoshi.<sup>7</sup> Many of the Japanese pieces utilized the marimba in a more demanding role in terms of

technique, dynamic contrast, and musical context, than previously existing repertoire. Yuyama's *Divertimento* was one of the first pieces calling for six mallets.

The 1970s brought more international recognition to marimba. Paul Sifler's *Marimba Suite* (1971) was written for Karen Ervin Pershing, who placed second in the *Concours Internationale d'Execution Musicale* in Geneva. Abe, who began teaching marimba at Tokyo's Toho Gakuen School of Music in 1970, was featured on an international recording, *Contemporary Music from Japan: Vol. I: Music for Marimba*, containing some of the music from her recitals. When the record came out in the United States, it had an immediate impact on many developing American marimbists.<sup>8</sup> Japanese marimbist Michiko Takahashi commissioned Dutch composer Ton de Leeuw's *Midare* (1972) and won first prize in the Gaudeamus Foundation Interpreters of Contemporary Music Competition in 1973. Toru Takemitsu's *Gitimalya* (1974), for marimba and orchestra, and Hans Werner Henze's *Five Scenes from the Snow Country* (1978) were also written for Takahashi.

The Percussive Arts Society (PAS), founded in 1961, held its first Percussive Arts Society International Convention (PASIC) in 1976, which introduced marimbists Leigh Howard Stevens (LHS) and Gordon Stout. Stevens, a student of Chenoweth, had developed a new marimba technique and was commissioning pieces to utilize it, including Raymond Helble's *Preludes for Marimba* (1971–1973, 1974) and *Toccata Fantasy* (1979), David Maslanka's *Variations on Lost Love* (1977), and John Serry's *Rhapsody for Marimba*, "Night Rhapsody" (1979). Stout, who has become one of the most significant of marimbist/composers, made an immediate impact with his *Two Mexican Dances* (1974) and *Etudes for Marimba* (1973–1976). The following year, Abe (see Figure 3.1) made her PASIC and New York debuts, allowing North American audiences to experience her and the Yamaha YM-5000 marimba live for the first time. The repertoire on this tour included several of the solo pieces mentioned above, plus Katsuhiko Tsubonoh's *Meniscus for Marimba* (1971) and Tokohide Niimi's *For Marimba I* (1975). As a result of Abe's recitals in North America, many marimbists began traveling to Japan to study with her at Toho Gakuen. Abe also began her long and fruitful contribution as a composer with *Michi* (1978).

The xylophone enjoyed considerable benefit in the 1970s from the efforts of Bob Becker, William Cahn, and the other members of Nexus in reviving the music of xylophonist George Hamilton Green through both their concerts and a direct-to-disc recording, *Nexus Ragtime Concert* (1976).

Other significant composers writing for mallet percussion were Steve Reich, in *Drumming* (1971), and much of his other music to date; Luciano



Figure 3.1 Keiko Abe.

Berio, with *Linea* (1973) for two pianos, marimba, and vibraphone; Peter Maxwell Davies, with *Ave Maris Stella* (1975), written for his chamber sextet, *The Fires of London*, and featuring a prominent solo cadenza for marimba; and Charles Wuorinen, in *Percussion Duo* (1979), for marimba, vibraphone, and piano, written for Steven Schick and James Avery. Two pieces by German composer Tilo Medek, *Konzert für Marimbaphon und Orchester* (1976) and *Zur Unzeit Erblühtes* (1977), may well be the first published for five-octave marimba. Other marimba concertos by Werner Thärichen, Akira Ifukube, Jiri Valek, Raymond Helble, and Rand Steiger were among the more than thirty written during this period in Europe, Japan, and the Americas.

### 1980–2000

If an explosion was yet to come, the fuse was lit in the 1980s, as Stevens followed the publication of his *Method of Movement for Marimba* (1979) by founding the annual LHS Summer Marimba Seminar, Stout accepted a position at Ithaca College, and many prominent composers were enticed to write for the marimba. William Moersch, after commissioning Irwin Bazelon's *Suite for Marimba* (1980), Richard Rodney Bennett's *After Syrinx II* (1984), and Andrew Thomas' *Merlin* (1985), partnered with Stevens, Stout, and PAS to commission Jacob Druckman's *Reflections on*

*the Nature of Water* (1986), Roger Reynolds' *Islands from Archipelago II: Autumn Island* (1986), and Joseph Schwantner's *Velocities* (1990), with funding from the National Endowment for the Arts. Moersch founded New Music Marimba (NMM) in 1986, and their subsequent commissions include Bennett's *Concerto for Marimba* (1988), Thomas' *Loving Mad Tom*, for marimba and orchestra (1990), and Libby Larsen's *After Hampton: Concerto for Marimba* (1992). Eric Ewazen's *Northern Lights* (1989) was also commissioned by Moersch, but ultimately premiered by and dedicated to Stout.<sup>9</sup> The 1990s saw the introduction of marimba degree programs at institutions in the United States; Moersch created graduate marimba degree programs at Rutgers University and Peabody Conservatory, and later moved to the University of Illinois.

Abe returned to the United States in 1981, as soloist in Ifukube's *Lauda Concertata for Orchestra and Marimba* (1976) in her Carnegie Hall debut and also to perform at PASIC. She brought with her a prototype Yamaha five-octave marimba. For her next PASIC appearance in 1984, Abe introduced the Yamaha YM-6000 marimba and Miki's *Marimba Spiritual* (1984).

South African composer Peter Klatzow's *Figures in a Landscape* (1984), *Concerto for Marimba and String Orchestra* (1985), *Dances of Earth and Fire* (1988), and *Concerto for Flute, Marimba, and Strings* (1993) were all written for American Robert van Sice, one of many who traveled to Japan to study with Abe. Stout's *Sedimental Structures* (1998) was also written for van Sice, who taught at the Rotterdams Conservatorium in the Netherlands from 1988 to 1997, and then returned to the United States, teaching at Yale and Peabody Conservatory.

Robert Aldridge's *Combo Platter* (1983), written for Nancy Zeltsman, inspired the founding of her marimba and violin duo, Marimolin (1985–1996). Marimolin, in turn, inspired the creation of many new pieces, including Thomas Oboe Lee's *Marimolin* (1986), Robert Aldridge's *three-dance* [sic] (1987), Lyle Mays' *Somewhere in Maine* (1988), Gunther Schuller's *Phantasmata* (1989), and Paul Lansky's *Hop* (1993). Zeltsman also partnered with Moersch, van Sice, NMM, and PAS to commission Steven Mackey's *See ya Thursday* (1993), Eugene O'Brien's *Rhyme and Reason* (1993), and Schuller's *Marimbology* (1993), with funding from Meet the Composer/Reader's Digest. In 1993, Zeltsman began teaching at both the Boston Conservatory and Berklee College of Music.

Dame Evelyn Glennie, in the United Kingdom, was another visiting student of Abe's. Kenneth Dempster's *Concerto Palindromos* for marimba, vibraphone, and orchestra (1985) was the first of her many commissions. Others for mallet percussion include David Gow's *Marimba Concerto* (1992), Rory Boyle's *Marimba Concerto* (1993), Thea Musgrave's *Journey*

through a Japanese Landscape (1994), and Ney Rosauro's *Concerto for Vibraphone* (1996).

The marimba gradually began to gain recognition in the classical music world. The New York-based recital competitions Concert Artists Guild, Young Concert Artists, Affiliate Artists, and East West Artists, each previously largely uninterested in either percussion or contemporary music, began recognizing rising marimba talent: Douglas Walter (1984), William Moersch (1988), Joseph Gramley (1993), Makoto Nakura (1994), and Nanae Mimura (1998) were all winners of prizes. Then, in 1995, both the LHS International Marimba Competition (Eric Sammut, first prize) and the International Percussion (Marimba) Competition Luxembourg (Momoko Kamiya and Katarzyna Mycka, first prizes) were held, beginning an ever-growing roster of marimba-specific international competitions. Subsequent incarnations included the World Marimba Competition Stuttgart (1996 and 1999), a second LHS International Marimba Competition (1998), and the World Marimba Competition Okaya (1999).

Prominent orchestras also began to recognize the marimba through commissions. The Boston Symphony Orchestra commissioned a concerto for marimba and orchestra, Maurice Wright's *Concertpiece* (1993), to feature orchestra member Will Hudgins, and the Oregon Symphony commissioned Tomas Svoboda's *Concerto for Marimba and Orchestra* (1995), for Niel DePonte. Other prominent marimba concertos of the more than 113 written during these two decades include those of Marta Ptaszynska (1985), Rosauro (1986), Frank Nuyts (1987), Serry (1987), Maslanka (1989), Miguel Franco (1991), Klatzow (1993), Alejandro Viñao (1993), Abe (1995), Anders Koppel (1995), Kevin Puts (1997), and Ewazen (1999).<sup>10</sup> Of particular note for marimba in chamber music are Elliott Carter's *Esprit rude/esprit doux II* (1994), for marimba, flute, and clarinet, written in honor of Pierre Boulez's seventieth birthday, David Kechley's *Valencia* (1998) for marimba and saxophone quartet, and Kenji Bunch's *Paraphraseology* (1999) for marimba and violin.

Composers also began featuring the marimba in combination with electronic sounds, at first prerecorded and then progressively interactive. Some of the more notable examples of this period are Gary Kulesha's *Angels* (1983), Martin Wesley-Smith's *For Marimba and Tape* (1983), Nigel Westlake's *Fabian Theory* (1987), Daniel McCarthy's *Rimbasly* (1989), and Christos Hatzis' *Fertility Rites* (1997).<sup>11</sup>

As the North American version of the marimba gained in international recognition, so did greater awareness of its Central American predecessor, largely through the efforts of Chenoweth and Laurence Kaptain. Special mention should be made of Maestro Zeferino Nandayapa, the patriarch of

Marimba Nandayapa. Federico Alvarez del Toro's *Sinfonia "El Espiritu de la Tierra"* (1984) was written for Nandayapa and the First International Festival of the Marimba, for the African and Central American versions only, was held in Mexico City in 1991.

Concert repertoire for vibraphone also expanded significantly during these two decades, evidenced by Takemitsu's *Rain Tree* (1981), François-Bernard Mâche's *Phénix* (1981), Christopher Deane's *Mourning Dove Sonnet* (1983), expanding on "extended techniques," Rodney Sharman's *Apollo's Touch* (1992), and Emmanuel Séjourné's *Concerto for Vibraphone* (1999).

## 2000–present

Advances in communication technology have long spurred both the dissemination of information and collaboration in creative activity. Mallet percussion has been a beneficiary of these developments, from the xylophone's advantage in acoustic recording, to the debut of the vibraphone in electric recording. The advent of the digital age has profoundly affected both society and music. The development of desktop publishing allowed for exponential growth in composition, with Stout, Zivkovic, Rosauero, and Pius Cheung, among the more notable of a torrent of marimbist/composers.

While the 1980s and 1990s were marked by the commissioning of major composers, funded by grants and consortia of arts organizations, the twenty-first century has seen the advent of private consortia on an international scale, funded by smaller, individual contributions and the growth of online "crowd funding" for a variety of projects. Commissioned marimba repertoire resulting from such new funding models includes Akemi Naito's *Memory of the Woods* (2000), Viñao's *Khan Variations* (2001), David Lang's *String of Pearls* (2006), Lansky's *Idle Fancies* (2008), Serry's *Groundlines* (2009), Wuorinen's *Marimba Variations* (2009), James Wood's *Secret Dialogues* (2014), and Lukas Ligeti's *Thinking Songs* (2015). In a similar manner, Zeltsman's ZMF New Music project produced the *Intermediate Masterworks for Marimba* (2009) by twenty-four composers including Louis Andriessen, Carla Bley, Chen Yi, Mackey, Mays, Paul Simon, Schuller, Steven Stucky, and Chinariy Ung. Zeltsman's efforts were echoed in turn by Samuel Solomon's compilation, *The MassChap 2010 Xylophone Collection*, featuring short works from fifty composers. Other compilations for mallet percussion include *Marimba Concert* (2000) and *Summit: Compositions for Unaccompanied Orchestra Bells* (2007), both edited by Sylvia Smith.

Several of the previous examples are also indicative of increasing attention being given to mallet percussion pedagogy. G. H. Green's mail-order

subscription *Instruction Course for the Xylophone* (1924–1926) and Morris Goldenberg’s *Modern School for Xylophone, Marimba, and Vibraphone* (1950), long standard teaching materials in the field, were supplemented by Stevens’ *Method of Movement for Marimba* (1979), Gary Cook’s *Teaching Percussion* (1988), and Stout’s *Ideo-Kinetics* (1993). Significant recent additions include Zeltsman’s *Four-Mallet Marimba Playing* (2003) and Cheung’s *Colors* (2011). College and university percussion positions, largely held in the previous generation by orchestral percussionists or music educators, are now filled by an ever-increasing number of mallet percussion artists. However, the heralded rise of mallet specialists in the 1980s and 1990s appears to have resulted in a subsequent generation of more broadly skilled generalists, as many percussion students absorb once-innovative techniques and repertoire as a matter of course.

The path of development from novelty to single-voiced melody to contrapuntal use is increasingly evidenced, perhaps none more so than by Cheung, from his performances and recording of the complete J. S. Bach: *Goldberg Variations*, to his own compositions, including *Symphonic Poem* (2007), *Poetic Fantasy* (2009), *Poem of Water* (2012), and *Princess Chang Ping: Concerto for Marimba* (2012). In turn, the last two pieces were written to feature the six-mallet abilities of Pei-Ching Wu. Six-mallet technique evolved through the efforts of several marimbists and vibraphonists including Abe, Chenoweth, and Nandayapa; Ludwig Albert, Séjourné, and Kai Stensgaard; and Dean Gronemeier, Robert Paterson, and Karol Szymanowski. Other marimba repertoire featuring six mallets includes Gronemeier’s *2HT2HDL* (1996), Andrew Thomas’ *Wind* (1999), Evan Hause’s *Circe* (2000), Paterson’s *Komodo* (2004), and Joe Porter’s *Concerto for Six-Mallet Marimba* (2012).<sup>12</sup> Albert has taken multiple-mallet technique a step (or two) further with his eight-mallet technique, as has Jane Boxall with her performances of “Marimba from Zero to Eight Mallets,” featuring compositions for each of the various increments.

Of note for vibraphone repertoire in recent years are Philippe Hurel’s *Loops II* (2002), Stockhausen’s *Vibra Elufa* (2003), Erik Lund’s *Blessed B* (2006), Halim El-Dabh’s *Sailing Wind* (2009), and Elliot Cole’s *Postludes* (2012), for one vibraphone and four players with two bows each. Technological advances have also led to increased opportunities in electronic music, particularly for vibraphone and interactive live electronics. Some representative examples include Karlheinz Essl’s *Sequitur XI* (2009), Baljinder Sekhon’s *Vibraphone+Electronics* (2013), and Steven Snowden’s *Long Distance* (2013).

The full flowering of the arcing trajectory has at last arrived: multiple international marimba festivals and competitions occur each year in North

and South America, Europe, Australia, China, and Japan. Slovenia hosted the “first ever” International Marimba Concerto Competition in 2005, chaired by Zivkovic.<sup>13</sup> Since 2000, over eighty marimba concertos have been introduced by composers including Frangis Ali-Sade (2001), Martin Blazeovich (2005, 2007), Anders Koppel (2001, 2002, 2004, 2006), Mackey (2005), Kurt Schwertsik (2008), Bright Sheng (2004), Christopher Theofanidis (2013), and Erki-Sven Tüür (2002).<sup>14</sup>

The PAS maintains the invaluable online bibliographic indexes, the *Siwe Guide to Solo and Ensemble Percussion Literature* and the *Fujii Database of Japanese Marimba Works*. As of this writing, the *Siwe Guide* lists 3,100 compositions for solo mallet instruments: 1,842 compositions for marimba, 741 for vibraphone, 248 for “mallets” (unspecified, or in any combination, for one player), 217 for xylophone, forty-four for glockenspiels or orchestra bells, and eight for chimes. These include concertos with band, orchestra, or chamber ensemble, sonatas for mallet percussion and piano, unaccompanied solos, and works for solo mallet percussion in combination with other instruments, voice, or electronics. The *Fujii Database* lists 724 compositions for marimba, whether solo, chamber ensemble, or concerto.<sup>15</sup> The author’s own *New Music Marimba Concerto List* now has entries for 250 concertos for marimba with orchestra or wind ensemble. While there is some unavoidable degree of duplication between these various references, these numbers signify truly exponential development.

Vida Chenoweth’s eloquent plea for the future of the marimba, “I would like to see the dedication of Stradivari on behalf of marimba construction. I would like to see the dedication of Beethoven on behalf of marimba composition. I would like to see the dedication of Wanda Landowska on behalf of marimba performance,”<sup>16</sup> has indeed been fulfilled.

## Notes

1. “Stone-Age ‘Marimba’ Is Discovered in Vietnam,” *New York Times* (March 18, 1954), p. 3.
2. M. Wheeler, “J.C. Deagan Percussion Instruments,” *Percussive Notes*, vol. 31, no. 2 (1992), 61–4.
3. R. Kite, *Keiko Abe: A Virtuoso Life* (Leesburg, VA: GP Percussion, 2007), pp. 208–9.
4. M. Takahashi, Interviewed by W. Moersch (New York, October 30, 1991).
5. Kite, *Keiko Abe*, p. 52.
6. G. Burton, *Learning to Listen: The Jazz Journey of Gary Burton* (Boston, MA: Berklee Press, 2013), p. 269.
7. Kite, *Keiko Abe*, pp. 57–60.
8. *Ibid.*, pp. 84–5.
9. In a similar fashion, M. Harris’ *Potpourri* (1996) and R. Aldridge’s *From My Little Island* (1988) were commissioned by S. Stevens (no relation), written for L. H. Stevens, and premiered by Moersch and Zeltzman, respectively.
10. W. Moersch, *New Music Marimba Concerto List* (Champaign, IL: New Music Marimba, 2015), pp. 3–11.
11. Y. Chen, “A Catalog of Solo Works for Marimba with Electronics and an Examination and Performance Guide of *Flux* for Marimba and Electronic Tape by Mei-Fang Lin,” unpublished DMA thesis, Arizona State University (2011).
12. P. Wu, “Extended Multiple Mallet Performance in Keyboard Percussion

through the Study of Performing Techniques of *Flame Dance* and *Water Fairies* by Wan-Jen-Huang,” unpublished DMA thesis, West Virginia University (2005), and J. Porter, “A New Six-Mallet Technique and its Pedagogical Approach,” unpublished MM thesis, University of Lethbridge (2011).

13. N. Sakimura, “International Marimba Concerto Competition 2005,” *Marimba.org*, February 12, 2005.
14. Moersch, *NMM Concerto List*, pp. 11–6.
15. [www.pas.org](http://www.pas.org).
16. L. H. Stevens, “An Interview with Vida Chenoweth,” *Percussive Notes*, vol. 15, no. 3 (1977), 22–4.

## 4 Instrumental ingredients

GARRY KVISTAD

Percussionists and designers of percussion instruments have traditionally looked for ways to improve the quality of their instruments and designs by making innovations to existing instruments or by developing entirely new ones. For these innovators, and for percussionists who want to improve the quality of sound they produce on their instruments, it is advantageous to study the science of sound, specifically the acoustics of percussion instruments.

My interest in percussion instrument design and acoustics began at Oberlin Conservatory in 1967 at one of my first timpani lessons with Cloyd Duff. He showed me the cartwheel-style timpani sticks he used in producing his mellifluous sound on timpani, and I wanted a pair. I couldn't afford to buy them, so I took a pair of Vic Firth wooden sticks with a round ball on the end that I already owned and went to Building and Grounds. I asked them to put the stick on a lathe and flatten the top and the underneath part of the ball, making it into a cartwheel shape. Duff had just showed me how to re-felt his cartwheel sticks, so I put the felt on these newly lathed sticks and brought them to my next lesson. Duff asked, "You made these from Vic Firth wooden sticks?" I said, "Yeah, I adapted them," and he responded, "You're getting an 'A' this semester!" With Duff's encouragement, I began to explore other ways to improve and adapt percussion instruments. In fact, as I began playing the music of John Cage and other composers that required the percussionist to find unusual instruments for the parts, I found that I was (almost) more interested in selecting the instruments than practicing the parts.

After graduating from Oberlin, I moved to Northern Illinois University in DeKalb, IL, where my newly formed percussion group, Blackearth, was appointed ensemble in residence. At Northern Illinois, I had more time to devote to making instruments and I decided I wanted to make a melodic percussion instrument. I had been reading Harry Partch's *Genesis of a Music*<sup>1</sup> for a couple of years trying to absorb it all. Partch made many melodic percussion instruments; however, his book was really obscure and pedantic, and I was just beginning to understand his theories.

Partch created a tuning system based on a scale of forty-three pitches to the octave, but he didn't use all forty-three pitches like Schoenberg would have done. Instead, he would select five or so pitches, but the right five

pitches to play specific scales. Partch discussed scales from ancient cultures in his book, including a five-tone Greek scale devised by Olympos, a Phrygian flutist and lyre player from the seventh century BCE. I was curious to hear this scale, but of course there is no extant music from that long ago. In order to hear the scale, I would have to build a melodic percussion instrument that could realize it.

My situation at Northern Illinois was a fortuitous one. Right next to the music department was the art department with a great wood shop and metal shop. Then I discovered that one of the professors in the physics department was acoustician Thomas Rossing, author of *Science of Percussion Instruments*.<sup>2</sup> As a faculty member, I was allowed to take a couple of courses a semester, so I enrolled in metalworking, woodworking, and physics classes. From Rossing, I learned how percussion instruments vibrate and how to affect their tuning. I also discovered that in order to hear the scale of Olympos, I would have to learn about the natural harmonic overtone series – the system on which this scale was constructed.

### **Natural harmonic overtone series**

The “just intonation” tuning system<sup>3</sup> used in Greek and other ancient cultures is based on the natural harmonic overtone series and is very different from the “equal temperament” tuning system that I had heard all my life on piano, marimba, or almost any other instrument used in Western music. To help me understand the terminology used in the natural harmonic overtone series, I wrote out the following definitions:

*Natural harmonic overtone series* – A series of frequencies that are related by whole real number integers.

*Equal temperament* – A method of tuning based on equal distances between each pitch of the scale.

*Just intonation* – A method of tuning based on the natural harmonic overtone series.

*Fundamental* – The first partial of a sound in the natural harmonic overtone series.

*Principle frequency* – The strongest vibrational mode of a sound (which is not always the fundamental tone) that determines the musical pitch.

*Overtone* – All the components of a given sound *except* the fundamental.

*Partials* – All the components of a given sound *including* the fundamental.

*Harmonics* – All the components of a given sound *including* the fundamental whose frequencies *are related* by whole real number integers.

*Harmonic overtones* – All the components of a given sound *except* the fundamental whose frequencies *are related* by whole real number integers.

*Nonharmonic overtones* – All the components of a given sound *except* the fundamental whose frequencies *are not related* by whole real number integers.

*Node* – Location on a vibrating body that has minimum vibration.

*Antinode* – Location on a vibrating body that has maximum vibration.

With an understanding of these basic terms, I was ready to tackle the acoustical world that was introduced to me by Rossing, including the natural harmonic overtone series and modes of vibrations.

## **Fundamental and overtones**

All sounds are the result of complex modes of vibration that include a fundamental tone and overtones. The relationship of the fundamental to its overtones determines the timbre of the sound. The purest sounds contain relationships that are related mathematically by low number integers (1, 2, 3, 4, etc.). This means that the fundamental tone ( $f_1$ ) vibrates at a given frequency while its overtones vibrate twice as fast, three times as fast, four times as fast, and so on ( $f_2$ ,  $f_3$ ,  $f_4$ , . . .). When these relationships exist, the overtones are considered to be harmonic and belong to the natural harmonic overtone series.

## **Modes of vibration**

Modes of vibration can be most easily understood by examining the vibration of a string. When a string is plucked, it vibrates in literally hundreds of different modes simultaneously; the whole string goes up and down, pivoting from both ends hundreds of times a second, creating the fundamental tone that we recognize as the pitch of the string. At the same time, the string is vibrating from various nodal points throughout the length of the string. These vibrations are in a mathematical relationship to each other as described above. The first overtone, an octave above the fundamental pitch, is vibrating twice as fast, and so it is in the relationship of 2:1. The second overtone, an octave and a fifth above the fundamental pitch, is vibrating three times as fast as the fundamental and is in the relationship of 3:1. This phenomenon continues infinitely with each new harmonic vibrating at an increasing ratio to the fundamental. A vibrating string creates all the harmonic overtones in the harmonic overtone series, thus giving string instruments a pure sound.

## Scale of Olympos

With this basic understanding of acoustics in relation to musical instruments, I embarked on my quest to hear the scale of Olympos. I am not a scientist, and I certainly am not a physicist. However, in my studies with Rossing, I was able to absorb the information I needed (and not much more) in order to create an instrument to replicate the ancient Greek scale of Olympos. I began my odyssey by cutting up aluminum tubes from old lawn chairs I found in the dump – they were a free source of material. I first tuned the tubes using an oscilloscope, then I discovered that Motorola made a tuner called a Scalatron that could produce 1,024 pitches to the octave. The Scalatron allowed me to tune the aluminum tubes precisely, and I created the scale of Olympos.

According to Partch, the ratios of the scale of Olympos were 1/1, 9/8, 6/5, 3/2, 8/5, and 2/1. These ratios form a pentatonic scale plus an octave, and since it has two minor seconds, it is called a minor pentatonic – a scale that is unusual in Western music. While we don't know the exact frequency of each pitch that Olympos used, we do know the relationship between each pitch. Partch had a tuning fork tuned to G 392.01 hertz (Hz), or number of cycles per second, and used this as the basis (1/1) of his 43 tone scale. If you multiply each of these ratios by 392.01, you obtain the frequencies of each pitch relative to the frequency of G.

Scale of Olympos in hertz based on just intonation relative to the frequency of G:

$$1/1 \times 392.01 = 392.01$$

$$9/8 \times 392.01 = 441.01$$

$$6/5 \times 392.01 = 470.41$$

$$3/2 \times 392.01 = 588.01$$

$$8/5 \times 392.01 = 627.22$$

When you compare the scale of Olympos expressed in just intonation with the same relative scale in equal temperament, you can get a sense of the difference in pitch relationships. In equal temperament, the distance of each of the twelve intervals in an octave is expressed by the twelfth root of two, an irrational number that equals approximately 1.0594630943592952645618252949219. If you multiply the frequency of any musical pitch by that (approximate) number, you get the frequency of the next higher pitch. While some of these frequencies are close to those tuned in the pure system of just intonation, the human ear is capable of hearing the deviation of even a fraction of a hertz and can detect this difference.

Scale of Olympos in hertz based on equal temperament relative to the frequency of G:

G = 392.01

A = 440

Bb = 466.16

D = 587.33

Eb = 622.25

I assembled the aluminum tubes, tuned to the scale of Olympos, in a row creating a metallophone, and I was finally able to hear how this ancient scale sounded. It was fantastic, and I knew other people would love to hear the sound. However, I realized that few people other than percussionists would play a metallophone, so I tried to think of a way the scale could be self-activated. I had used various kinds of wind chimes in percussion setups, but they were essentially noise-makers and didn't have specific tunings. It occurred to me that I could tune a wind chime to the scale of Olympos and anyone could hear the sound.

## **Wind chimes**

I constructed a wind chime just as basically as possible – a wooden top, a circle of tubes, a clapper, and a wind catcher. I knew that in order to get the best sound from the fundamental pitch, I had to suspend the tubes and drill holes at the nodal points where there is the minimum amount of vibration. I also knew that I had to have the clapper hit somewhere around the middle of each tube. Since the tubes were fastened at the top, there would be different nodal placements depending on how long the tube was. I determined that twenty-one inches of tubing (for tubes of a one-inch outside diameter) was the longest tube I could practically use, and that length tube created a D a ninth above middle C (D5), so I constructed my scale with the just equivalent of D5 as the lowest pitch.

I couldn't simply drill all of the tubes at the same place. Instead, I drilled each of them at its individual nodal point, which is 22.4 percent from the end of any bar, rod, or tube that is free on both ends. I then put the clapper near the middle, but not exactly on the middle because that would bring out the third partial and would give the tube a zonky sound since the overtones of a tube are not harmonic. So I positioned the clapper in a way that would maximize the fundamental sound and provide the longest ring-time it could possibly have with as little resistance as possible. I discovered that the wood for the clapper had to be the right density. If it was too hard, like teak, it would be clanky, and if it was too soft, like pine, it would not be heard. I found that a wood like cherry or ash worked best for the clapper.

The weight of the wind catcher was also important. I experimented with all that and came up with something that I liked: a musical instrument that was played randomly by wind.

After my initial experiment with aluminum tubes that I salvaged from old lawn chairs, I went to a hardware store and bought shower curtain rods and flag pole material – one-inch aluminum tubing. I made three Chimes of Olympos and put them in my wife's craft show booth in Cincinnati – they sold immediately. I priced them at \$27 and soon realized that should have been the wholesale price; that was my market research and also the beginning of my understanding of how business works. I decided to make wind chimes on a large scale, so in 1979, I moved to Woodstock, NY, and started producing them. My desire to hear an ancient Greek scale eventually led to a full-scale business enterprise called Woodstock Percussion, Inc.; it also gave me insight into the acoustics of percussion instruments.

Now that I had achieved my goal of creating an instrument to hear Olympos' scale, I began to look at the acoustics of the percussion instruments I had been playing all my life to see how this knowledge could improve the instruments or even affect my approach to playing the instruments. Percussion instruments have a full range of overtones from harmonic overtones on the marimba and xylophone to nonharmonic overtones on instruments like drums, cymbals, gongs, and tam-tams. Because of the variety of materials used to make these instruments, the acoustical properties were different from strings and even from the aluminum tubes I had used to make wind chimes.

## **Marimba and xylophone**

Marimba and xylophone bars vibrate in a similar way to strings; however, with marimbas and xylophones, the overtones are determined mostly by carving the underside of the bars. In fact, the only harmonic overtones that exist in these bars are the ones carved into them by the tuner. Most of the early development of xylophones and marimbas was done by the J. C. Deagan company in Chicago. In early Deagan instruments, the fundamental was the only partial tuned – no overtones were tuned. In 1927, Deagan began tuning overtones on marimbas and xylophone bars, and today, most North American and Japanese manufacturers tune their xylophones and marimbas in the ways described below. These tuning systems, however, have not become a universal standard.

Most marimba bars are carved so that the first audible overtone is a harmonic overtone two octaves above the fundamental. Many marimba manufacturers tune the bars to include a few harmonics such as the fourth

harmonic (two octaves above or four times the fundamental frequency). In addition to that, on the lower bars, a major third overtone above the fundamental is also tuned (three octaves and a third above or ten times the fundamental frequency). Therefore the predominant partials tuned on the lower marimba bars are the first, fourth, and tenth harmonic partials. Other harmonics are generally not tuned and currently do not exist on most marimba bars. This tuning gives the marimba its distinctive timbre; it also reinforces the tone so that the bars sound a lot clearer and the low octave can be heard more easily.

Some of the most remarkable things about the sound of a marimba bar are the various modes of vibration – longitudinal, torsional, lateral, and transverse – all of which make up the timbre of the instrument. With longitudinal vibration, the bar gets longer and shorter – it's unbelievable to think it's doing that. This vibration creates a really high pitch that we are probably not hearing. With the torsional mode, the bar is actually twisting side to side, like wringing out a face cloth back and forth. Another mode of vibration is the lateral mode that is a side-to-side vibration that sometimes interferes with the first overtone in the lower range. In order to lessen the effect of this latitudinal vibration, a V cut is often made on the underside of the marimba bar. This prevents the vibrating bar from interfering with the first overtone and allows the bar to ring more. The transverse mode is the main mode of vibration, and it determines the fundamental and harmonics that are tuned into the bars.

In a xylophone, the bars are carved in a method known as quint tuning. The first overtone that is tuned is an octave and a fifth above the fundamental ( $f_3$ ) or three times the frequency of the fundamental. A strong fifth is heard giving the xylophone a different timbre from the marimba. In addition, the fundamental ( $f_1$ ) and fifth ( $f_3$ ) are odd-numbered harmonics, and these odd-numbered harmonics are amplified by the resonator that is under each bar. The resonators underneath marimba and xylophone bars are closed at one end creating an acoustical phenomenon that amplifies the odd-numbered harmonics. In a marimba bar, the first overtone that is tuned is two octaves above the fundamental ( $f_4$ ) – an even-numbered overtone. This amplification by the resonator on the marimba gives it a more pure sound than the xylophone. Ironically, while making the sound of both the marimba and the xylophone louder, the resonators shorten the ring-time of the bars a little as they steal energy from them through entropy.

With some basic information about the acoustical properties of a marimba or xylophone, you can make adjustments in your playing technique to achieve a desired sound. For example, if you want to get a very flat, pure sound on the low part of a marimba, you use really big, soft mallets and

strike the bar just off center, so you are getting mostly the fundamental sound; that makes the sound blend more. But if you want the sound to stick out of the texture, you use not quite as big a mallet and strike the bar a little closer to the nodal point of the fundamental in order to bring out the harmonic overtone – the first overtone, which is two octaves above the fundamental. On the low bars of the marimba where the tenth harmonic partial is tuned, you play in the center for more harmonic content, but you have to play with a smaller mallet in order to bring out the partial that has the third of the scale in it. We all know that mallets make a difference, and the reason is because they change the timbre of the instrument. A bigger mallet mutes the overtones, and a harder mallet brings out less of the fundamental, emphasizing the overtones.

In addition to using a variety of mallets, you can also experiment with the place you strike the bar in order to bring out different overtones. In playing a piece with a pedal point, like the first movement of the Bach *Suite for Unaccompanied Cello* in G, if you play the pedal tone in the middle of the bar and play near the nodal points on the upper notes, you will bring out a bass line that contrasts with the other notes. In any piece you play, there might be some lines in which you want to bring out the overtone and other lines in which you want the timbre to be flat. These kinds of adjustments can make a huge difference in the sound of the piece.

## **Glockenspiel and chimes**

The bars of glockenspiels produce such high frequencies that overtones are presently not tuned due to the fact that most of the overtones are out of the range of human hearing and do not play an important part in its timbre or sound quality.

Tubular chimes are a very special case in that the sound is known to have a quality called a “missing fundamental.” The actual sound of the note of a tubular chime is not vibrating in the air but is rather a result of our ears combining the overtones closely related to harmonic partials which creates a virtual fundamental. The pitch we hear on a chime is the principle tone. The fundamental of the chime is an octave lower than the principle tone and does not have enough energy to be heard. Partial two, three, and four are close enough to being harmonic that they create the principle tone in our ear that is perceived by our brain as the musical pitch that we hear.

I was convinced that this was the case in a laboratory experiment when a chime tube was struck and the spectrum was shown on an oscilloscope screen along with the sound of an electronic tone generator matching the same fundamental pitch of the chime tube. The fundamental and its

partials were represented on the oscilloscope screen until the tone generator was turned off. The fundamental disappeared from the screen while the fundamental of the chime was still heard.

## **Tam-tams, gongs, and cymbals**

Tam-tams and cymbals yield many nonharmonic overtones and are considered non-pitched due to the multitude of modes of vibration, many of which have similar amplitudes (volume). Gongs, with the raised boss in the middle, emit a strong fundamental pitch and are considered a tuned percussion instrument.

Tam-tams, gongs, and cymbals vibrate similarly to a string, but the vibrations are like thousands of strings in a circle with the middle of the circle going back and forth while the edge of the instrument is pivoting. In addition, the modes of vibration break up into pie shapes in which four segments vibrate alternately, then eight segments, sixteen segments, and so on. In tam-tams, gongs, cymbals, and even drums, there are also circular sections of vibration in which the instrument is vibrating back and forth as one big circle and simultaneously in concentric circles.

## **Drums**

All kinds of drumheads, like tam-tams and cymbals, have multiple types of vibrations, both circular and radial. The center of a drumhead is the antinode for the lowest frequency. It is a place we do not usually play because it creates a low thud causing the sound to die out quickly. On a timpani head, that low thud is actually the fundamental pitch, a sixth below the pitch that we hear as the true pitch of the drum. When a timpani head is struck on the normal beating spot, the overtone that is heard is the principle tone, not the fundamental of the head. Rossing found that the bowl of the timpani helps diminish the fundamental; it kills that vibration so you hear mainly the principle tone. The fifth of the musical scale is also a prominent overtone in timpani. The timpani head sounds most in tune when the principle tone and the overtone a fifth above the principle tone are heard clearly.

### ***Mallet Phase***

My latest experiment in designing instruments with just intonation is an instrument I built for a new arrangement of Steve Reich's *Piano Phase*, called *Mallet Phase* (see Figure 4.1). I have played this piece many times in



**Figure 4.1** Garry Kvistad with *Mallet Phase* instruments and Olympos wind chimes.

the *Marimba Phase* version, but I wanted to hear what it would sound like in just intonation and on different materials.

For the first section of the piece, I built an *amadinda*<sup>4</sup>-style xylophone out of five pieces of cherry wood that are between 17 and 26 inches long, 3.25 inches wide, and 2 inches thick. I tuned the bars to the just intonation equivalent of the five pitches in this section of the piece: E, F#, B, C#, and D, beginning a third above middle C. The second partial was tuned an octave and a fifth above the fundamental as in the Western xylophone (quint tuning). I built a stand for the bars and mounted PVC resonators tuned to the pitch of each bar. To play the bars, I used large wooden dowels made from a Chinese soft wood and struck the bars on the ends at a forty-five degree angle (as one would normally play on an *amadinda*). As with all percussion instruments, the beaters had to be softer than the bars to keep from chipping them.

For the second section of the piece, I tuned aluminum tubes in just intonation to the required pitches: E, F#, A, B, C#, D, and E, beginning a third above middle C. The tubes are between 24 and 35 inches long, with 0.25-inch thick walls, and an outside dimension of 1.75 inches. Again, I built a separate stand for the tubes with built-in PVC resonators tuned to the pitch of each bar, and the tubes were played on their ends with the wooden dowel sticks as well.

My original idea for the third section of *Piano Phase* was to use slap tubes, pieces of PVC tubes tuned in just intonation and played with foam paddles on the top of each tube. I tuned these slap tubes to the required pitches for the last section: A, B, D, E, starting a sixth above middle C.

I recorded *Mallet Phase* with Russell Hartenberger in a studio in Toronto. We sent a copy of the recording to Steve Reich who liked the piece, but felt the third section with the slap tubes was a much weaker sound than the *amadinda* bar and aluminum tube sections. We agreed with Reich's comment, so I made additional *amadinda* bars in order to play the last part of the piece on the wooden bars, giving it a stronger feel. To create a different timbre from the first section of the piece, we played the *amadinda* bars with large, yarn marimba mallets, not on the ends, but on the top of the bars as one would strike a marimba bar. Since resonators amplify the odd-numbered overtones of quint tuning, the wooden bars were amplified even more, and the psychoacoustics of the instrument were enhanced by the brilliance of the overtone.

### **Pulse to pitch**

The sonic phenomena in *Mallet Phase* are quite beautiful, and the rhythmic complexity of the music relates to my interest in acoustics in yet another way – the connections of pulse to pitch and polyrhythms to intervals. When you play a steady pulse, you are actually playing a very low pitch. For example, if you play a pulse at m.m. = 120 and double the speed five times, you create a pitch that is 28 cents lower than C2, two octaves below middle C. Polyrythms are slow intervals. When you play a polyrhythm, you're playing two pulses and, depending on what the relationship is, you're playing a musical interval of some sort.

In the natural overtone series, when you hear the fundamental (f1), you also hear the second partial (f2) vibrating, and you also hear the third partial (f3) vibrating. When you play f2 and f3 together, you create the interval of a fifth. So the relationship musically speaking of a fifth is three pulses to two pulses: 300 vibrations per second is one pitch and 200 vibrations per second is another pitch, and together they create an interval of a fifth. Every interval that we know has a ratio that goes with it, and they are identical to polyrhythms.

When I was studying acoustics, I understood this principle conceptually, but I actually wanted to hear a polyrhythm become an interval. In order to prove this theory, I took two temple blocks tuned to different pitches so I could hear the difference and played three against two on them at a steady tempo for about forty-five minutes. I recorded it on a tape deck at the slow speed of 3¾ inches per second (ips) and played it back at the higher speed of 7½ ips. This tape transference immediately doubled the speed and brought it up an octave, but it still sounded like a polyrhythm. So I dubbed it onto another tape deck at 3¾ ips and kept bouncing it back

between the two speeds until I transferred it seven times. At the end of that process, I had about five seconds of sound, but I could hear that it created a perfect fifth. That was a real “aha moment” for me, and I had my proof. A few years later, I commissioned someone to write a computer program that allows me to tap a polyrhythm on the keyboard and speed it up many times until an interval is created.

## Conclusion

My study of the science of sound has led me in directions I never imagined when I began my journey to hear an ancient Greek scale. It has taken me from repurposed timpani sticks and salvaged pieces of aluminum to wind chimes and the creation of an instrument to reimagine a work by one of the great composers of percussion music. My basic knowledge of the acoustics of percussion instruments has given me insight into the sounds that I can produce on percussion instruments, and as a result has enhanced my entire approach to both listening and music-making.

## Notes

1. H. Partch, *Genesis of a Music* (New York: Da Capo, 1974).
2. T. Rossing, *Science of Percussion Instruments* (Singapore: World Scientific, 2005). For additional information on percussion acoustics, see: *The Science of Sound* (Boston, MA: Addison-Wesley, 1990); and T. D. Rossing, J. Yoo, and A. Morrison, “Acoustics of Percussion Instruments: an Update,” *Acoustical Science and Technology* vol. 25 (2004), 406–12.
3. For additional information about just intonation, see: D. B. Doty, *The Just Intonation Primer: An Introduction to the Theory and Practice of Just Intonation* (San Francisco, CA: Just Intonation Network, 1993); and K. Gann, “Just Intonation Explained,” [www.kylegann.com/tuning.html](http://www.kylegann.com/tuning.html).
4. For a detailed description of the *amadinda*, see: G. Kubik, “The Phenomenon of Inherent Rhythms in East and Central African Instrumental Music,” *African Music Society Journal*, vol. 3, no. 1 (1962), 33–42; and Kubik, *Theory of African Music*, 2 vols. (University of Chicago Press, 1994).

## 5 The percussion industry

RICK MATTINGLY

Although the drum is considered the oldest musical instrument (aside from the human voice), much of the equipment used by modern drummers and percussionists is of relatively recent design, compared to such instruments as trumpets, violins, or clarinets, which have remained largely unchanged for well over a century. Percussion instruments, however, have continued to evolve, not only in terms of materials and manufacturing processes that have resulted in more consistent and durable instruments, but also in regard to innovations that have affected how and what musicians play. The result is a sizable percussion industry that ranges from large corporations that make a wide range of instruments to cottage industries that specialize in just a few products, or even a single product. While the manufacturers have often been the pioneers in terms of materials and workmanship, innovations in the instruments themselves and in the development of new instruments have largely been driven by the players.

### Drum set innovations

One of the first inventions that had a significant effect on how drummers played was the bass drum pedal. Prior to the early twentieth century, bands typically had two drummers: a snare drummer and a bass drummer. When bands played inside in smaller areas, and as bands started playing in pits for vaudeville shows and silent movies, space became an issue and ways were sought to get by with fewer musicians. Various drummers rigged up mechanical bass drum beaters that could be operated with a foot pedal. The most successful design was patented by William F. and Theobald Ludwig in 1909 and remains the basis of modern bass drum pedals. The brothers started the Ludwig and Ludwig company to market their pedal, and that business grew to encompass a full range of drums and percussion instruments.

In light of later history, if a strong musicians' union had existed in those days, use of a bass drum pedal would likely have been banned, as it effectively put half the drummers out of work. But it led to the development of the modern drum set, which allowed a single, seated drummer to play a collection of drums and cymbals, along with various sound effects. The hi-hat pedal evolved from various predecessors that allowed

drummers to play a pair of cymbals with a foot pedal, and after drummers started hanging crash cymbals around their kits and “riding” on them to maintain a pulse, rather than using press rolls on the snare drum, cymbal companies began making larger and thinner cymbals that better suited the new style that was developing. That style became the basis of the drumming that drives popular music genres including jazz, blues, rock and roll, funk, and country music.

Most of the innovations in the development of the modern drum set came from drummers. In the late 1940s, after World War II, Fred Gretsch Jr., president of the Gretsch Drum Company, called a meeting to discuss the future of the company. Former Gretsch employee Duke Kramer recalled that meeting in a 1984 *Modern Drummer* article: “We all decided that we wanted to develop Gretsch into a major line. After the meeting we split up into two-man teams. We covered every major nightspot in New York that we could find and asked the drummers what they wanted in a drum.”<sup>1</sup> Among the drummers’ requests were smaller drums that could be carried around more easily, and hardware that was easier to set up and take down. That led to Gretsch being the first to offer twenty-inch bass drums and the invention of shell-mounted tom-tom holders and cymbal arms, as well as disappearing spurs.

One of the people at the Gretsch meeting was Phil Grant, who had been a drummer with the Pittsburgh Symphony and the Edwin Franko Goldman band. He was also an avid jazz fan who frequented New York nightclubs and knew many of the drummers. “Fred [Gretsch] was a very nice man, but he was not a musician,” recalled big-band drummer Louis Bellson. “He was a businessman – a very smart one and a very good one. Whenever I went to Brooklyn [where the Gretsch factory and offices were located], Fred would always ask, ‘Do you have any problems?’ If he didn’t understand something, he would turn to Phil Grant and say, ‘Well, Phil, this is your department. If you think it is right, go ahead and do it.’”<sup>2</sup>

Among the products that Gretsch developed based on drummers’ ideas was an adjustable bass drum tone control, which came from Jimmie Pratt, and single-headed tom-toms, which was requested by jazz drummer Chico Hamilton in the 1950s, long before rock drummers of the 1960s began to favor them. One of Bellson’s requests was for a kit with two bass drums. While promoting the use of two bass drums would seem to have been a great marketing ploy for a drum manufacturer, several drum companies Bellson had previously approached were not interested. “Phil looked at my design,” Bellson recalled, “and said, ‘That’s pretty wild, but I don’t see why it can’t work.’ So they built the first one for me.”<sup>3</sup>

Despite Bellson’s prestige, double-bass drums were considered a novelty for many years, with very few drummers incorporating a second bass drum

into their setups. But in the 1960s, double-bass setups became more common after such popular rock drummers as Cream's Ginger Baker and The Who's Keith Moon used double-bass kits. The use of two bass drums allowed drummers to play patterns that would have been impossible with one drum. But, as with the invention of the original bass drum pedal and the request from jazz drummers for smaller bass drums, space became the motivation for another invention: the double-bass drum pedal. Some drummers wanted to play the double-bass patterns that were becoming popular, but they didn't have room for two bass drums (or didn't want to haul or couldn't afford another bass drum). Some drummers tried putting two bass drum pedals on a single drum, but because of the curvature of the bass drum rim and the awkwardness of having both of the player's legs next to each other, that proved impractical. Finally, in the early 1970s, the Zalmar company marketed a double pedal on which the beaters were side by side, but one pedal was in the normal position and the other pedal was a couple of feet to the left, where it could be placed next to the hi-hat pedal so a drummer could easily move his left foot from one to the other. This was another example of drummers creating a demand for a product that previously did not exist. Soon, most major drum companies were marketing double pedals, and more drummers started playing patterns that would have been impossible with a single pedal.

In the 1950s, jazz drummer Art Blakey – perhaps inspired by his trip to Africa, where many instruments are fitted with appendages that make them buzz or rattle – started hanging his key ring from the wing nut of his ride cymbal stand so that after the cymbal was struck, the keys would continue to vibrate against the cymbal to extend the shimmering sound. Other drummers experimented with similar ways to create that effect, with one of the most popular being to hang a beaded metal chain (the type commonly used to hold bathtub stoppers) from the wing nut. Some drummers went as far as to drill holes in their cymbals and insert nails that would buzz when the cymbal was struck. Soon, all the major cymbal companies were manufacturing “sizzle” cymbals that had rivets inserted in holes. Sizzle cymbals enabled drummers to get a more legato sound from ride cymbals and increase the sustain of a crash cymbal.

## **Latin percussion instruments**

Martin Cohen, founder of Latin Percussion, was not a musician, but he loved Latin music and spent a lot of time at Cuban dance halls in New York. He was particularly impressed by bongo player Jose Mangual, so he decided to acquire a set of bongos, but, “The U.S. had initiated an embargo of Cuba, and that's where the good bongos, congas, and cowbells had

always come from,” Cohen said in a 1989 *Modern Drummer* article. “So I decided to make my own.”<sup>4</sup> Cohen did not own the necessary equipment to make the bongos himself, but with his degree in engineering, he was able to design them and hired a wood turner to machine the instruments, which he ended up selling. “By doing that I initiated a business,” he recalled. “I started putting bongos in stores on consignment. I was getting a lot of satisfaction from serving the needs of the Latin percussionists.”<sup>5</sup>

The Latin music scene was small in the early 1960s when Cohen began making bongos, and although a few jazz artists used Latin rhythms on occasion, the instruments had not found their way to rock and roll, so Cohen’s customer base was limited. But CBS studio musician Specs Powell asked Cohen to make him a pair of bongos, and he wanted them mounted on a stand – which was unheard of in the Latin music community. “But he was so insistent that I devised a bongo mounting bracket that we sell to this day,”<sup>6</sup> Cohen said.

That small innovation led Cohen to a much bigger development when Powell introduced him to another prominent studio drummer, Bobby Rosengarden, who challenged Cohen to make a jawbone that didn’t break. Cohen had never seen a jawbone used as a musical instrument, but he found out that a jawbone “was an animal skull that you would strike, and the sound would come from the teeth rattling,” Cohen said. “So I took that concept and invented the Vibraslap.”<sup>7</sup>

Rosengarden then asked for a cabasa that wouldn’t break. At the time, cabasas were typically made of gourds with shells or beads wrapped around them with wire. They were very fragile, and the wire often broke. Cohen wrapped bead chain around the kind of textured metal he had seen on the walls of elevators, and his Afuché/Cabasa became his most successful patent in terms of sales.<sup>8</sup>

Some of Cohen’s products were originally greeted with suspicion by the Latin community, such as fiberglass conga drums and the Jam Block – essentially a woodblock made of plastic. But the quality and sound of the products made believers out of the doubters, and the availability and affordability of Cohen’s products led musicians in other genres to start coloring their music with instruments that had previously been impractical due to their scarcity (e.g., a jawbone), their fragility (cabasa), or their lack of volume (woodblocks and wooden congas).

## **Plastic drumheads**

Similarly, it’s hard to imagine how rock drummers of the 1960s and beyond could have done what they did without the development of the

plastic drumhead in the 1950s. The problem that the primary developers of the plastic head sought to solve was that calfskin heads constantly had to be tuned because humidity made them stretch and dry weather made them shrink (and often split). Plastic heads were not affected by weather, but drummers discovered that they were stronger, too. As rock and roll got louder in the 1960s, drummers found that they could hit plastic heads harder. Pretty soon, though, they were even breaking plastic heads, so companies like Remo and Evans developed double-ply heads for added strength. After drum corps started tensioning heads as tightly as possible to get an extremely dry, high-pitched sound (and breaking them), the drum-head companies began making heads from Kevlar – the material used in bulletproof vests. Those heads could be tensioned so tightly that drum shells and tension casings started breaking, so the drum companies built stronger drums to accommodate the new heads. Meanwhile, as kit drummers experimented with various types of muffling (e.g., tape on tom heads, pillows inside bass drums), the companies responded by developing heads that produced the sounds drummers were looking for without having to use external muffling devices.

So it was a back-and-forth relationship between the companies and the musicians. Drummers did not specifically ask for plastic heads, and many drummers rejected them at first. But after Remo and Evans began making them, drummers found that not only did they solve the problems created by humidity (or lack thereof), but since the drums could be tuned with more precision and tensioned more tightly, drummers could hit harder and use techniques that were not practical with calfskin heads, such as modern rudimental players incorporating “buzz roll” effects on their high-tension heads.

### **Xylophones, marimbas**

Likewise, makers of xylophones and marimbas started experimenting with synthetic bars in the 1970s. One reason was that the rosewood favored for those instruments was becoming harder to get and more expensive. Also, like calfskin drumheads, rosewood was relatively fragile and had to be protected from the weather. So around the same time in the 1970s, the Musser and Deagan companies developed synthetic bars for xylophones and marimbas. At first, many players complained that the synthetic bars lacked the rich tone that rosewood produced. But synthetic bars allowed for less-expensive instruments, and they were much sturdier, so those instruments became popular in schools and enabled more students to afford a personal instrument. And because synthetic bars were unaffected

by weather, marching bands and drum corps started taking them outside, lining them up on the edge of football fields, and incorporating keyboard percussion into their marching shows, leading to the development of the marching percussion “pit.”

## **Sticks, mallets**

Some of today’s large-scale percussion manufacturers started out with percussionists just making products for their own use. Vic Firth began by making his own timpani sticks to use with the Boston Symphony. When some of his students asked if they could buy some of his sticks, he made a few more, then added orchestral snare drum sticks. A couple of specialized drum shops offered to sell them, the business grew, and today Vic Firth is one of the world’s largest manufacturers of sticks and mallets.

When Leigh Howard Stevens was in college, he didn’t like rattan marimba mallets and he also wanted longer mallet shafts to accommodate the grip he was using. He bought some dowel rods and began making mallets in his college dorm room, with no desire whatsoever to go into business. But, as with Firth, a few people asked Stevens if they could buy some of his mallets, and he gradually built a mallet and stick business that today includes the manufacture of marimbas, xylophones, and vibes, as well as the publication of method books and music.

## **Percussion manufacturers**

The percussion industry has changed over the years, much like other industries. In the 1980s, one could attend a music trade show and speak directly with some of the people whose names were on their products: Remo Belli at the Remo drumhead company; Armand Zildjian at the Zildjian cymbal company; Bob Zildjian at the Sabian cymbal company (named after his children SA-lly, BI-lly, and AN-dy); William F. Ludwig Jr. and III at Ludwig Drum Company; Joe Calato at Calato drumsticks; Vic Firth at Vic Firth drumsticks; and Robert and Toomas Paiste at Paiste cymbals. You could also talk to Martin Cohen at Latin Percussion, who didn’t name his company after himself, but put his name on his products’ logo badges. “I had seen David Brown’s name on the label of an Aston Martin car,” Cohen said, “and that told me that someone named David Brown had designed that car, and that he had put his name on it to be accountable. So I put my name on the LP labels for the same reason – so that somebody would always know who to complain to if the product failed.”<sup>9</sup>

Even if the founders of the companies were no longer around, many of the leading products and companies bore the name of individuals: Clair Musser; J. C. Deagan; Bud Slingerland; Fred Gretsch. But in the 1970s, products began emerging with names like Pearl, Yamaha, and Tama, which were brand names owned by companies that often made other instruments besides drum and percussion gear. That wasn't necessarily unprecedented or bad; Gretsch was as highly regarded for its guitars as for its drums, and larger companies often had more resources that led to higher manufacturing quality.

There are still privately owned drum and percussion companies run by the individuals who started them, such as Marimba Productions/Mallettech run by Leigh Howard Stevens, Drum Workshop (DW) run by Don Lombardi, Marimba One run by Ron Samuels, and Aquarian Accessories run by Roy Burns, among others. In addition, some of the original owners are still involved with their companies (as of 2015) to varying degrees, such as Remo Belli and Martin Cohen. In other cases, the founders' descendants are heading the companies: Armand Zildjian's daughters run Zildjian; Robert Zildjian's son runs Sabian; and a nephew of Fred Gretsch runs Gretsch. But more and more small companies are being absorbed into larger ones, larger companies are merging, and more decisions are being made by business people than by musicians.

According to John DeChristopher, vice-president, Artist Relations and Event Marketing Worldwide at Zildjian from 1989 to 2014,

There has to be some involvement by drummers. At one point, it was mostly drummers at the major drum and cymbal companies making the important decisions about products. These days there are more business people involved. But there have to be some players in the mix, because this is a very unique business. It's not like selling vacuum cleaners. Some people might assume that you can apply one set of business standards to another business and it will be fine, but we've all seen examples of those kinds of mistakes. A lot of companies today are being run by non-musicians, and things are heading in a corporate direction. But it's very important for companies to not lose sight of the fact that musicians are very unique in what they like and think and feel. Drummers have a very tribal type of relationship with each other, and you can't put a corporate spin on something and think that drummers are going to buy it.<sup>10</sup>

The story of the Rogers Drum Company illustrates what can happen when business and marketing people run companies and don't listen to the musicians. Rogers was started in 1849 by an Irish immigrant named Joseph Rogers. In 1953, after he died, the company was sold to Henry Grossman, who, with designer Joe Thompson and marketing manager Ben Strauss, elevated Rogers to one of the major drum companies by the mid-1960s by virtue of innovative products like the Dyna-Sonic snare drum and Swiv-o-

Matic pedals and hardware. In 1966, the company was bought by CBS, who also acquired Fender guitars and Rhodes electric pianos.

Drummer Roy Burns was involved with the company as an endorser, clinician, and employee. Today, Burns heads Aquarian Accessories, which manufactures drumheads and other percussion products. “One of the things I realized that made me go in business for myself was that you have to have a musician in a position of power in a company,” he said. “He doesn’t have to run everything, but he has to have influence on the products. If the marketing guys or the factory guys or the R&D guys get control, the product ends up suffering because there is no one to say ‘No, that’s not good enough.’”<sup>11</sup>

Burns cites the Rogers bass drum pedal as an example: “Rogers had the best bass drum pedal on the market. Buddy Rich was a Ludwig endorser, but he used a Rogers bass drum pedal any time Bill Ludwig wasn’t in the room. Well, after CBS bought Rogers, they decided to replace the needle bearings in the bass drum pedal with nylon bearings. They said no one would be able to feel the difference.” In fact, the nylon bearings changed the feel entirely, giving the pedal less range of motion and less smoothness. Dealers started returning pedals “by the barrelful,” as Burns put it, and the word got out that Rogers’ pedals were no good any more. “It killed the product,” Burns said, “and they were never able to revive it. They changed the bearings to save money, but they were making a profit on the pedal; they didn’t need to save money.”<sup>12</sup>

Burns said another situation that led to the company’s downfall was that the Rogers accountant insisted that the company not order materials until they had orders for products. “When Rogers introduced an 8-ply shell, that was a wonderful product and no one else had anything like it,” Burns says. “They announced it in October, orders poured in, but by December they still hadn’t shipped any drums, so the orders got cancelled.”<sup>13</sup>

Burns cites Henry Grossman as the one responsible for the innovations that originally put Rogers on the map. “He was a real visionary, and he let his people develop creative ideas. He told me one time, ‘Roy, always stick with quality and you’ll end up better off in the long run.’ I took that very much to heart, and Aquarian has been in business for thirty-five years. I tell people I’m the ‘safety net’ of the company. If I don’t like it, we keep working on it until we get it right.”<sup>14</sup>

## **Artist endorsements**

Although many companies are not headed by musicians or have many musicians as employees, most companies have artists who endorse their

products, and those players often participate in new product development and refinements of older products. “Endorsement deals are unique for some artists while generic for most,” says jazz drummer Peter Erskine. “By ‘generic,’ I mean that the ‘usual’ norms will apply: a music company enlists the name, image and reputation of an artist and, in return, supplies that artist with equipment. The benefits are obvious: the artist receives equipment and musical instrument support, plus marketing promotion in the form of advertising, prestige by affiliation with the company and their other artists, plus logistical support while traveling. The one disadvantage to having an endorsement deal,” Erskine adds, “is that the artist is more or less locked into playing that brand of instrument. Non-endorsed musicians can play whatever they want – total freedom! But freedom comes at a price – in this case, the cost of purchasing that instrument. There are no free lunches in this world. But that’s okay.”<sup>15</sup>

In the early stages of an artist’s career, an endorsement can be more beneficial to the artist than to the manufacturer, as an up-and-coming artist will not be giving the company’s products a whole lot of exposure. But the artist will be getting free or discounted equipment, as well as the “cred” that comes from having an endorsement deal (or two or three). Indeed, while the idea is that an artist endorses a product, young drummers will often put on their resumes that they are “endorsed by” a certain company.

Artists looking for credibility will often seek deals with the manufacturers whose artist rosters include some of the biggest names in drumming and percussion, but some prefer to sign with smaller companies who will give them more attention. That can often pay off in terms of the small company featuring the artist in ads or with clinic support. It can also result in exposure at large festivals, such as the Percussive Arts Society International Convention (PASIC) and the *Modern Drummer* Festival Weekend (no longer held). As *Modern Drummer* vice-president Kevin Kearns explains, “When selecting artists for a festival-type show, the producer of the show must balance the artists, the musical styles desired, and the companies the artists endorse, because when the producer is relying on endorsing companies for support, the producer cannot have one instrument manufacturer significantly represented over its competitors.”<sup>16</sup>

While prominent artists typically have several endorsements (e.g., a drum company, stick company, cymbal company, and drumhead company), those who appear in multiple ads in magazines also endorsing cases, microphones, various electronic devices, auxiliary percussion instruments, and so on can earn the label “professional endorser” from their peers. That label can also be applied to once-prominent musicians whose playing

careers have faded but who are more prominent than ever in equipment ads, often with smaller companies.

Musicians can also be criticized for switching endorsements. What is one to think if a player sings the praises of a particular instrument company for several years and then suddenly (so it seems) switches to another brand? In some cases, a change in company management can result in certain artists being “let go,” just as when prominent artists lose record deals. Peter Erskine offers some other reasons that artists may feel compelled to switch companies:

I started out playing a Gretsch kit as a kid, switched to Ludwig in high school, and began playing Slingerland drums while a member of Stan Kenton’s Orchestra in 1973. By 1981, I was a Yamaha artist. Twenty-five years later, I switched to Drum Workshop. Eleven years after that I changed to Tama. Why? Here’s where the endorsement equation gets interesting. Endorsement relationships involve more than just free gear, clinic support, advertising, logistical assistance, and the like. The quality of communication and personal relationships between artists and their companies are often the most vital and important components of successful endorsement relationships. And these relationships often falter, more often than not due to a lack of good communication between the artist and the company. Artists are, by their very nature, thoroughbreds, vain stallions, pains-in-the-neck, and invaluable resources to any company. The artist-relations manager at any company has a crucial role in maintaining a healthy ecosystem between the artists and the company. Easier said than done in many cases, as my jumps from one drum company to another may attest.

All of that said, my quest has been centered upon finding the instrument I truly want to play: the instrument that responds the best to my touch and that excites and inspires me to play my possible best – the very same qualities that every musician is looking for when he or she walks up to any instrument and begins to play it. Ultimately, it’s all about the music.<sup>17</sup>

Endorsement deals can have a significant effect on a musician’s finances. For drummers who break a lot of sticks and/or drumheads, endorsements with drumstick and drumhead manufacturers can help ensure that the drummer always has plenty of sticks and heads on hand. Even if the company will only provide a certain amount of free gear per year, endorsers can typically purchase additional items from the company at less cost than the price they would pay at a music store. As another example, musicians who frequently perform in other countries can rarely afford to ship their equipment around the world for tours of one-nighters. So they typically sign with companies that can provide equipment in a wide variety of locations.

It has been rumored for years that in addition to providing gear and clinic support, some artists have been paid to endorse a particular brand of

instrument. Mel Lewis insisted that during the 1950s and 1960s, no one was ever paid by Gretsch. “They gave you drums and cymbals, and you could always stop by the factory if you needed sticks or brushes,” he said. “But they didn’t give you unlimited equipment; in fact, when you got a new drum set you had to turn in your old one. Gretsch never even paid anyone to play their drums. They even preferred that you already owned a set of Gretsch before they offered you an advertising deal. Fred [Gretsch] wanted to know that you played the drums because you liked them. The only contract you had with Gretsch was that, in return for a set of drums, they were allowed to use your name and picture in their advertising.”<sup>18</sup>

Peter Erskine says he is not aware of any music company that pays an artist to play its instruments, although he heard rumors that Buddy Rich was paid at one time. “The most significant financial arrangement that I’m aware of between some drummers and their sponsoring companies involves the companies providing healthcare coverage to those drummers, much the same as what those companies offer to full-time employees,” Erskine says. “Anyone who thinks that drummers play a particular brand simply for the money – or for money at all, because that is a complete myth – is misinformed, and their opinion is as valid as someone who denies climate change or thinks that the earth is flat. Whatever mythology drummers-at-large wish to believe regarding endorsement deals, there’s one simple fact that seems to get overlooked: all drummers, whether endorsed or not, are fans of the instrument. And, so, most decisions regarding instrument endorsement deals are driven by that youthful, innocent passion and excitement that a great instrument generates.”<sup>19</sup>

According to John DeChristopher, “I’ve heard rumors about people being paid to endorse products, but I can’t confirm that any particular person is getting paid today. There were people in the 1980s and ’90s who were getting paid, but the business has changed a lot since then, and I think even the big companies can’t afford to pay artists to endorse their products.”<sup>20</sup>

One aspect of some endorsement deals is clinic support. Some drummers augment their careers by giving educational clinics at local drum shops as well as at music conventions such as those hosted by the Percussive Arts Society (PAS), the National Association of Music Merchants (NAMM), the Jazz Education Network (JEN), and the Music Educators National Conference (MENC). Depending on the situation, the manufacturer will pay all or some of the endorser’s fees (including travel) and may also take care of all the details of a clinic tour so that the artists’ only responsibilities are to show up and give the clinic. During such clinics, the endorsee is generally expected to sing the praises of the equipment manufactured by whoever is sponsoring the tour. “Contrary to some

perceptions,” says Peter Erskine, “the amount of support for these presentations is generally modest.”<sup>21</sup>

For drummers who have ideas for new products, or variations of existing products, endorsement deals allow direct access to company executives and designers. The companies, in turn, have a direct connection to influential drummers who can advise them on new products and test prototypes. According to John DeChristopher, many new products are a combination of artists’ requests and the company looking to expand its product line by offering new models. “There is no shortage of artists giving their input and ideas,” DeChristopher says. “As an artist relations person, one of my jobs was to make sure there wasn’t an overlap or redundancy in the things artists wanted versus things the company already had that the artists weren’t aware of or that were in development.”<sup>22</sup>

DeChristopher cites Zildjian’s K Constantinople line as an example of how the artists and the company worked together. After the American Avedis Zildjian cymbal company (see Figure 5.1) bought the rights to the K. Zildjian name and trademarks, the American company sought to recreate the sounds of the “old K’s” that had been made in Turkey. “A number of artists had been playing K Zildjians from Turkey, and they were always looking for that ‘old K’ sound,” DeChristopher said. “Zildjian was trying to make cymbals like that, there was some trial and error, and some products came out pretty good, like the Pre-aged K Light Ride. The way the K Constantinoples came about was that Armand Zildjian wanted to improve the orchestral cymbals and made it a top priority. At the same time [Boston Symphony Orchestra percussionist] Frank Epstein was looking for a sound like the old Turkish K hand cymbals, and was involved in testing prototypes. Armand, Lennie DiMuzio, and Paul Francis (whom Armand apprenticed), painstakingly did the R&D, and Lennie sent prototypes to other orchestral cymbal players. The process that was used in developing those cymbals was then transferred to the development of drum set cymbals, and drummers like Jeff Hamilton, Peter Erskine, Adam Nussbaum, Bill Stewart, Steve Smith, and Elvin Jones tested prototypes and helped shape those early K Constantinople cymbals. Since then, Paul Francis has evolved into one of the great cymbal makers and has taken the K Constantinoples to a whole new level.”<sup>23</sup> According to Erskine, “A dynamic endorsement relationship will involve plenty of back-and-forth between the artist and company in terms of product betterment and development. Sometimes this will result in a ‘signature’ product – an instrument or accessory that generates royalty revenue for the artist.”<sup>24</sup>

For many years, the primary signature products were sticks and mallets. It seemed that the majority of prominent players had their name on a



**Figure 5.1** Avedis Zildjian III in front of old Zildjian factory.

drumstick, marimba mallet, or timpani stick. At first, most of the signature drumsticks were simply the standard models, to which the names of the drummers who favored them were added. But gradually players began asking for modifications to standard models – a heavier shaft, a different bead, harder or softer heads on keyboard and timpani mallets, even a different color – and those models became those artists' signature sticks and mallets. Signature products have expanded into almost all areas of the percussion industry (and the music industry in general), and now there are signature snare drums, cymbals, marimbas, conga drums, stick bags, and so on. It is common for companies to charge extra for signature products, and for the artists to receive royalties. Judging by the increasing number of signature items, customers must be willing to pay extra for them.

## Conclusion

While the main goal of a manufacturer is to make money by selling products, the percussion industry is notable for its long-time support of music education. Granted, it's not pure charity, as the manufacturers realize that teaching more people to play results in a bigger pool of potential customers. Nevertheless, the percussion industry's support of the PAS has no parallel in any other instrument family.

"PAS receives tremendous support from the drum and percussion industry in various ways without which PAS could not exist," says PAS executive director Jeff Hartsough. "This includes, but is not limited to, artist support, exhibiting, and providing door prizes at PASIC and state chapter Days of Percussion, advertising, donated instruments for Rhythm! Discovery Center [the PAS percussion instrument museum in Indianapolis], and much more. And, despite the fact that many of the companies are competitors, there can be a surprising level of cooperation between all of them when it comes to supporting PAS and promoting the drum and percussion community at large."<sup>25</sup>

Many of the manufacturers joined together in the 1990s to create the Percussion Marketing Council, which sponsors International Drum Month – an event designed to promote percussion education in cooperation with local music stores. Manufacturers have also sponsored clinicians at such events as MENC conventions, various KoSA events, the Modern Drummer Festival, and at local music stores around the world.

Although some people complain that the modern percussion industry – and the musical products industry in general – is now run more by "suits" (i.e., business people) than by musicians, which is true in some cases, musicians still run a number of companies that produce quality and innovative products, and just about every company is getting feedback and new product ideas from its musician endorsers. As long as product development is driven by the people who use those products, the industry and the players should both benefit.

## Notes

1. R. Egart, "Inside Gretsch," *Modern Drummer*, vol. 8, no. 5 (1984), 20.

2. *Ibid.*, p. 20.

3. *Ibid.*, p. 20.

4. R. Mattingly and A. Budofsky, "Latin Percussion's Martin Cohen," *Modern Drummer*, vol. 13, no. 9 (1989), 32.

5. *Ibid.*, p. 33.

6. *Ibid.*, p. 33.

7. *Ibid.*, p. 33.

8. *Ibid.*, p. 34.

9. *Ibid.*, p. 97.

10. Phone interview with J. DeChristopher (October 22, 2014).

11. Phone interview with R. Burns (September 12, 2014).

12. *Ibid.*

81 *The percussion industry*

13. *Ibid.*
14. *Ibid.*
15. Email correspondence with P. Erskine (December 8, 2014).
16. Email correspondence with K. Kerns (August 3, 2014).
17. Erskine (2014).
18. Egart, "Inside Gretsch," 76.
19. Erskine (2014).
20. DeChristopher (2014).
21. Erskine (2014).
22. DeChristopher (2014).
23. *Ibid.*
24. Erskine (2014).
25. Email correspondence with J. Hartsough (January 11, 2015).

## 6 Virtual drumming

### A history of electronic percussion

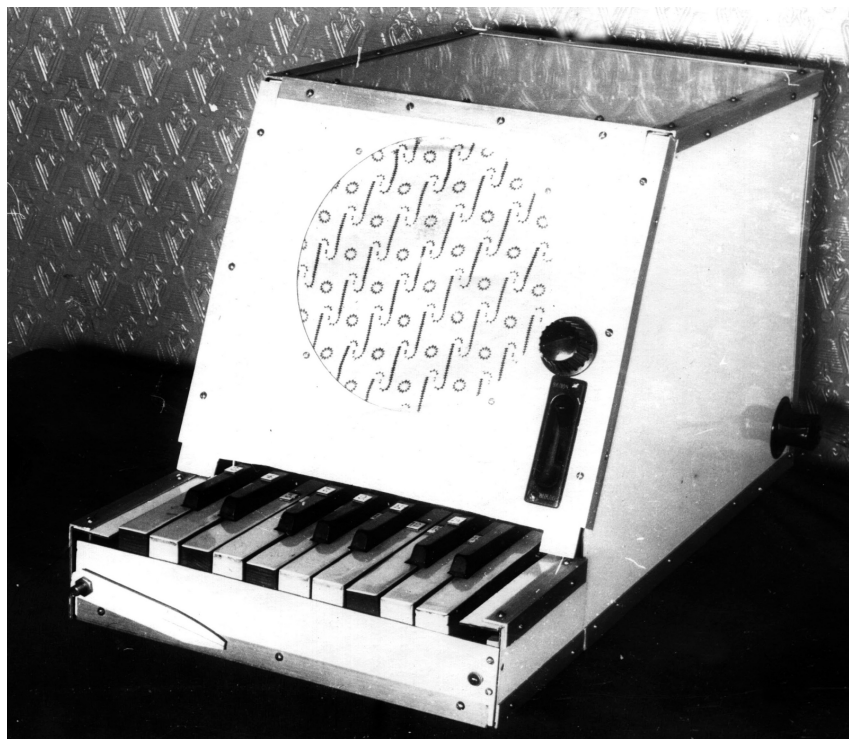
THOMAS BRETT

#### Introduction

One of the notable stories about music in the twentieth century was the emergence of electronic percussion technologies. Rhythm boxes, drum machines, percussion controllers, and software shifted drumming away from acoustic instruments, inspired techniques that shaped the sound of popular music, and foregrounded the aesthetics of groove. This essay traces a social history of electronic percussion instruments from the 1930s to the present by examining their designs, reception, and musical applications.<sup>1</sup> The first section examines early rhythm boxes, influential drum machines from the 1960s, 1970s, and 1980s, and concludes with a consideration of drum pad controllers and software. The second section explores the perceptual and creative changes brought about by these instruments to suggest that the mechanical, quantized sound of drum machines led to a discourse about human versus machine timing. The section also argues that programming techniques enabled musicians to make rhythmic textures unencumbered by the limitations of the drumming body. Finally, the last section considers the legacies of electronic percussion, from performance practices and recent hardware design to the rise of digital percussion apps. In sum, electronic percussion has made significant contributions to the practices and sounds of contemporary music. By offering new approaches for creating rhythms, the technologies redefined what it means to drum and thereby led musicians to think about what is human in music.

#### A history of electronic percussion

The story of electronic percussion begins in the early 1930s, when the American composer Henry Cowell sought a machine that could generate complex polyrhythms. In 1931, Cowell commissioned the Russian inventor Léon Theremin to build him a device that would assign rhythms to pitches. Theremin created the Rhythmicon (see Figure 6.1), a mechanized optoelectronic instrument with a one-octave keyboard and speaker



**Figure 6.1** Rhythmicon built at the Acoustical Laboratory at Moscow Conservatory in the mid-1960s as part of Léon Theremin's research project. It is in working condition and in the collection of Andrey Smirnov.

housed in a large wooden box. When pressed, each key produced a pitched tone that repeated in a steady pulsation. Cowell hoped to use the Rhythmicon in his music to play multiple rhythms simultaneously and thus transcend the limits of human musicianship, believing that “further rhythmic development . . . needed the application of mechanical aid.”<sup>2</sup> Critics who heard the Rhythmicon's debut demonstration at The New School in 1932 noticed the potential and limitations of mechanical rhythm. For Homer Henly, the “rhythmic control possible in playing and imparting exactitudes in cross rhythms [was] bewildering to contemplate.”<sup>3</sup> Marc Blitzstein anticipated future debates about drum machine timing, noting how the musician “is constrained . . . without deviation from the regular beat.”<sup>4</sup> And Alexander Fried considered the instrument a poor substitute for the natural imperfections of human timekeeping. “Hand-made music will always be the real music,” he said, while “mechanical music at most will be of subsidiary use.”<sup>5</sup> The Rhythmicon – of which only three were made – was soon abandoned by Cowell, yet the experimental device had sparked discussion about issues of performance, rhythmic control, and musical time.

After World War II, as electric organs became widespread in American homes, manufacturers offered features such as one-touch chords and rhythm presets to facilitate playing one-man band arrangements of popular songs. In 1949, an organ-maker named Harry Chamberlin addressed this market with his Chamberlin Rhythmate, the first sample-based rhythm machine. Designed to accompany organ players, this stand-alone instrument used tape loop recordings of acoustic drums playing various rhythms that could be sounded individually or blended together and played back through a built-in speaker. Within ten years, the Rhythmate had motivated the American organ company Wurlitzer to create the first commercially produced rhythm machine, the Side Man. Released in 1959, the Side Man used tube circuitry and a rotating metal disc rather than tape loops to simulate percussion sounds including snare drum, temple blocks, and claves, while its twelve preset rhythm patterns included the beguine, tango, and rumba. Marketed as a “full rhythm section at your side!” that could serve as accompaniment for Wurlitzer’s popular electric piano, the Side Man and its tinny-sounding grooves worried the American Federation of Musicians’ Union, who feared that it “would be used to displace a live performer.”<sup>6</sup> That almost came to pass in 1975 when the Italian producer Giorgio Moroder used a Side Man as a metronome to guide a drummer recording a 4/4 kick drum beat for the pioneering disco song, “Love to Love You Baby.”<sup>7</sup>

Inspired by the functionality of the Side Man, the pace of electronic percussion innovation accelerated in Japan, as the founders of a company that would become Korg Electronics, Tsutomu Katoh and Tadashi Osanai, collaborated on their Donca Matic series of rhythm machines. Released in 1966, the Donca Matic DE-20 resembled the Side Man but used solid-state electronics to create more realistic sounds intended “not just as accompaniment for home organists and light entertainers.”<sup>8</sup> Korg’s Stageman and Mini Pops series soon followed, instruments touted as having “natural metallic percussion” sounds and incorporating controls for drum “breaks and fill-ins.”<sup>9</sup> Alongside Korg’s early innovations, a Japanese engineer named Ikutaro Kakehashi founded Ace Electronics in 1960. Kakehashi also aimed to improve on the Side Man, releasing the solid-state Ace Electronics R 1 Rhythm Ace in 1964 and the FR 1 in 1967. Like the Korg’s Mini Pops, preset rhythms on these units could be combined and, on the FR 1, further modified via mute buttons that silenced various sounds within the patterns to provide the musician with basic programming options.<sup>10</sup> These early Ace Electronics and Korg instruments would soon find their way onto popular music recordings. Robin Gibb allegedly used the FR 1’s slow rock 12/8 rhythm preset on his 1969 pop ballad, “Saved by the Bell,” and Jean Michel Jarre used a Mini Pops on his 1976

electronic instrumental music album, *Oxygène*. To create the beat for “Oxygène IV,” Jarre pressed two rhythm presets simultaneously and then added filtering effects to the drum sounds “in a very subtle way to give life inside the patterns.”<sup>11</sup>

By the late 1960s and early 1970s, numerous music technology companies had introduced rhythm machines similar to those of Korg and Ace. One of these units was used by a Miami lounge musician named Timmy Thomas on his austere 1972 R&B song, “Why Can’t We Live Together,” a sparse arrangement for a preset bossa nova beat, organ chords, and vocal.<sup>12</sup> Two rhythm machines became especially significant due to their adoption by prominent musicians of the era. The Percussion King rhythm machine, released in 1967 by the Vox amplifier company, was used by the pioneering German electronic music group Kraftwerk on their twenty-two minute 1974 piece, “Autobahn.” Kraftwerk’s music, made from drum machines, synthesizers, and sequencers, had a robotic and repetitive sound that would influence the direction of electronic popular musical styles for decades to come. Another unit, Maestro’s Rhythm King MRK-2 that was released in 1970, offered eighteen rhythm presets, among them a disco beat. Sly and the Family Stone used a Maestro on their 1971 album, *There’s a Riot Goin’ On*. Predating Jarre’s use of the Korg Mini Pops and Kraftwerk’s repetitive beats, Stone manipulated what he called his “funk box” by overdubbing presets to make multipart grooves “in place of live drums.”<sup>13</sup> It was around this time that the British psychedelic rock musician Arthur Brown presciently described drum machine technology as freeing “the whole scope of rhythm and [letting] you get into patterns of rhythm that you just can’t get with a drum kit.”<sup>14</sup>

In 1972, Kakehashi left Ace Electronics to found Roland, a musical electronics company whose first products were several rhythm machines such as the TR-66 and TR-77 models, which, following the accompaniment tradition established by Harry Chamberlin and Wurlitzer, were designed for using with home organs. In 1978, Roland released the more sophisticated CR-78 CompuRhythm, the first microprocessor-based unit with thirty-four rhythm presets, controls for accents and muting, and significantly, a memory for storing programmed drum patterns. Unlike Roland’s earlier models, the CR-78 caught on with musicians. For example, it was used to lay the pulse for Blondie’s “Heart of Glass,” a Kraftwerk-influenced song from 1979 that generated controversy by combining a disco preset rhythm with a rock backbeat. As Blondie’s singer Deborah Harry explained the public reaction to her group’s drum machine experiment, “it was very unusual for a guitar band to be using computerized sound. People got nervous and angry about us bringing different influences into rock.”<sup>15</sup> Phil Collins also used the CR-78 on his 1981 song, “In the Air

Tonight.” Like Sly Stone and Blondie, Collins sought a backing rhythm track over which to layer his acoustic drumming. He recalled that the genesis of the song was “a pattern that I took off that CR-78 . . . I programmed a bass drum part into it, but basically the rest of it was already on there.”<sup>16</sup> Collaborating with their drum machines even while perhaps not yet trusting them entirely, musicians were beginning to recognize how the technology could propel their songs by providing steady dance grooves “on which chords and melodies could sit comfortably.”<sup>17</sup>

In the early 1980s, the arrival of digital sampling ushered electronic percussion to a new level of influence and acceptance. In 1980, an American guitarist and inventor named Roger Linn created the first digital drum machine with sampled sounds, the LM-1 Drum Computer, a 5,000 dollar unit that combined twelve percussion samples stored on memory chips with a step sequencer. With a print ad that provocatively juxtaposed the phrase “Real Drums” atop a photo of Linn’s black box, the LM-1 and its realistic sounds gained notoriety. Linn recalled how musicians who heard it for the first time “couldn’t believe the ghost in the machine that sounded like real drums.”<sup>18</sup> In addition to its use of samples, the LM-1 was the first drum machine to feature timing subtleties by way of adjustable quantization and shuffle settings. In the LM-1’s instruction manual, Linn described quantization as “auto-correct,” a feature that corrected for “timing errors made while programming rhythm patterns.” The LM-1’s swing feel or “shuffle” setting softened quantization by shifting “drum entries on to time slots that make the part “feel” more human.”<sup>19</sup> Shuffle added feel by delaying the playback of every second sixteenth-note subdivision by various amounts to alter the degree of swing,<sup>20</sup> an idea Linn would later credit to his work with the pianist Leon Russell, who taught him “about why certain recordings feel right and others don’t.”<sup>21</sup>

The LM-1’s successor, the somewhat more affordable LinnDrum, was released in 1982 and became an essential instrument for pop music session drummers who – thanks in part to the influence of the LM-1 – were increasingly asked to program rather than play their parts. Drummer and drum programmer Jimmy Bralower describes the paradox facing drummers upon the LinnDrum’s arrival: “It was like [producers] wanted the real guy to sound like a machine and they wanted the machine to sound like a drummer.”<sup>22</sup> Recalling Wurlitzer’s Side Man that had once worried the American Federation of Musicians, the digital drum machine was now a legitimate musical threat; the drummer Jeff Porcaro even advised “to get [a LinnDrum] and immediately learn it and know it, because the future of that is real heavy.”<sup>23</sup> Indeed, as Bob Doerschuk observed at the time in *Keyboard* magazine, numerous so-called

“synthesizer rock” bands were turning to drum machines because they allowed “for unvarying sequences of identical percussion sounds and eliminate any possibilities of trance-breaking irregularities in the less dependable hands of human drummers.”<sup>24</sup> With their dependability, convincing samples, programmability, and timing nuances, the LM-1 and the LinnDrum inspired the development of other digital drum machines and shaped the sound of 1980s pop through iconic songs such as The Human League’s “Don’t You Want Me” and Prince’s “When Doves Cry.”

A few months after the release of Linn’s LM-1, Roland unveiled its TR-808 Rhythm Composer in 1980. Intended as a composing and accompaniment tool for songwriters, the unit had twelve synthesized percussion sounds and, like Linn’s machines, step-programming capability. At the time, Roland’s founder, Kakehashi, had envisioned that this programming feature would allow musicians to “slow the tempo down, enter your rhythm events, and then speed it up and hear the realistic rhythm pattern that you had just created.”<sup>25</sup> But despite Kakehashi’s suggestion to sequence “realistic” rhythms, musicians were finding other ways to use the 808. For example, in 1982 Marvin Gaye programmed it to play an unusual beat with nine parts on his R&B hit, “Sexual Healing.” And the instrument’s defining moment arguably occurred that same year at the inception of electro-funk music. DJ Afrika Bambaataa and producer Arthur Baker used an 808 on “Planet Rock,” a track that mimicked the melody and beat of two Kraftwerk songs. Baker notes that when he and Bambaataa used drum machines they “didn’t try to make them sound like real instruments’ but rather embraced them for their futuristic aesthetic.”<sup>26</sup> Using a springy 808 beat that defined the sci-fi sound of electro as a “response to people’s mechanized, postindustrial landscapes,” “Planet Rock” sparked an array of electronic dance music styles, including hip hop, Miami bass, and techno.<sup>27</sup>

By the early 1980s, Roland ceased production of the 808 because the unit had found little commercial success among songwriters; the synthetic tones of the 808 and its successor, the similarly short-lived TR-909, could not compete with the realism of Linn’s digital samples. Roland’s drum machines thus “ended up in pawn shops and second-hand musical instrument stores” where they were soon rediscovered by pioneering techno and house musicians searching for affordable electronic gear.<sup>28</sup> In Detroit, the techno musician Juan Atkins mixed 808 patterns into his DJ sets. Atkins’ Cybotron, a duo influenced by funk, Kraftwerk, and disco, also used the 808 on its 1982 track, “Clear.” Emphasizing the 808’s booming sine tone kick drum and white noise snare drum and hi-hat sounds, “Clear” showed how a single electronic percussion instrument could provide a foundation

for electronic dance music. By the end of the decade, the sounds of the 808 and 909 were established as they propelled techno and acid house music such as A Guy Called Gerald's 1988 track, "Voodoo Ray" and 808 State's 1989 track, "Pacific State." In the mechanized idiom of electronic dance music, the synthetic timbres of Roland's drum machines had found a home and empowered musicians to sound cosmopolitan. As Graham Massey of 808 State puts it, "the technology enabled us to speak a more international language."<sup>29</sup>

While the Roland 808 and 909 were adopted for making electronic dance beats, Roger Linn collaborated with another Japanese company, Akai, on the MPC60 MIDI Production Center, a combined sampler, sequencer, and drum machine. Released in 1988, the MPC was the first electronic percussion unit to have a timing resolution of ninety-six parts per quarter note, sophisticated sampling capabilities, and sixteen small rubber drum pads. In the MPC's user manual, Linn framed the machine as a bona fide, playable instrument with its own criteria of virtuosity. "In the same way a violinist's style is identified by his or her vibrato and phrasing," he wrote, "your MPC60 virtuosity is identified by your particular swing settings. . ."<sup>30</sup> Hip hop musicians who used samples as the basis of their work embraced Linn's notion of the MPC as an instrument and all-in-one production tool. For example, in the 1990s, A Tribe Called Quest, De La Soul, Dr. Dre, and The Wu Tang Clan used the MPC60 and its successor models to make their landmark recordings. In 1996, the American hip hop producer Joshua Davis, aka DJ Shadow, used an MPC to create his sample-based instrumental album, *Endtroducing*. Working exclusively with sounds from old records, Davis referred to the MPC in terms of virtuosity by calling it "the instrument I took seriously in terms of becoming the best at it, or one of the best."<sup>31</sup> Davis and other producers learned to play the MPC, finger drumming on its pads to trigger samples and assemble entire songs.

As musicians adopted drum machines, electronic musical instrument companies began producing stand-alone percussion controllers equipped with touch-sensitive surfaces with sensors to trigger drum sounds. The first commercially available electronic drum was Pollard's Syndrum. Under the caption "percussion will never be the same," the company's 1978 magazine ad suggested that it "is the concept of dynamics and control that distinguishes Syndrum as a musical instrument."<sup>32</sup> Another pioneering controller was Simmons Electronic Drums. Founded in 1978, Simmons manufactured kits with hexagonal plastic pads that produced synthesized and sampled drum sounds. Image-conscious synth pop musicians in the 1980s such as Spandau Ballet and Duran Duran were drawn to the Simmons futuristic design, featuring the brightly colored electronic kits

in their music videos. Simmons also captured the interest of experimentalists in search of novel percussion timbres. Bill Bruford, a drummer who used Simmons pads for his “melody drumming” with the progressive rock group King Crimson,<sup>33</sup> described his interest in an electronic kit that was more than “a facsimile of a drum kit. . . We wanted a new instrument altogether.”<sup>34</sup>

In the 1990s and 2000s, the sound and playability of electronic percussion controllers improved as companies such as Roland and Korg refined their technologies in pursuit of more than mere facsimiles of acoustic instruments. Roland developed its Compact Drum Systems and later V-Drums, an electronic drum set with tensioned drumheads. Korg released its Wavedrum, a slim hand-drum type controller that earned accolades for its drumhead and rim that reacted in a realistic way to a musician’s touch. However, despite their tactile sensitivity and increasingly lifelike sounds, electronic percussion controllers over the past thirty years – from the Syndrum to the Wavedrum – have so far proved less influential than drum machines. Perhaps this is because no matter how sensitive their triggering surfaces and nuanced their samples, emulations of the feel and sound of acoustic percussion remain imperfect. Another possible factor is that as drum machines have enculturated musicians with the idea of programming rather than playing drum parts, drumming no longer requires either a drummer or a percussion controller per se. Nevertheless, some musicians use controllers instead of, or in conjunction with, acoustic drums in order to perform with electronic sounds.

Finally, in addition to controllers, electronic percussion since the mid-1990s has taken the form of computer software. Widely used digital audio and MIDI recording programs such as Live, Logic, and Reason present endless ways for creating beats through virtual drum machines, step sequencing, and sound design. In addition to these programs, dedicated software percussion instruments feature customizable drum kits, percussion sound modules with thousands of samples, and drum loop players. Improving upon the quantization and swing settings of drum machines, these software instruments can convincingly simulate the sound of live performers through randomized rhythmic nuances. For example, Spectrasonics’ *Stylus RMX* software has a “chaos” feature that adds micro-variations in timing, dynamics, and pattern so that percussion loops resemble the varied performance flow of a human drummer. In its tweakability and sonic realism, software has irrevocably broadened the reach of electronic percussion to a point where it is difficult to discern between acoustically performed and electronically programmed drumming.

## **Perceptual changes brought about by electronic percussion: thinking about musical time and programming post-human beats**

By the late twentieth century, electronic percussion technologies had made their presence felt in two main ways. First, their uses led musicians to think about musical time. In the instruments of Roland, Korg, Linn, and other companies, musicians encountered technologies that did not resemble real drummers timing-wise, and so adapted themselves to new machine-oriented musical aesthetics. Through this encounter, the groove or rhythmic feel of human drummers came to be referred to as natural and micro-varied, while the groove of machine timing described as unnatural and rigid. Second, electronic percussion technologies offered musicians opportunities to create rhythmic textures that moved beyond simulating real drummers toward a robotic complexity that “suited the mechanized music they were making.”<sup>35</sup>

In the early 1980s, the timing of drum machines like the LinnDrum and the Roland TR-808 sparked a discourse about the aesthetics of rhythmic feel and its importance in making music with emotional power. Specifically, it was the rigid, quantized quality of drum machines that was considered lacking in expression and a constraint preventing musicians from adequately humanizing their music. Articles appeared in music trade magazines such as *Modern Drummer* and *Electronic Musician* about the dichotomy of the mechanical feel of the drum machine versus the organic feel of a human drummer. As *Modern Drummer* editor Rick Mattingly framed the issue in 1982, which feel – machine or human – is more musical?<sup>36</sup> The subject of these articles was how to negotiate quantization through techniques for programming realistic-sounding rhythms.<sup>37</sup> The subtext of these discussions was consistent: how rhythmic feel signifies the human element in music. By the late 1980s and 1990s, the discourse on how to humanize drum machines could also be found in articles in which authors discussed how to practice with and program them in order to mimic the sound of acoustic music ensembles.<sup>38</sup>

Along with inspiring discussions about musical time, electronic percussion made possible dense and complex rhythmic textures otherwise unplayable by a human drummer, freeing “the programmer to avoid the tried and tested conventions that the body unthinkingly repeats.”<sup>39</sup> As session musician Jimmy Bralower described his approach to programming during the LinnDrum era: “What would a drummer do if he had three hands?”<sup>40</sup> Moreover, with the rise of synth pop, hip hop, techno, and other electronic dance music styles in the 1980s and 1990s, musicians increasingly used electronic percussion in ways not imagined by its developers.

Roger Linn observed as much when he noted that even though he had designed the LinnDrum to sound realistic, he was surprised to find that musicians deliberately made it “sound as inhuman and rigid as possible.”<sup>41</sup> Similarly, the critic Simon Reynolds remarked that programmed percussion’s “multi-tiered” rhythms could be “body-baffling and discombobulating.”<sup>42</sup>

Linn and Reynolds’ terminology – “inhuman,” “rigid,” “body-baffling” – evokes how the rhythms made possible by electronic percussion technologies from the 1980s onwards had begun to reframe what drumming could be and what it could sound like. To take one often-cited example, the 1983 synth pop song “Blue Monday” by New Order is built upon a bass drum pattern refrain consisting of a rapid sequence of sixteenth notes programmed on an Oberheim DMX drum machine. Described by vocalist Bernard Sumner as “an experiment in technology,” the song illustrates the capabilities of drum machines to produce patterns idiomatically unlike anything a real drummer might play.<sup>43</sup> By the 1990s, electronic musicians were using samplers and software to design percussion parts far more intricate than the “Blue Monday” bass drum refrain. For example, producers of drum and bass music manipulated funk drumming “breakbeat” samples such as the “Amen” break from the Winston’s 1969 song, “Amen, Brother.” On tracks such as Roni Size’s “Matter Of Fact” (1997), breakbeats are sped up and rearranged into stuttering, “hyper-syncopated” permutations.<sup>44</sup> As Rick Moody explains this move toward ever more abstract percussion programming, “it’s the drums that really changed with digital editing.”<sup>45</sup>

### **Legacies of electronic percussion: contemporary practices**

In his book *More Brilliant Than the Sun*, a study of the aesthetics of sample-based electronic music, Kodwo Eshun notes that not only did drum machines and other forms of electronic percussion never sound like real drums; they also changed how we think about rhythm:

There are no drums in [drum machines]. . . You’d listen and they’d sound *utterly* different from drums. The movement from funk to drum machines is an extremely incredible one: people’s whole rhythmic perception changed overnight.<sup>46</sup>

In describing the “movement from funk to drum machines,” Eshun describes a shift from rhythm as a body dexterity of the percussionist to rhythm as produced by the technology of an electronic device or computer software. Moreover, rhythm’s electrification and virtualization brought about a change in the relationship between the musician and rhythm

patterns. Acoustic drumming joins gesture and rhythm whereby a “techno-physical, or bio-mechanical, relationship develops between the kit and the drummer’s body, between the instrument and the playing techniques.”<sup>47</sup> But virtual drumming – for example, pressing buttons on a drum machine, or programming software to sequence a pattern – involves a set of actions that for the most part decouples gesture and rhythm. It is in this regard that the story of electronic percussion is fundamentally about the reconfiguration of the interaction between musician and musical instrument by disconnecting rhythm patterns and sounding from the movements of drumming. Eshun suggests the notion of a “posthuman rhythmatcs” to describe this automatization of rhythm and how drumming no longer requires a musician’s motor patterns to produce it.<sup>48</sup> Unbound by the drumming body, beats today are as often *made* rather than *played* in any traditional sense.

This disconnect leads to two main legacies of electronic percussion. First, its uses have directed attention to the significance and subtleties of microrhythm in contemporary groove-based popular musics.<sup>49</sup> While the grooves of Sly Stone, Kraftwerk, Michel Jarre, and Afrika Bambaataa grew out of the limitations of early drum machines, the sound of twenty-first century popular music has largely embraced this mechanized aesthetic. As Jeremy Gilbert and Ewan Pearson note, what “were formerly prescriptions or restrictions have become active choices: while technology has enabled musicians to “loosen up” the beat, many chose not to.”<sup>50</sup> Yet some musicians do loosen up the beat, resisting the perfect timing so easily produced by drum machines and software. For example, the experimental electronic musician Flying Lotus programs grooves using samples that are loose with micro-timing discrepancies; similarly, the late hip hop producer J. Dilla was admired for finger drumming his beats on an MPC without using quantization.<sup>51</sup> Moreover, musical instrument manufacturers have incorporated rhythmic subtleties into their technologies to counter the default of quantized perfection: Ableton Live software includes a series of groove templates that emulate the quirky timing of classic drum machines, and its Push hardware controller takes a cue from Roger Linn’s shuffle algorithm by including a knob for adding swing feel by percentage. In these ways, electronic percussion technologies can produce rhythms that range from robotic to humanly swinging, or anywhere in between. A second legacy of electronic percussion is in hardware and software design. Resembling the design of Linn’s original MPC, grids of small rubber drum pads are now a standard feature on most percussion hardware controllers so that musicians can finger drum on them.<sup>52</sup> Finally, there is now a plethora of electronic percussion music apps that range from simulations of acoustic instruments and drum machines to more experimental interfaces.

Electronic percussion has traveled far from early rhythm machines like the Rhythmicon, Rhythmate, and the Side Man. Since the 1970s, the technologies have substantially shaped the sounds and grooves of numerous electronic musical styles by inspiring musicians to innovate techniques while negotiating the constraints of the mechanized aesthetic and the challenge of how to program beats that sound like they were played by a real drummer. At the same time, electronic percussion introduced ways of making unusual rhythms, thereby extending the capabilities of musicians, and prompted theorizing about the nature of rhythmic feel and how it signifies the human element in music. In sum, the ongoing history of electronic percussion is a story about building upon traditional understandings of the conventions and limitations of the musical body in order to innovate new practices of virtual drumming and creating rhythm using machines.

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PART THREE

## **Percussion in performance**



## 7 Lost and found

### Percussion chamber music and the modern age

ADAM SLIWINSKI

Percussion music is a contemporary transition from keyboard-influenced music to the all-sound music of the future. Any sound is acceptable to the composer of percussion music; he explores the academically forbidden “non-musical” field of sound insofar as is manually possible.<sup>1</sup> JOHN CAGE, 1937

A third concept . . . is to eliminate sounds of determined pitch from music. Or, in other words, to write pieces for percussion instruments alone. This idea seems to have been propagated mostly in this country, the U.S.A.; in fact, I have seen whole programmes made up only of percussion music. However interesting the use of rhythmic and other devices, I think it is nevertheless a rather monotonous experience for the listener to sit through a programme made up exclusively of percussion music. This is my feeling despite my high personal interest in the exploitation of percussion instruments in various new ways.<sup>2</sup> BÉLA BARTÓK, 1943

### Noise

These conflicting statements by two major composers of the twentieth century highlight one of the great rifts in contemporary discussions about music: what do we do about noise? “Noise” in this case refers not only to sounds that are loud or irritating, but more broadly to any that do not correspond with a tone on the piano keyboard (A, Bb, etc.). The history of how we arrived at tuning those keyboard tones is fascinating: they are compromised tunings, designed to create a symmetrical and flexible instrument that can modulate to different keys. Since Johann Sebastian Bach’s time, our musical discourse has revolved almost entirely around how to use them.

The role of the percussionist in Western music has long been to provide punctuation, color, and rhythmic drive. Within certain bounds of taste, composers employed noise to enhance their ambitious works. But it was taken for granted that for any piece of music to have real legitimacy and substance, it must consist of melodies and harmonies derived from the keyboard tones.

When, in the early twentieth century, Arnold Schoenberg took the seemingly radical step of systematizing the way the twelve tones were used in modern composition and breaking away from the traditional harmonic framework, he left this assumption of tone-based thinking completely intact. It was John Cage, a student of his in California, who took the most assertive step toward an all-encompassing world of “organized sound,”<sup>3</sup> an approach to composition that embraced the world’s chaos and stillness all together.

As happens with most artistic breakthroughs, this idea was already in the air. The Italian Futurists glorified the grinding cacophony of the industrial age decades earlier, and Edgard Varèse imagined music as massive sound objects colliding with each other, attracting and repulsing like celestial bodies.<sup>4</sup> In 1931, Varèse premiered *Ionisation*, an elegantly assembled but raucous collection of sirens, drums, rattles, and bells, and the most important early work for percussion ensemble. *Ionisation* articulated a new insight that Bartók casually dismissed: percussion was not only an extension of colors and exotic flavors that comprised a new niche group of instruments. It represented, as Cage famously claimed, an artistic revolution.

Along with my colleagues in Sō Percussion, a quartet that I have performed in since 2002, I teach a course at Princeton University to PhD composition students on writing for percussion. We always begin the semester by examining Cage's *Third Construction* from 1941, a work written for a fantastic variety of percussion sounds that, in my opinion, is his greatest feat of craftsmanship. We do this because some composers have not yet tried their hand at building a piece of music without using tones as the primary organizing element. Cage's work is so dazzlingly brilliant that it is hard to deny that he has created something more than a novelty out of purely rhythmic and coloristic elements.

Cage achieves this in an ingenious way: instead of taking a tiny kernel motive and expanding its possibilities outward (Beethoven's duh-duh-duh-duuuuuuh from his *Fifth Symphony* is an iconic example), he starts composing by deciding upon an outer shell: twenty-four sections of music consisting of twenty-four measures each (which creates a kind of square-root or fractal pattern). By determining this sturdy structure, he can add noise into the composition without each sound needing to justify its own existence as a cause or effect of other sounds; it can be just sound, and the piece will still hold together.

For instance, a shaker can be composed inside the shell structure to provide a nervous layer of noise for eight measures, pulsating on each bar, without justifying what the purpose of its existence might be for the goal of the piece. The shaker sound takes up time and space, making noise, and that is its justification for being in the scheme. But we can be assured that it will not go on shaking forever, because the larger section will have sixteen more measures no matter what. I don't want to leave the impression that *Third Construction* is static and does not build or climax – it does in the most spectacular way. However, it owes its existence more to a carefully planned subdivision of sections and rhythmic ideas than would any tonal piece (which relies on harmonic resolution for structure, not time).

Cage is most famous for his provocative 1952 “silent piece,” most commonly referred to by the duration of the premiere performance: four minutes and thirty-three seconds. His great insight in composing 4'33" was that the one indispensable element of music was not melody, harmony, or even necessarily rhythm, but duration. Sound must exist during a span of time, and that is all. The duration of the piece is also its structure, much like the 24×24 measure structure of *Third Construction*.

In 4'33", the performer indicates the beginning of the piece, and then does not make any intentional sound, incorporating only a few more visual gestures (like the opening of a piano lid) to indicate sectional divisions of the work. Of course, no performance space is completely silent, and so diverse combinations of sound permeate the space of the work (audience coughing or snickering, air conditioner vents, outdoor sounds).

*Third Construction* was composed eleven years earlier, so it is not quite as radical (Cage's output seems only to get more daring and abstract over the years). Its noises are more controlled and intentional. Of course, there is still a lot of variation between different interpretations of what rattle or shaker should be used, but at least the noises are composed on paper in measures and beats, which makes them easier to compare to other music from the notated past.

## **Echo chamber**

Example 7.1 shows a page from *Third Construction*. Cage's great aesthetic revolution aside, it looks very much like a page out of a classical string quartet. In fact, the means by which these lines dart in and out of each other's orbits resemble the interplay of a Haydn quartet. When our Princeton composition students hear us perform *Third Construction*, they see that resemblance immediately: we are in constant communication, cueing each other's entrances and listening with as much concentration as would any string quartet. Note that in this score, although there are no keyboard-matching tones, the notation does indicate higher and lower sounds so that it still looks like a traditional score.

As a percussion quartet, we owe an enormous debt to the string quartet tradition. Its transformation from the trio sonatas of Corelli and Telemann into the extraordinarily complex interactions of the string quartets of Mozart, Beethoven, and Bartók mirrors our own push from the back of the orchestra section to the front of the stage. Cage provides the fresh perspective that allows all-percussion music to begin, but earlier composers provide ballast, depth, and an ideal that inspires us to move forward.

**Example 7.1** *Third Construction*, second half of letter S, mm. 469–480. Dense counterpoint and interplay.

40

The image displays a musical score for a string quartet, consisting of four systems of staves. Each system contains four staves, representing the four instruments of the quartet. The notation is dense and complex, featuring intricate counterpoint and interplay between the parts. The score includes various musical notations such as notes, rests, and dynamic markings. Fingerings are indicated by numbers 5 and 7. There are also some slurs and accents. The score is divided into three systems by double bar lines with repeat signs. The first system has four measures, the second system has four measures, and the third system has four measures. The overall texture is highly contrapuntal and rhythmic.

One salient aspect of the string quartet to our evolution is that it was an engine of innovation in its own time, although it is often cast today as a staid, conservative genre. This has always baffled me, because much of the music written for string quartet – think of Bartók’s cascading *glissandi* in his *String Quartet No. 4*, or Beethoven’s *Byzantine Grosse Fuge* – is quite eccentric. The Western tradition of chamber music is so well absorbed and ingrained into our culture that we have become inured to its volatility. That is a shame, because it encourages us to see the old and new as so unlike each other, when in fact there is much to celebrate in common.

What is “chamber music”? What perhaps comes to mind first is the obvious connection: music fit for a chamber or salon. This suggests smaller forces, and compositions that function more like intimate conversations than universal statements or emblems of public religious observance. In fact, an important early usage of the term is in the *sonata da camera* (chamber sonata) of seventeenth-century Italy. The significance of the word *camera* was to clarify that the music was not meant for church (*sonata da chiesa*), which dictated some aspects of the style of the music. In general, “chamber” music tended to consist of multiple dance-derived movements (presumably for a small and select audience), while “church” music matched the solemnity of religious observance with abstract contrapuntal pieces (think of Bach’s famous Toccata and Fugue in D minor as a descendent of the “church” style). Gradually these genre practices started to blur and overlap, but chamber music retained a tendency toward multi-movement dance forms, as well as a sense of intimacy.<sup>5</sup>

Of course, many different kinds of music were performed in the *camera*, but “chamber music” came to signify instrumental music. In the hands of composers like Corelli, and later Haydn and others, these evolved from pleasant little pieces into fully cohesive dialogues, conceived with internal musical logic and a more or less equal participation of all of the parts. Eventually the sonata style of composition provided an engine for generating longer works without text. Importantly, as musical forces expanded in the nineteenth century and the role of the modern conductor was invented to manage them, chamber music came more and more to be distinguished by the fact that the individual musicians could still navigate the music without his mediation. In current usage, this tends to distinguish “chamber” from “orchestra”-type ensembles.

Many aspects of contemporary percussion playing do not fit our image of the eighteenth-century aristocratic salon. But it is these deeper qualities found in the long history of chamber sonatas and string quartets that inspire us to identify pieces like *Third Construction* as chamber music. A lot of percussion ensembles in modern culture emphasize the power and virtuosity of uniformity among massive forces: observe a drum corps line, with ten razor-sharp snare drummers executing in perfect unison, or the physical power of Japan’s Kodo *taiko* drummers. This is an effective use of percussion, but chamber music seeks to preserve the autonomy and quirky individuality of parts that can also be found in Haydn or Beethoven. In Cage’s *Third Construction*, each player busily carves out a unique role in the texture of the music. As if to make this very point himself, Cage *never once* has the members of the ensemble all playing the same type of instrument at the same time.

## Otherworldly

John Cage's meticulous inventory of percussion instruments from 1940, shown in Figure 7.1, lists the various instruments and beaters he had been collecting for several years. The west coast of the United States at this time was a bustling multicultural hive, and Cage was fascinated by all of the different knick-knacks that could be found in its immigrant quarters. At one point, he even held an instrument-purchasing fundraiser to which the famous author John Steinbeck contributed generously!<sup>6</sup> A glance over this inventory reveals a collector's dream: instruments from China, Japan, Turkey, Native American tribes, Mexico, and a number of ordinary objects that are logged in as instruments (hand saw, forks, chopsticks). The list reveals a trend that would become manifest in Cage's own music as well as

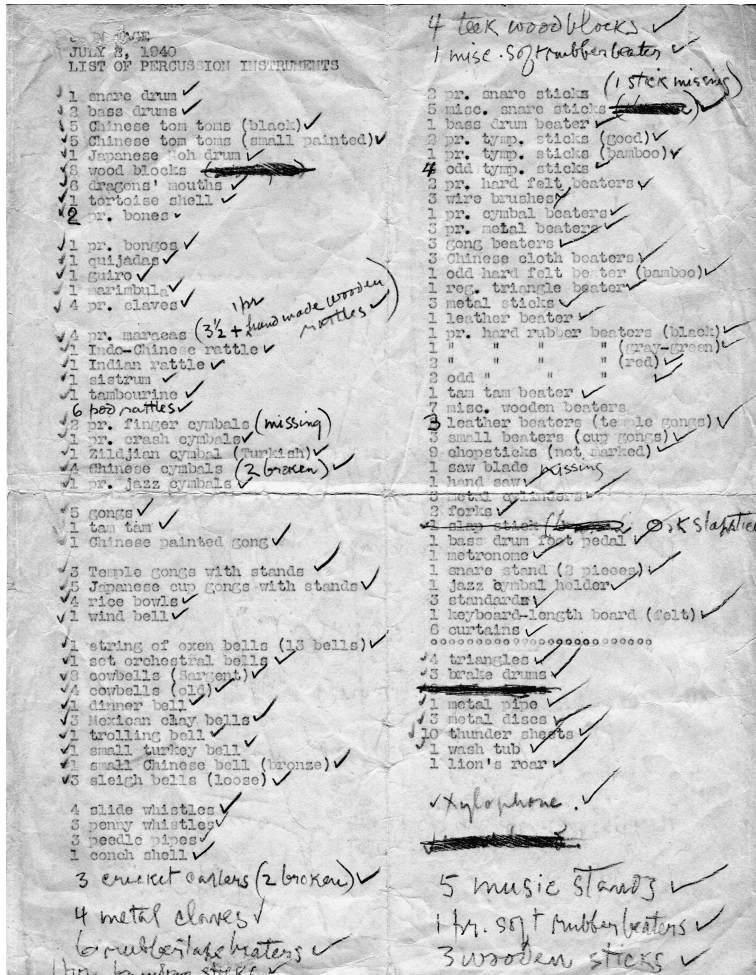


Figure 7.1 John Cage percussion inventory.

that of many other composers: the instruments were being collected, repurposed, and recombined for their sound qualities, not used in their original cultural context, if they even possessed one.

Despite the depth and richness of the history of orchestral percussion playing, European high culture has had a strangely antagonistic relationship with drums and percussion instruments. Nearly every other culture one can think of – Indian, Japanese, West African, South American, Native American, Indonesian – has a percussion orchestra at the center of its artistic life. It is true that the kettledrum player had an elevated status in medieval musical ceremony, heralding the arrival of royalty along with trumpets (though that instrument itself was adopted from the Middle East).<sup>7</sup> But the percussionist's position in the back of the symphony orchestra not only is a matter of acoustics, but also represents a way of keeping the potential violence and chaos of our sounds at arm's length.

Innovative composers like Berlioz, with his eight timpanists in the *Requiem*, or Beethoven, with his Turkish military references in the *Ninth Symphony*, found very impactful opportunities to deploy percussion. Even so, they understood fully that these moments were transgressive, exotic, or terrifying. It would never have occurred to them to generate entire pieces from only these effects (and let us not forget that timpani are tonal instruments anyway).

Western musicians became increasingly fascinated throughout the twentieth century with instruments and practices from around the world. The story of the ways in which these influences collided with Western culture is complicated, and sometimes very sad; it is important to acknowledge that this history is a difficult one. A dramatic example is found in the invention of the steel drums in Trinidad, where in the nineteenth century, British colonial authorities forbade the use of drums after carnival celebrations turned into antipolice riots. Stripped of the instruments that connected them with their African cultural roots, the Trinidadians began to invent new ones out of what was lying around: first bamboo, but eventually also car brake drums, biscuit tins, and discarded oil drums.<sup>8</sup> Over time, they fashioned these empty oil containers into gorgeous resonant metal drums. Today, that instrument is a treasure of Trinidad's culture, but it was born out of the unmistakable legacy of oppression.

In Cage's capable hands, instruments from other musical societies were appropriated in ways that deftly sidestepped the cultural complications that might arise. Since his new world of noise allowed for potentially any sound to exist on equal terms, instruments were happily adopted for their colors and characteristics. For instance, when he

wrote for tom-toms in the beginning of *Third Construction*, he indicated for them to be played delicately with fingers, avoiding a clichéd tom-tom beat that would mimic Native American drumming (although he did this knowingly in *Credo in US*, his eclectic pastiche of American *bourgeois* conventions).<sup>9</sup> No other outlet in Western classical music offers the richness of possibility for cross-cultural exploration that percussion does. As an openly defined medium, it provided Cage with the same encompassing container for diversity that his 24×24 structure allowed for the use of noise.

### Lost and found

Among Cage's inventory, as well as in the score to *Third Construction*, we see instruments that are not directly borrowed from any other culture: saw blades, tin cans, thunder sheets, a wash tub. At first glance, they do not appear to be instruments at all. Like the Trinidadians – though under vastly different social and political circumstances – Cage gathered ordinary objects that he thought might have musical value. When we consider the precious and elevated status of instruments in classical music at the time – Stradivarius, Guarneri, Steinway – we see that Cage and his contemporaries were opening up yet another challenge to convention by including so much junk in their compositions. It was junk reimaged, but still junk; I would be no more distraught to lose my washtub than any other piece of trash I have. We call these “found” sounds, and they usually fall into the domain of the percussionist. The musicians who collected and utilized these sounds owed a great debt to artists such as Marcel Duchamp, whose “ready-mades” turned the idea of the exalted art object completely upside down.

One of Cage's most notable found instruments in *Third Construction* is the tin can. He did not just casually write for a can here or there, but gave it a prominent place in the composition: there are five tin cans in each player's setup, playing mostly melodic lines. Example 7.2 shows an exciting tin can moment in the piece, the crashing climax before the blown conch shell propels the piece on to its accelerating finish (cans are in players two and four).

A tin can is not only a vivid and complex sound, but also an elegant solution to some of the philosophical and aesthetic questions that thoughtful composers faced in the twentieth century. First, it is noisy not only in the strict sense that it does not articulate one of the twelve tones, but also in the more familiar and associative sense: it makes a lot of noise! In 1987, David Lang, Julia Wolfe, and Michael Gordon started a new music

**Example 7.2** *Third Construction*, second half of letter “O,” mm. 373–384. Tin can climax.

32

The image displays three systems of musical notation for a percussion ensemble. Each system consists of four staves. The first system begins with a dynamic marking of *f* (forte) and includes a five-measure rest in the second staff. The second system starts with *ff* (fortissimo) and features a *dim.* (diminuendo) marking over the second staff, along with a five-measure rest in the first staff and a *cresc.* (crescendo) marking in the third staff. The third system begins with a *p* (piano) dynamic and a *cresc.* marking, and includes a five-measure rest in the second staff. A *TAMBOURINE* marking is present in the second staff of the first system. The notation includes various rhythmic patterns, rests, and dynamic markings such as *dim. molto* and *f*.

collective and festival in New York with the intention of conveying a sense of freshness, playful iconoclasm, and social inclusiveness around the world of avant-garde music. It is no accident that they chose to name their new organization “Bang on a Can,” for the image and gesture of Cage’s noisy tin cans perfectly conveys an anarchic yet loving break from the past. (Figure 7.2 shows John Cage with some of his instrument collection.)

Second, as I wrote in the previous section, the repurposing of instruments from other cultures does have its baggage. Unfortunately, European



**Figure 7.2** John Cage with lion's roar, tin cans, wash tub, flower pots, and Chinese tom-tom.

and North American history is rife with insulting references to the customs and practices of other cultures. This legacy can be overcome by well-meaning artists, but junk is the solution that comes out of our own industrialized culture: it is uncomplicated by reference to anything outside our own backyards. The tin can is both a miracle of modern engineering and a blight on Mother Nature. For better and for worse, it is our own sound. If we embrace it, we understand ourselves better.

For composers living in bustling New York City or San Francisco of a hundred years ago, it was very difficult to ignore the fact that these were noisy places. Musical temples with flawless acoustics such as Carnegie Hall were built to idealize nature in all its abstract forms, but the society around them was everywhere bending nature to its will (Andrew Carnegie more than most). At the heart of the collision between the Romantic and modern sensibilities lay the question of whether to resist or embrace what we were actually doing to the world. Cage's tin can is the most perfect musical utterance of Walt Whitman's "barbaric yawp," an iconic expression of aesthetic industrial modernity.

## Decisions, decisions . . .

Rather than specialist-performers, percussionists are more like curators of sound. We are utilized not just for our skills at playing particular instruments (though that's part of the job), but also for our *willingness* to cope with new instruments, ideas, techniques, and aesthetic purposes. My favorite example of this is the question of who should honk the car horns called for in George Gershwin's rambunctious orchestral work *An American in Paris*. Would an orchestra manager ever hand them to the horn section? Of course not! It would be the percussionists, as any police whistle would also be sent to the back and not to the piccolo section.

This is where our identity as chamber musicians runs into its greatest dissonance: some of the intimacy of chamber music is driven by the relationship that musicians have with their instruments, sometimes going on for many years. For a percussion quartet, quite literally every piece of music is likely to have different instrumentation. That issue of instrumentation – *what shall we play* – animates a large part of the act of making percussion music. Sounds can be endlessly combined and reimagined, using tools and resources that were completely outside of the experience of any of the great composers from the past. Each contemporary composer, rather than belonging to a single cohesive culture, is adrift in a sea of possibilities, both exhilarating and terrifying.

Let us return to Cage's *Third Construction* to see an interpretive situation that diverges mightily from what a string quartet would face. Example 7.3 shows part of the instrument key for the piece.

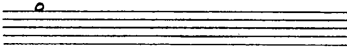
In many ways, it seems quite specific; there are a lot of instruments to gather based on just this partial list. But Cage leaves many questions of instrument selection unanswered. For instance, each player is instructed to play "3 graduated drums" and "5 graduated tin cans." Strictly speaking, this means that each player must have exactly that number of those instruments, and that the instruments should ascend or descend in perceived pitch (even if they don't fit into Bach's twelve tones, highness and lowness are distinctly audible). What the score does not say is how high or low these instruments might be set overall or exactly what characteristics the drums will have. With the string quartet, an infinite number of possibilities exist for interpretation, but that never includes the question of what instrument will be played. We would not compare two interpretations of Beethoven by noting how one ensemble chooses to play the top line on the cello, while another uses a violin (extremely similar instruments that play in different registers).


Another excellent example involves the claves (small cylinders of wood that form the backbone of much Afro-Caribbean and South American music). Example 7.4 shows an exquisitely intricate clave trio. Each pair of


**Example 7.3** *Third Construction*, instrument key, players one and two.

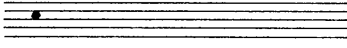
## ORCHESTRA

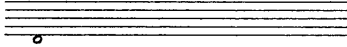
①

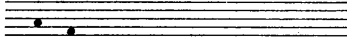
N. W. INDIAN RATTLE (WOODEN) 

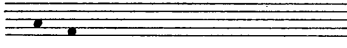
5 GRADUATED TIN CANS 

3 GRADUATED DRUMS (TOMTOMS) 


CLAVES 

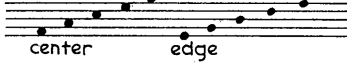
LARGE CHINESE CYMBAL (SUSPENDED) 

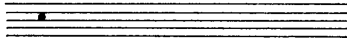
MARACAS 

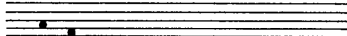
TEPONAXTLE 

②

3 GRADUATED DRUMS (TOMTOMS) 

5 GRADUATED TIN CANS 

CLAVES 

2 COWBELLS 

claves has a slightly different pitch, and depending on who plays which instruments, the melodic contour of this section could vary widely, as the interlocking, or hocketing, rhythms dance up and down. Leaving this kind of compositional decision to the chance element of the performers' instrument choices is not a common characteristic of most classical music. Notice that in Cage's score the claves (appearing in parts 1, 3, and 4) are notated on the same line, but are almost guaranteed not to be the same pitch.

**Example 7.4** *Third Construction*, second half of letter “G.” Clave trio.

18

The musical score consists of four staves. The first two staves are labeled "CLAVES" and the last two are labeled "CANS". The music is written in 4/4 time and features complex rhythmic patterns, including many quintuplets (marked "5") and triplets (marked "3"). Dynamics range from *ppp* to *f*. A "Ritard" marking is present at the beginning of the third system. The score is divided into three systems by double bar lines.

### Do it yourself

Professional percussionists in 1941 had never seen anything like *Third Construction*, and percussion chamber music was simply not a viable genre at that time. But this did not deter Cage, who simply gathered friends together and made do. His original ensemble consisted of the great dancer and choreographer Merce Cunningham (his longtime collaborator and later companion), his wife Xenia, and sometimes even the bookbinders that worked in the shop underneath Cage's apartment. Cage mentions that

there is a specific reason why they did not perform pieces with rolls, the continuous and rapid alternation of strokes used to produce a smooth legato: nobody in his ensemble could play them!<sup>10</sup> In the absence of a skilled force of musicians to tackle his fresh ideas, Cage forged ahead with his own “do it yourself” (DIY) solutions.

On December 9, 1938, Cage’s group presented the first full concert of percussion music in the United States at the Cornish School in Seattle.<sup>11</sup> This program consisted of works by William Russell, Ray Green, Gerald Strang, and Cage. In subsequent concerts, the group drew greater attention, attracting more players as well as compositions by Henry Cowell, Lou Harrison, Amadeo Roldán, and others. In May 1941, *Third Construction* premiered in San Francisco in a program of music by Cage and Lou Harrison. The original performers were Xenia Cage, Doris Dennison, Margaret Jansen, and Lou Harrison, with Cage conducting.<sup>12</sup>

One of my most cherished experiences was having dinner with Merce Cunningham and my Sō Percussion colleagues in the loft that he had shared with Cage in Manhattan. This was in the last few years of his life, and although he was confined to a wheelchair, his dance company was running strong and he was churning out new work every day. We pressed him to recount details of the days when their motley crew of artists, dancers, and musicians would travel around presenting their unusual work. It is all too easy to enshrine great talents like this in a glorious past – here was a man sitting with me who had danced Aaron Copland’s original *Appalachian Spring* with Martha Graham! But the stories he most wanted to tell were about the freewheeling and chaotic nature of going on the road with his friends, stories that bore a striking and touching resemblance to the life we ourselves were living in Sō Percussion. Cunningham talked of throwing instruments in the back of a VW bus, lashing a few of Robert Rauschenberg’s sets and paintings to the roof because there was no other space for them, and setting off down the highway, looking for places to present their work. The major difference between his trips and ours is that Cage insisted on getting off at the rest stop to forage for mushrooms and other plants, while we grudgingly but willingly will hit the Burger King when needed.

After Cage’s prolific period of 1935–1943, he wrote much less music for percussion group, and for decades *Third Construction* lay unplayed. Then, in 1968, percussionist Jan Williams, a creative associate in Lukas Foss’ new music group at the State University of New York in Buffalo, formed the New Percussion Quartet (NPQ) and, working with Cage directly, began performing his percussion music again. In 1975, *Third Construction* became available from C. F. Peters Publishing Co., and Williams’



**Figure 7.3** Nexus playing *Third Construction*. Clockwise from left: Garry Kvistad, Bill Cahn, Russell Hartenberger, Bob Becker.

percussion quartet performed it in Buffalo and later in New York City. Garry Kvistad and Allen Otte, founding members of the Blackearth Percussion Group, heard one of these performances and began to include it on Blackearth's concerts. Members of the Canadian percussion group, Nexus, which had formed in 1971, heard a recording of a Blackearth performance of *Third Construction* and also began playing it regularly on their concerts (Figure 7.3). A performance by Nexus at the Percussive Arts Society International Convention in Knoxville, TN, in 1977 brought international attention to the piece. Other professional percussion groups, including Synergy Percussion (created in Sydney, Australia, in 1975), Kroumata (founded in Stockholm, Sweden, in 1978), and Amadinda (formed in Budapest, Hungary, in 1984), soon followed with performances of *Third Construction*, and it is now a centerpiece of the percussion ensemble repertoire.<sup>13</sup>

In addition, *Third Construction* and other works by John Cage are regularly included in university percussion ensemble programs. Paul Price established the first accredited percussion ensemble at the University of Illinois in the early 1950s. When he moved to New York to teach at the Manhattan School of Music in 1957, he again created a percussion ensemble as part of the curriculum. Percussion ensembles are now established programs in universities throughout the world. The Oberlin Percussion Group, formed in 1972 by Michael Rosen at the Oberlin Conservatory, and in which I performed as a student, is an

example of an ongoing university ensemble that regularly includes music by Cage and other composers of percussion music in its repertoire.

Often the spark that lights the future is to be found in obscure places. Although Cage's percussion compositions garnered plenty of attention in their days, it seems that Bartók's view was the prevailing one: however novel or worthwhile these explorations were, they were not thought to amount to much in the long run. As time passed though, Cage's vision of a noise-and-rhythm-enriched future came to be, and that's the world we are happy to live in now.

## Present and future

*We are all going in different directions.*<sup>14</sup> JOHN CAGE

Something very strange and wonderful happened near the end of the twentieth century: the idea of percussion-only chamber music, which Bartók was wary of and which Cage championed full throttle, seemed to take hold in a new way. This was no accident. In North America, the music of Steve Reich, particularly *Drumming* and *Music for 18 Musicians*, using percussion as the dominant voice in chamber ensembles that included strings, winds, and voices, reinvigorated percussion chamber music and inspired new groups to form. In Europe, composers like Iannis Xenakis and Karlheinz Stockhausen saved their most fascinating and radical experiments for the percussion ensemble. Xenakis' *Pleiades* (written for Les Percussions de Strasbourg, one of the first European ensembles) in particular calls for an entirely new type of metal instrument to be built just for the piece! The stature that these composers enjoyed in the broader music world drew more and more attention to percussion chamber music.

Sō Percussion was one of these groups and the beginning of our ensemble exemplifies the way percussion has continued in the development of new repertoire and approaches to performance. Founded as students in 1999 at the Yale School of Music, we came together to study with Robert van Sice, who from his own experiences in Europe and North America believed that the time was right for this music to have a wider audience. When Sō Percussion first started out, the operation felt just as "DIY" as it had for John Cage and his friends. We rented a space in nearby Hamden, CT, rehearsing most days from 7 to 9 in the morning so that everybody could go off to other jobs and schooling during the day. There was no heat, and many of those frigid Connecticut mornings were spent hashing out David Lang's new piece *the so-called laws of nature* with bulky winter gloves on.

We played a few concerts around campus, including an all-Steve Reich program that the composer attended, and started booking shows at art galleries and other alternative spaces. Audiences responded enthusiastically to our performances, but it seemed to me that there were other forces at work. Some kind of cultural maturity had accumulated in which the work of these great pioneers and the ensembles that championed them stoked the imaginations of several generations of listeners. The listeners tended to be a smallish group of die-hard fans of experimental art and music, but they existed nonetheless.

There was a combination of awareness and hunger for new ideas. Reich's *Drumming*, lasting more than an hour, was a cultural phenomenon in the 1970s, appealing enormously to the baby boomer generation who loved its meditative plateaus. Many who were fascinated by *Drumming* also embraced our work. But to honor the spirit of composers like Reich was not only to consolidate their music into a new classical canon, but also to forge ahead with our own new experiments. As stunning as *Third Construction* is, it is still only ten minutes of music – hardly enough to anchor even half of a concert program. When we attended concerts of the Tokyo String Quartet at Yale, we noticed that a large work by a master such as Beethoven or Shostakovich always anchored the second half of the program – thirty minutes of music at least.

Sō Percussion set out to commission as much bold new music as possible from the composers of our time, hoping especially to generate works that dared to contend with the old masters in scope and ambition. The veteran groups that we emulated like Nexus, the Amadinda Percussion Group, and Kroumata provided prolific models for this kind of activity. The first major piece that came out of the process was the previously mentioned work by David Lang entitled *the so-called laws of nature*. Lang's piece, a three movement, thirty-six minute journey, was a direct response to the grand statement of Reich's *Drumming*. It consists of extremely vivid and novel textures, notably flower pots (very delicate, tuned to specific pitches), teacups, tuned metal pipes, and car brake drums. The length of the work meant that it could stand alone on the second half of a concert as a unified statement. This was helpful not only artistically, but also because moving all those instruments around on stage was a huge pain in the neck!

One aspect of Lang's piece that differs from Cage's is that he uses tones, happily and freely, as primary resources in composing the piece. This is actually one of the greatest aspects of Cage's legacy as I see it: although he and other composers like Varèse had to tear a hole in the fabric of tone-thinking that ruled their age, we now have their example to emulate, and we need not stick exclusively to either only noise or tone-based sounds. In

the so-called laws of nature, tones introduce themselves in a way that derives from the thinking of minimalists like Reich. Instead of proceeding toward final goals as with traditional tonality (the final C Major chord in a C Major symphony), they resemble abstract mathematical patterns and cycles which collide with each other in unpredictable ways. Most of the tone-bearing instruments in Lang's piece fall into the "found" category that I mentioned above: hand-cut metal pipes and flower pots.

Many ambitious percussion groups find themselves in a position where they simply need more music to play – as I mentioned, even a great masterpiece like *Third Construction* lay dormant for many decades. It feels risky to generate a whole new repertoire, as we compete for audiences with classical groups who have winnowed the most exceptional pieces out of hundreds of years of practice. As a result, many classical listeners' expectations are conditioned by the fact that they are used to hearing fifteen of the most astonishing composers from the last 500 years over and over again. Percussionists are constantly orienting audiences to new ideas, infusing a sense of fun and exploration as we push forward in Cage's "different directions."

Since David Lang's piece, *Sō Percussion*, like many other percussion groups around the world, has continued commissioning composers and has also branched out in many other ways: composing, improvising, and collaborating with different kinds of other artists. My hope is that we've reached a tipping point, where diverse and innovative music like Cage's will no longer lie fallow while we wait for curious musicians to pick it up. The trend I see right now is toward percussion groups finding a new voice and niche for themselves, not rushing to artistically imitate other successful groups. We have common repertoire, but most ensembles work to find their own place among the explosion of new activity. My greatest wish for this field appears to be coming true, which is that we would rip the seams off of our limited perception of what truly new music might sound like. Following Cage's model, the goal of percussion chamber groups has not been to replace the old with the new, but to expand the vistas of possibility beyond what the old offered. Luckily for a percussionist, that doesn't have to mean taking Beethoven's bust off the mantle and shattering it. We only need to slip out the door and see what new sounds might be waiting for us in the world.

## Notes

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3. J. Cage, *Silence*, p. 5.
4. E. Varèse, "New Instruments and New Music," in C. Cox and D. Warner (eds.), *Audio Culture: Readings in Modern Music* (New York: The Continuum International Publishing Group, 2004), pp. 17–8.

5. R. Taruskin, "The Italian Concerto Style and the Rise of Tonality-driven Form," in *The Oxford History of Western Music* (Oxford University Press) Kindle eBook.
6. P. Cox, "Percussion: The Future of Music: Credo," liner notes, "John Cage Bootlegs," *Sō Percussion* (2012), p. 7.
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11. B. M. Williams, "Percussion Music," p. 11.
12. *Ibid.*, p. 128.
13. R. Hartenberger, email correspondence (January 31, 2015).
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## 8 Taking center stage

### Percussionist as soloist

COLIN CURRIE

When approached about writing a chapter on the subject of solo percussion, I was delighted to accept and wondered how I should begin proceedings. Perhaps, with some forthright claims for the art form itself – that percussionists continually innovate and gather repertoire at such a commendable rate, that the visibility of the art form continues to claim new ground and command accolades. More people play solo percussion than ever before, at a higher level, and to a wider audience. Opportunities abound and acceptance of the art is worldwide – or words to that effect. However, looking back at just the intervening months alone since the proposal would make even such lofty claims appear too modest and guarded. The exhilarating fact is that the art of solo percussion is already a story of triumph, and one that prevails on a sturdy momentum. Furthermore, as an example of instrumental emancipation, it is one that has a fascinating short history and a brilliant future. Above all, I will present the flourishing breadth of repertoire, which for me has been the key to our castle of credibility. I will share my own personal adventures too, the challenges, thrills, and demands of being a percussion soloist, and where I believe all this could be heading.

#### Early percussion works

What has been achieved has certainly been done so on the shoulders of giants. I continue to cite four works that remain relevant to anyone wishing to understand contextually how these instruments came to gain the dignity and flexibility associated with art music of relevance and integrity. Those works, beacons shining from various points of the twentieth century, would be Edgard Varèse's *Ionisation*, Béla Bartók's *Sonata for Two Pianos and Percussion*, Karlheinz Stockhausen's *Kontakte*, and perhaps, let's say, your Xenakis-work-of-choice (in my case, *Komboi* for percussion and harpsichord). In each instance, we hear remarkable developments from composers of great genius who were able to ignite our sound world within edifying works of enduring influence. Although none of these maestri wrote concerti for percussion, they, alongside Stravinsky, Britten,

Messiaen, Berio, and Ligeti, would push percussion writing to a place ripe for the role of the soloist. The percussion virtuoso crystallized via these writers as players found themselves having to handle increasingly challenging passages in increasingly central roles, certainly now quite equal to demands made of their fellow instrumentalists. Such would be their influence that by the end of these composers' lifetimes, it would be too difficult to make an exhaustive list of percussion-composer-innovators; no matter how you compiled it, and I did try, it would invite omission.

The first works for solo percussion in the absolute sense are most likely creditable to John Cage, Morton Feldman, and indeed, once again, Karlheinz Stockhausen. Many pieces of chamber music would provide considerable innovation too, notably those of Steve Reich who would place the percussion family firmly at the center of his entire oeuvre, currently spanning six decades. The first recognized percussion concerto dates way back to 1929–1930, Darius Milhaud's hauntingly noir *Concerto pour Batterie et Petit Orchestre*. This would be followed by the same writer's amazingly dexterous marimba and vibraphone concerto from the 1940s and Paul Creston's sprightly marimba concertino, also from the 1940s. By the 1980s, a number of key performer-innovators became visible, and in tandem with their own contemporary composers, the cult of the percussion concerto gained firm ground. These works, being presented by symphony orchestras, would go on to give solo percussion arguably its widest, or certainly biggest, audience. From the 1990s, I would say that three works in particular consolidated the movement, thanks to their incontestable success with audiences and the hundreds of



Figure 8.1 Colin Currie.

performances they would continue to enjoy. These works are James MacMillan's *Veni, Veni, Emmanuel*, Joseph Schwantner's *Percussion Concerto*, and Christopher Rouse's *Der Gerettete Alberich*.

## Personal background

My own encounters with the very concept of solo percussion began early in my life and, being as I am born in 1976, these might serve also as a laudable timeline for the accelerated rate of change in the art. My own studies began aged five at the piano and aged six at "the drums," and my earliest ambition was to become some kind of multi-instrumentalist. I was incredibly fortunate to hear Buddy Rich live on his final European tour in Edinburgh in October 1984, and this is worth mentioning because whatever one's feelings about his performance style, he was in his own way a landmark percussion virtuoso. A child or even baby prodigy, "Traps the Drum Wonder" was already performing professionally aged only eighteen months in the year 1919, making him a pioneer nonpareil. He would go on to command musical shock and awe via his epically driven big band, prowess matched only, and famously, in a drum battle with Animal from the Muppet Show. As an eight-year-old scatter-gun drummer/percussionist, my encounter with this "Super Drummer" (the words in Superman 3-D font proudly emblazoned across the central spread of the program booklet) was monumentally catalytic.

In 1989, another local encounter would have a huge impact on my own developing tastes for new music and the avant-garde, indicating to me for the first time also the direction and possibility of a classical percussion soloist. This was Danish percussionist Gert Mortensen's solo recital at the Edinburgh Festival, a brilliant and disturbing event that was packed with landmark music for the solo percussionist. Here, I heard for the first time Per Norgaard's *I Ching*, Iannis Xenakis' *Psappha*, and Askeell Masson's *Prim*. Together these pieces represented a serious, considered, and moving sweep of music that fundamentally transformed my notion of what the instruments could collectively achieve – in the hands of the right kind of performer. In a lateral move from this concert, I also discovered a record by Japanese maverick, Stomu Yamashta, whose body of works by Hans Werner Henze, Peter Maxwell Davies, and Toru Takemitsu, all in fantastically eccentric form, would make for yet another glittering and baffling encounter. This album, dating amazingly enough from 1971, is another backbone of percussion's modernity and maturity.

Scottish composer John McLeod gave me some of my first musical training, introducing me to recordings of orchestras and giving me my first music theory lessons. He would go on to collaborate very significantly with

Scottish soloist, Evelyn Glennie, writing two of her key early works, both of which I attended in performance subsequent to their premieres. These are his arresting *Percussion Concerto* (1987) and *The Song of Dionysius* for percussion and piano which was given a fabulous first outing at Glennie's landmark solo percussion recital at the BBC Proms (London) in 1989. Glennie's formidable energy as a performer and her strive to overcome severe deafness over an astounding career would mark her out as heroine to a huge public, and her inspiration transcends the purview of this chapter.

Meanwhile, stateside, a generation of virtuosi, and indeed entrepreneurs in the field of solo marimba, were taking hold and changing not only the quality of performance, but the techniques and equipment used. Vida Chenoweth (a delightful polymath whom I met in Oklahoma City in 2013) and Clair Omar Musser were early key figures. Robert van Sice was the first marimba specialist I became aware of, and his recording of concerti by Alan Hovhaness, Peter Klatzow, and Frank Nuyts remains an important document of the progression of the instrument. The marimba world would indeed bloom magnificently and become peppered with an amazing variety of fantastically committed personalities with incredible diversity of approach to the instrument. Whether through the velvety rich-toned allure of Nancy Zeltsman or the more clattering wooden cascades of marimba doyenne Keiko Abe – presently still performing at the redoubtable age of 77 – there will forever be an approach to float your rosewood boat. Several companies would emerge specializing in the manufacture of marimbas, often with highly experienced players to publicly endorse their products via clinics, courses, residences, and recitals, to share the latest developments. In addition to the burgeoning marimba community, the United States also boasted its own commanding and erudite percussion soloist in the form of Steven Schick, whose manifold achievements extend well beyond commissioning and solo performing, into chamber music, conducting, research, teaching, recording, and writing magnificently on the art for which he is such a beautiful spokesperson.

## **Percussion chamber ensembles**

Scarcely ancillary to the raising of the overall level of percussion playing have been the chamber ensembles and percussion groups that grew up in the 1970s, many of which continue to thrive and inspire to this day. I believe that the strong foundations laid by ensembles such as France's Les Percussions de Strasbourg, Canada's Nexus, Australia's Synergy, Hungary's Amadinda, and Sweden's Kroumata did a huge amount to

raise awareness and diversify the repertoire. Of particular personal import was the miraculous Safri Duo from Denmark. I encountered Morten Friis and Uffe Savery during their first foreign tours in the early 1990s and was captivated by their exuberant, feisty virtuosity and extravagant showmanship. Their collective sound really filled a room while their approach to the mallet instruments in particular, and the zest with which they engaged with them, was a revelation. This was a powerful unit, deeply expressive, with a gorgeously seamless sense of ensemble that was a sea change for percussion. They were also extremely encouraging and inclusive, informal, friendly types that naturally extended to the surrounding and succeeding generation. I recall a highly convivial post-concert dinner in London's Chinatown with them in 1999, for example, full of the japes and jokes that were part of their refreshingly generous spirit.

### **Percussion concerti**

This backdrop of both great talent and innovation is the broad story of percussion playing in the last few decades. It is the community I grew up in and the one that continues to energize me. I will now retell some of my first forays as a soloist, as I am continually asked how it came to be that I could establish myself as such. My own experience began aged fifteen with a performance of Andrzej Panufnik's *Concertino* for timpani, percussion, and strings, courtesy of the London Symphony Orchestra's Shell-sponsored music scholarship, and performances of Ney Rosauro's *Concerto for Marimba and Orchestra* in the same year (1992). I then began an investigation of recital pieces, still particularly limited at the time, and would premiere my first concerto, by Errollyn Wallen, in 1994 at London's Barbican Centre. This work, commissioned by the BBC, was to mark the occasion of the BBC Young Musician of the Year accepting percussion candidates into their fold, alongside the more familiar categories of strings, wind, brass, and keyboard. The move was not without controversy, nor without success, but suffice to say that it was a major step for the visibility of the art form. The competition retains percussion candidacy and Adrian Spillett would win the competition outright in 1998. I then began largely orchestral studies at London's Royal Academy of Music, making time on my own clock for the emerging opportunities coming my way to perform as a soloist. These would often be in recital in and around London, at music clubs and in schools concerts. I would highly advocate a similar approach for anyone starting out – any gig is a great gig, and one's reservoir of experience is not venue-fussy, nor should it ever be.

In 1996, the Royal Scottish National Orchestra gave me an outstanding opportunity – to perform the still very fresh *Veni, Veni, Emmanuel* by James MacMillan. This should be recorded as it shows one of the moments when a work would command sufficient respect and notoriety to pass into the repertoire of a range of soloists. Since then, it has been my primary aspiration to establish as full a body of work as conceivable for soloists joining the scene and for percussive posterity in general. The MacMillan was an incredibly challenging learn for me aged nineteen, and I also pushed myself to perform it from memory in these first performances, adding further challenges to practical concerns regarding setup and integration with the ensemble. When I came to the initial rehearsal, it was for the very first time that I would be able to amass all the instruments needed for the work, and simply arranging the instruments at the right angle to be sure I could see the conductor and have proper connection to the wind, brass, and timpani were among the first teething lessons of this endeavor. Since then, I have always worked with the conductor placed considerably downstage to assure a solid visual connection and placed instruments/setups at a slight angle to allow connectivity with colleagues in the orchestra. Blend, balance, and awareness remain the fundamental ingredients of performing percussion solos with orchestra. Inevitably, *Veni, Veni, Emmanuel* remains a kernel of the concerto repertoire. Not only with its vast number of performances accrued to date (counted by the hundred-load) but for its ability to bring music of both dissonance and rhythmic complexity to mass appeal. My experience with the work, nigh on two decades worth now, is one in which the emotional content of the music cannot help but flow in every single performance. Largely, and impressively, it is also a concerto that concentrates on the un-pitched instruments, managing to integrate these sounds thematically and melodically into the musical argument. As such, it addresses a key question still raised by composer and lay-listener alike: how to write soloistically for the instruments of un-fixed pitch. Solutions here include giving them characterful, sustained lines to play and support them skillfully in the orchestration, varying this element to refract the different qualities of the instruments in question. These concerns surrounding the un-pitched instruments encountered another and vivid solution in one of my first major premieres, the large and ambitious *Rapture* by Michael Torke, in which every single un-pitched element would be doubled up, as a matter of the strictest principle, by a section of the orchestra. In the best performances of this work, a balance would be achieved in this scenario, turning my drum setup into a giant symphonic trigger system or perhaps some kind of vice versa arrangement. Whatever the solution, my strongest impressions to date are from the concertos that make these instruments take on some kind of new life in context, taking flight within the colors of the ensemble.

The strongest advice to anyone starting out as a soloist is to build your own repertoire. This is the likeliest route to achieving the notoriety needed to be on the radar of an ever-increasing circle, and the path with the famously twinned properties of both highest risk and rate of return. A stroke of luck for me was my proximity to two peers in particular with whom I developed in tandem and amassed a large number of pieces tailor-made for my sensibilities. I met Joe Duddell and Dave Maric in the melting pot of the Steve Martland Band which I joined in 1995, and the idea of forging a collaboration over a number of works with them quickly took hold of me. Of great personal import and vital to the repertoire as a whole are Duddell's two sublime concerti, the supple, keening *Snowblind*, for tuned percussion and strings, and *Ruby*, for solo percussion and symphony orchestra. *Ruby*, especially, was a huge turning point – a haunting work that harnessed a deep poignancy from the instruments, a concerto that was as introspective as it was outgoing. The mellifluous spell of the piece cloaks certain strands of pop music in a curious bi-tonality, reaching a timeless conclusion in the slow movement that kept thousands of people at the Albert Hall premiere frozen to the spot. For me, such moments would begin to point toward a growing maturity in the repertoire – more angsty lyricism than flying circus. This direction of repertoire could, I felt, earn the percussion concerto its long-awaited parity, something denied to it only by music waiting to happen.

Dave Maric's extensive percussion catalogue stems from his highly individual and instinctive feel for the instruments. I commissioned *Trilogy* in 2000 for my first full-length solo recital program, which toured in the United Kingdom, the United States, and Japan that season. A highly agile work, it has become a widespread multi-percussion classic, with attendant and sundry versions duly uploaded to the Internet. Following that work, others were commissioned from Maric, eventually pooled together onto the recital disc *Borrowed Time*, whose title track was written for tuned percussion and the organ of Westminster Abbey. Crucial in this case, too, was the composer's approach to the astonishing acoustic of this hallowed place, whose resonance allowed for the most remarkable kaleidoscope of chorales and sustain to emerge from the percussion instruments. With more than ten percussion-led world premieres from Maric, including a fabulous concerto largely for timbales, he remains a key part of the repertoire's diversification. At the time of writing, a new work mirroring the above-mentioned Bartók Sonata, scored for two pianos and two percussion, awaits imminent premiere.

In autumn 2005, two extremely exciting American works passed through my hands in premiere, namely Steve Mackey's *Time Release* and

Jennifer Higdon's *Percussion Concerto*. Mackey's work is a concerto for "marimba-plus," that is, surrounding the marimba-command we encounter numerous un-pitched instruments, all within easy reach. Supported by a Haydn-sized chamber orchestra, the work concentrates on a colorful and charmed interplay between soloist and ensemble. Dance-like, delightful, and maximizing the musical dividends of advanced technical demands, this is another work that added a stripe of maturity to the sleeve of the percussion soloist. When playing this concerto, one can really assume the role of a quintessentially classical concerto persona, expressive, intimate, and leading the emotional content of the music. Higdon's concerto, which had a wondrous brace of premieres – seven initial performances with the Philadelphia Orchestra including a Carnegie Hall concert – got off to an amazing start and has continued on an energetic arc ever since. I have played the work on average nearly once a month following its initiation, and the work has been taken up by countless others at many differing stages of development and study. Its ebullient orchestral palette, structural precision, and scope for an improvised cadenza give this piece exceptional appeal, and it is a joy to perform.

Two wonderful collaborations then ensued with composers of an older generation, as I began to consider what would result from approaching writers of a significantly advanced vantage point and with strong ties to the now receded twentieth century. Turning up in Helsinki simply to meet the great man, Einojuhani Rautavaara would shock me with a piano play-through of the concerto which he had already written for me in good faith, having listened to some of my recordings. The work was duly commissioned by four institutions, Philharmonics of London and Rotterdam, and the Baltimore and Tampere Symphony Orchestras. This work's orthodox structure and romantic sweep make its use of the percussion instruments sound all the more radical, for the bold statement of contemporary percussion used as lead voice in what is essentially a romantic concerto. A paradox well resolved, and a conceit also addressed by Kurt Schwertsik in his mercurial neo-classical marimba concerto *Now you hear me, now you don't*. Written for marimba and chamber-ensemble sized string section, this piece has a concerto grosso feel, Baroque, and robust with an acidic dose of Hindemith in the mischievous mix of harmonies.

The perfect foil to these two works was the arrival of a completely unclassifiable one, Simon Holt's anti-concerto *a table of noises*. Behaving like no other, this piece sought to pare down the use of the instruments to those placeable on a small, simple tabletop, plus a modest xylophone and glockenspiel. The mood of the music would be brittle and breakable, the soloist's vulnerable side exposed with somber grace, reaching a bleak, funereal conclusion. Containing some writing of almost loopy virtuosity,

this piece is also a great example of progressive collaboration with a composer. Not only did I select all the un-pitched instruments with Holt in person (careful never to break his rule of not using more than three sounds at any one time), but I also helped make important changes to the percussion parts. In this area of editing, it is paramount to pursue the music's original goals, with most writers keen to make any alterations necessary to maintain, for example, a challenging tempo. While many composers overestimate how quickly their music needs to be played to actually sound quick, it is nonetheless true that passages can often be resolved easily by note-swapping or removal to allow for a preferred velocity. Formerly, I would stick too tenaciously to a composer's first drafts, as a matter of obdurate principle, but I would like to think I have learned to occasionally let some notes go or be renegotiated in some manner. I certainly advise such a candid approach and hope that we will all leave scores and parts behind for posterity that will challenge but never needlessly. This is an essential part of the soloist's responsibility, and after each premiere I am now careful to "close" each score – signing off note changes, improvements to the notation, or, very crucially, updating tempo-markings.

### **Chamber music**

Vital to my work as a soloist has been the constant feed of collaboration through chamber music and the giving of recitals. I believe strongly that the next generation of soloists will also do well to broaden our development by exploring idiosyncratic combinations of instruments and by making their own ensembles. Joyfully, percussion lends itself to this, as we can break musical bread with just about anyone. Of central fascination to me has been my work with string quartets and my duo with Swedish trumpet soloist, Håkan Hardenberger. I have learned more about my own instruments in their company than in any other setting. The attendant camaraderie of such projects is also very uplifting, and any soloist will agree that having companions both musical and social makes for an invigorating change. I am curious to see what the next pairings may be in the field and entrust this philosophy confidently to my musical nexts of kin.

### **Solo percussion recitals**

Of a more unresolved nature remains the percussionist's solo recital, by which I mean genuinely solo, and unaccompanied by any other instruments. Despite widespread activity in this category, relatively few of its

works have bedded down as acceptable in the musical world outside of the percussion community. Percussion recitals presented in major venues to the general public remain relatively rare and full-length concerts of solo percussion music difficult to devise. Challenges include how to have enough variety of both sound and style in a program of prudent cohesion and how to build a set-list that does not necessitate a different batterie for every single piece, rendering the project impractical. Audiences tire of the dreaded “stage-change,” yet finding a way to make a program that can go from one piece to the next without undue delay can be tough. These appraisals can feel counterintuitive, as the requisite skill level has long-since been attained and is shared by a vast number of players worldwide. I feel that this repertoire is the one most in need of more convincing representation, more premieres, and more champions. I would particularly like to throw this challenge at the solo marimba literature, which, although containing highly notable exceptions, is still in need of more masterpieces. One can tire of encountering the familiarly glum faces of a handful of works time after time in the master class setting, or even more galling, a dreaded transcription. As outspoken as this may be, it is only in the hope of inspiring activity by sharing any of my minor concerns regarding the mission as a whole. My own recent *Realismos Magicos* by Rolf Wallin will, I hope, enter this discussion, and I am presently planning increased recital activity in future seasons in an effort to address this imbalance.

## **New repertoire**

The second decade of this century welcomed another wave of sensational new concertos into the repertoire, several pieces that would immediately become established through widespread repeat performances and commanding much excitement in the press. Stylistic diversity was another theme, as witnessed on one day in 2010 when I met Julia Wolfe in the morning to discuss her hip-hop inspired body-percussion concerto, and Elliott Carter in the afternoon to discuss percussion phrasing, sonority, and articulation surrounding his new double concerto for piano and percussion. It was delightful to consider this meeting of uptown and downtown aesthetics, in a Venn diagram with percussion at the center. Reviewers went on to universally herald the beauty of Elliott Carter’s *Two Controversies and a Conversation*, a masterpiece, and *The Financial Times* would judge it the right time to devote an article to the “new wave” of percussion music and performers. Kalevi Aho added what can hardly be described as anything less than a symphony for percussion and orchestra, his much-performed *Sieidi*, which swaggers through a turbulent and

riveting thirty-six minutes. James MacMillan showed that once around the block was certainly not enough, and delivered a wonderfully contrasting *Percussion Concerto No. 2*, which also featured an entirely new instrument, the sonorous aluphone. Louis Andriessen showed his lugubrious side with a percussion-led threnody with the perversely upbeat title of *Tapdance*, a ghostly Horace Silver tune, *Señor Blues*, tormenting this murky piece throughout. HK Gruber's *Into the open*, a work I premiered in July of 2015, will become the largest-scale concerto in the repertoire in terms of its colossal instrumentarium, furthermore with all the traditionally un-tuned instruments such as the numerous drums, cowbells, and blocks, assigned definite pitches. Mark-Anthony Turnage meanwhile has added a concerto for marimba and vibes to his armory, already stocked with a double concerto and a superb concerto for drum set written for Peter Erskine.

## Conclusion

What I hope to have shared through this in-depth discussion of the repertoire is my own sense of a genre being enriched and emboldened. Symphony orchestras now, when presenting a soloist beyond the established triumvirate of piano–violin–cello, are as likely to present a percussionist as anything else. The conundrum of how to present new music to this audience, largely attuned to classics of the nineteenth century, is also given a canny resolution with the physical appeal of live percussion spread over alluring setups, a great gateway to a potentially foreboding language. I am often told that my music “must be very appealing to a young audience,” and while it is, I have received even further encouragement from more seasoned concert-goers who have had their perceptions challenged then changed by their unexpected percussion adventure. The hallmark of this new wave of concerto repertoire has been its power to engage and enliven the audience, with aspects of novelty and superficiality being steadily eroded by works of gravitas, wit, splendor, and delight. Particularly encouraging is the rate of repeat performances for works passing through world premiere, in my case with one-off performances of new works being vanishingly rare. This is a crucial point, because yet again it would suggest a convincing library of pieces for which there is a compelling demand.

What happens now is of great excitement. Both London's Southbank Centre and Rotterdam's De Doelen Hall are currently running percussion festivals to celebrate this repertoire,<sup>1</sup> and a major US orchestra has just appointed a percussion soloist as a resident Artist-in-Association. The pedagogy is in immaculate condition and countless international solo

competitions continue to showcase the incoming creativity, the playing standard reaching almost baffling levels. Solo percussion is solidly established, with works of convincing maturity, courtesy of several composer and player-led paradigm shifts. It certainly needs upkeep, fresh music, and an ever-evolving instinct for its cultivation by the next generation of practitioners. This will have to include new leading spokespeople who can perform, discuss, and represent it in the broadest public sphere and who can continue to entice new listeners to our beloved sound world. Of limitless variety in color and combination, and being stylistically completely unfettered, the solo percussion movement is one of music's most enchanting stories, and one that is just beginning.

### Notes

1. Complete repertoire list for London's "Metal Wood Skin" and Rotterdam's "Frappez Toujours" Percussion Festivals, 2014–2015:

Kalevi Aho, *Sieidi*, Concerto for Percussion and Orchestra  
 Fredrik Andersson, *The Loneliness of Santa Claus*  
 Louis Andriessen, *Tapdance*  
 Béla Bartók, *Sonata for Two Pianos and Percussion*  
 Harrison Birtwistle, *The Axe Manual*  
 Anna Clyne, *Secret Garden*  
 Elliott Carter, *Figment V; Tintinnabulation*  
 Toshio Hosokawa, *Reminiscence*  
 James MacMillan, *Percussion Concerto No. 2*

Bruno Mantovani, *Moi, jeu. . .*  
 Dave Maric, *Trilogy; Trophic Cascades*  
 Steve Martland, *Horses of Instruction; Starry Night*  
 Per Norgaard, *Fire over Water* from *I Ching*  
 Joseph Pereira, *Mallet Quartet*  
 Steve Reich, *Clapping Music; Drumming, Part 1; Mallet Quartet; Music for a Large Ensemble; Music for Pieces of Wood; Quartet; Sextet*  
 Edgard Varèse, *Ionisation*  
 Kevin Volans, *Chakra*  
 Rolf Wallin, *Stonewave*  
 Julia Wolfe, *riSE and fLY*, Concerto for Percussion

## 9 Percussion theater

### The drama of performance

AIYUN HUANG

... the true state of the percussionist is that physical action. Corporeal sensibility is essentially the most definitive instrument.<sup>1</sup> STEVEN SCHICK

The most definitive percussion instrument is that of the performing body. The approach to physical action and the awareness of body defines who we are as players; it gives us character and empowers our performance. The physical action of playing, whether it is timpani in an orchestra, marimba in a solo recital, or tin cans in percussion ensemble, can equally demonstrate musicianship and deliver musical expression. Awareness of the performing body enables us to connect physical actions and turn them into meaningful sounds and musical communication.

In this chapter, I discuss repertoire that illuminates the *seeing* aspect of percussion performance through works which cultivate, dissect, and expand on the special relationship between *seeing* and *hearing*. I present two approaches to the incorporation of theater from the performer's perspective. First, the action of playing percussion is, in itself, theater; we learn to become aware of our actions and then amplify them so they become an indispensable part of our musical expression. By leveraging our theatrical potential through the lens of gesture, we are enabling percussion performance to become theater by activating the multisensory experience.

Second, in theater works, we are asked to extend our skills through the incorporation of text, singing, dancing, or a combination of these. In this approach, the members of the French percussion group *Trio le Cercle* – Willy Coquillat, Jean-Pierre Drouet, and Gaston Sylvestre – were the first generation of performers to create a repertoire of theater pieces through their collaborations with a group of composers that includes Mauricio Kagel, Georges Aperghis, and Vinko Globokar. With their boundless imagination and fearless attitude, *Trio le Cercle* was influential in incorporating theater into their roles as percussionists. In addition to performing, one member of the group, Jean-Pierre Drouet, was also an important composer of percussion theater works.

The term percussion theater is used here to refer to works in which the *seeing* aspect is crucial to the understanding of the work. Other terms have been proposed previously and used to refer to overlapping bodies of works.

These terms include *instrumental theater*, often used to refer to the works of Kagel; *théâtre musicale* commonly used to refer to the French school including the compositional works by Aperghis, Globokar, and Drouet; and *composed theater*, a term put forward by Rebstock et al. to describe composers such as Arnold Schoenberg, John Cage, Kagel, and Aperghis who “approach the theatrical stage and its means of expression as *musical material*.”<sup>2</sup>

All percussion works are inherently theatrical because of the visceral nature of percussive gesture and corporeal sensibility required of the performer. In this chapter, I focus on repertoire that requires in-depth examination by the percussionist in the use of gesture, movement, voice, and dance in the forming of an interpretation and performance. I contextualize the chapter through investigations of the ways technology, perception, composition, and performance practice have shaped the creation of percussion theater.

## **Technology**

Before the arrival of the gramophone, music was experienced live. When people attended concerts, the audience, for the most part, watched and listened to the musicians performing. Technological advancements in the last century enabled us to experience music in alternative modes through radio, sound recordings, movies, and as background music. These developments offered the audience the opportunity to compartmentalize their senses in experiencing music. As a result, new technology has at times encouraged us to experience music through our listening sense alone. In fact, as technology advanced, new types of listening emerged to couple with new technology. For example, when high fidelity arrived, many people preferred to stay at home and listen to recordings through their speakers rather than attend concerts; they argued that recordings sounded better than live music in halls with poor acoustics. When people began to use headphones, they developed a new intimacy with the music and its performers because of the proximity of the sound source to the ear.

There is no doubt that technology changed the habit of music consumption and listening experience. It also caused changes in performance standards, altered musical communication channels between performer and audience, and forced performers to shift priorities in music-making to adapt to new contexts. First, through editing, fewer mistakes are heard on discs. Over time, what we heard on recordings became the new standard for live performance. Second, performers could not always rely on the convention of a live concert to provide the multisensory communication

available to them when performing. Third, technology pushed performers to adapt to new contexts and to come up with different strategies depending on the situation. For example, the strategy used in recording a piece of music can be quite different from the strategy used in performing it (e.g., use of metronome, recording out of order). The issue of technology is relevant in this discussion because of its implication on the performer and audience relationship and its influence on the performer's approach in forming an interpretation.

## **Perception**

So much of musical communication is expressed through bodily gestures. There are two major types of distinguishable gestures in playing: instrumental and ancillary (also termed expressive) gesture. Instrumental gestures are the movements required for sound production while ancillary gestures are not required for sound production, but play a crucial role in the understanding of musical intention. Musicians use ancillary gestures intuitively and/or consciously to form an inherent relationship with the music.<sup>3</sup>

Ancillary gestures are essential and crucial in musical expression both from the performer to the audience in music-sharing and among musicians in music-making.<sup>4</sup> For example, ancillary gestures may include gestures to signal structural points to help audiences anticipate and participate in the drama of music. Ancillary gestures are essential in chamber music playing as the bodily gestures can greatly affect synchronicity. Seeing the music helps the audience comprehend a deeper dimension of communication that hearing alone cannot always convey.

Michael Schutz and Scott Lipscomb used a professional marimbist, Michael Burritt, as a subject to test audience perception of long notes versus short notes.<sup>5</sup> The study recorded video and audio (separately) of Burritt playing long and short notes on three registers (high, middle, low) of the marimba. In addition, dampened strokes were recorded and used for audio only. The audio and the visual recordings were separated to create different pairings (e.g., short note visual with long note audio), and these examples were then tested on subjects (Northwestern University non-percussion music students). The study found that, first, there is no audible difference between the stroke types – the decay of the short stroke is indistinguishable from that of the long stroke. Second, the subjects determined the length of the stroke primarily through the visual representation of the stroke length rather than through the length of the sound. Last, while unable to create notes that were acoustically long and short, Burritt created

long and short *sounding* notes through gestural conditioning in the audience's perception. The sensory integration communicated the musical idea and covered up the acoustical shortcoming of the marimba.<sup>6</sup> More recent studies by Vines et al. examined nonverbal communication through "expressive body movement and musical sound, and found that musical expressive intention had the greatest impact when the music was seen"<sup>7</sup> (rather than heard or heard and seen at the same time).

These studies affirm thoughts in my own musical experience as a listener and performer. First, a multisensory experience is the preferred way to experience music-making. By omitting visual information, both the performer and the audience are "robbed" of true musical communication. Second, percussionists have long used their intuition to "act out" what their instruments cannot naturally do. Furthermore, the short history of contemporary percussion has allowed percussionists to be explorers without following established performance traditions. This helps explain why percussionists are willing to accept, and furthermore to embrace, challenges when asked to extend their performing bodies to incorporate other elements.

## Compositional development

Many composers have taken special interest in the gestures of percussion playing and have made the specifics of percussive gestures (e.g., preparatory, sounding, or silent) essential musical material in their compositions. Cage's approach to theater in the 1950s and Kagel's instrumental theater are perhaps the most influential departure points.

In his 1937 "The Future of Music: Credo,"<sup>8</sup> Cage put forward the notion that music is the organization of sound (including noise and silence), and "percussion music is a contemporary transition from keyboard-influenced music to the all-sound music of the future."<sup>9</sup> Cage taught us to appreciate noise not as "the other" but as an integral part of music. With this belief, Cage wrote his first percussion ensemble works between the late 1930s and early 1940s, putting himself, historically and intellectually, in line with Edgard Varèse and his composition *Ionisation*. In the 1950s, Cage put forward two ideas that formed his approach to theater: give up control of material as a creator and solicit an active role in the listeners. His approach to theater was fundamentally a philosophical one – if we transform our perspectives by embracing our surroundings and listening to them with a fresh sensibility we elevate everyday chaos onto the platform of theater. Our mundane world could suddenly become theater by the sheer perceptual change in how we sense and engage with the environment. Cage's *4'33"* (1952) is as much a

**Example 9.1** *Dressur*, “chair” instructions, mm. 5–8.

4) Stuhl anheben und sogleich auf den Boden fallen lassen  
lift chair, and immediately let fall on to the floor

verharren! Hände auf der Stuhllehne lassen  
motionless! leave hands on chair back

simile

verharren! Hände auf Stuhllehne  
motionless! hands on chair back

*fff*

*f(!)*

ANFANGSAUFSTELLUNG/  
INITIAL POSITION

▼ = Körper- bzw. Blickrichtung  
body or direction of sight

PUBLIKUM  
AUDIENCE

**Figure 9.1** *Dressur*, opening stage direction.

theatrical work as a musical composition. By allowing ourselves to sit and listen to the sounds of a space and then watch how the people behave and interact with others and with the space, we enter a theatrical temple with our shift in perception. *4'33''* is a musical composition; it has a published score and is performed in three movements. However, the experience of *4'33''* is largely a theatrical one for both the audience and the performer. Cage said, “Where do we go from here? Towards theater. That art more than music resembles nature. We have eyes as well as ears, and it is our business while we are alive to use them.”<sup>10</sup>

Kagel’s exploration into theater came shortly after Cage’s. His *instrumental theater* works are built on a different set of principles, full of rigor and systematically researched in all aspects, and no doubt the most influential pieces of his creative output. Kagel composed his music with meticulous precision. He asserted absolute control over musical material and instructions for performing his works. Figure 9.1 is from *Dressur* (1976–1977) composed for *Trio le Cercle*.

This stage diagram shows the opening position of the three players with the specific instruction on the body direction each player should face (indicated with a triangle).

In Example 9.1, Kagel describes exactly when and how to put a chair onto the floor. He asks for the player to first “lift the chair and immediately let fall on to the floor,” and then “motionless! Leave hands on chair back.” The first time is marked *fff* and the second time is marked *f(!)*.

The beginning of the score contains five pages of annotation on the specific instruments used in the piece. At the end of the instrumental annotation, the instruction reads:

#### Actions

Such musical events as occur within the context of a scenic “plot” require rigour and concentration. One must renounce to every kind of facial expressions and gestures which might be misunderstood as means of putting across a particular “content.”<sup>11</sup>

At first reading, this instruction seems to go against my argument of using gesture to amplify musical intention. A closer look will give a different reading. Kagel never expected or wanted musicians to become actors. In fact, he discouraged acting in musicians as he felt that musicians are best at playing their instruments. The thought of acting will only distract musicians from playing their instruments. By asking the players to “renounce to every kind of facial expressions and gestures” and keep to the score, Kagel has in fact brilliantly designed a way to amplify his own prescribed gestures and theatrical expressions by discouraging others. By following this action direction, the performers in *Dressur* can naturally amplify all musical gestures in the piece to deliver a successful theatrical performance.

### **?Corporel (1985) by Vinko Globokar (b. 1934)**

?Corporel was written as part of *Laboratorium* (1973–1985), a large collection of solo and chamber works for an ensemble of ten players including two percussionists. In *Laboratorium*, Globokar wrote one piece for ten players, two pieces for nine players, three pieces for eight players, and so on, including two percussion solos: *Toucher* (1973) for Jean-Pierre Drouet and ?Corporel (1985) for Gaston Sylvestre. In *Laboratorium*, Globokar studied and focused on a single issue in each piece, and in ?Corporel, he examined the issue of sound by using the body as the instrument. Original sound sources were mapped out using a male body. Globokar speaks about how he found his sound sources:

I first determined the different ways to produce the sound: finger, fist, flat hand, hitting, caressing, sliding, etc. I then explored the places on the body where to produce the sounds, considering areas where the bones are just under the skin like in the head, or if there are muscles separating bones and skin like in the stomach or thigh. Later, I added vocal sounds with the idea to imitate percussion sounds produced on the body using the voice. Finally I introduced a spoken verse written by the French Poet René Char.<sup>12</sup>

The opening instruction says “in canvas trousers, bare-chested, barefoot. Seated on the ground, facing the audience. Stage lighting. Amplification.”<sup>13</sup> Although Globokar does not specify exactly how to light the stage, he states that stage lighting will help draw the audience’s attention to amplify the presence of the performing body and, by extension, amplify the physical

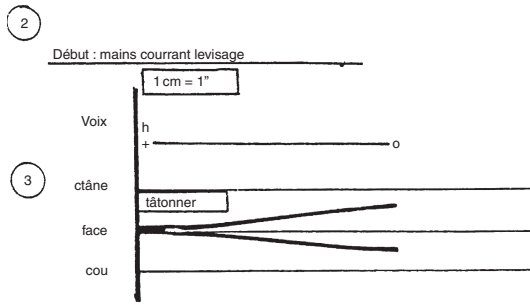


Figure 9.2 *Corporel*, opening.

gestures. By the simple lighting request, Globokar changes a concert space into a theater, thereby asking the audience to pay extra attention to the movements and listen with their eyes open. By using amplification, he allows the audience to hear soft sounds presented in this work that can easily disappear in a large space. With these instructions, Globokar contextualizes the body as a musical instrument.

In Figure 9.2, there are four lines in the score: the top line represents the voice; the second line represents the head; the third line represents the face; and the bottom line represents the neck. On the very top, the phrase translates as “beginning, hands cover the face.” In the middle, it says to “grope.” In addition, one centimeter on the page is equal to one second in time on an original size score.

The voice produces the sound “h” from the position of mouth closed (+) to the position of mouth open (o). In the process of producing the sound from a closed position to an open position, there is a natural crescendo that comes with the gradual opening of the mouth. In this case, the mouth acts as an amplifier to project the sound “h” into space. Using the vocal sound as a guide, the hands become the visual representation of the voice in this opening line to “act out” the crescendo with an increasing speed of the gesture. Using the French word *tâtonner* (grope) as the metaphor, the hands can feel the skin on the face as to pull open the mouth to let the sound out.

It is fascinating for a player to discover what sounds a body can make. By combining these sounds into lines and then layering the lines, the player creates polyphony. However, in order to have all sounds heard, I use the strategy of “gesture as volume control” to amplify the perception of sound, and to further create cohesion between movement and voice.

Figure 9.3 uses the actions of scratching and pressing in order to produce two musical lines. The solid line in the shape of a rainbow represents one

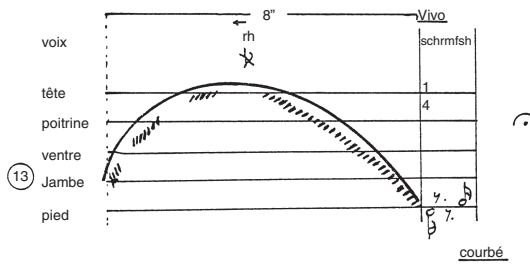


Figure 9.3 ?*Corporel*, m. 13.

hand pressing onto the body while the second line – underneath the solid line and marked with slashes – means to scratch. The notation instructs the player to start at the leg (*jambe*) pressing with one hand while scratching with the other, and continue the motion while going up the torso until reaching the head. When the hands reach the top of the head, say “ah,” and then come down the torso pressing and scratching all the way to the foot. Scratching is a universal human expression; both the performer and audience have the memory of scratching based on past experience. As a performer scratches him/herself in performance, the memory of scratching is triggered in the audience. By using gesture as volume control to amplify the present and trigger the past, the performance of ?*Corporel* becomes an interwoven musical experience between the present (sounds heard in the space) and the past (sound stored in the audience’s memory). It is possible that the listener does not hear the performer scratching his/her skin from the back of the hall. However, when the listener sees the performer scratching, the memory of the sound of scratching is activated in the listener and a musical communication is established.

### ***Aphasia* (2010) by Mark Applebaum (b. 1967)**

In a more recent work, *Aphasia* by American composer Mark Applebaum, the composer takes the idea of musical gesture to a different level through an ingeniously designed and annotated set of hand gestures to a prerecorded soundtrack. Applebaum originally wrote the piece for baritone Nicholas Isherwood, but the piece has been adopted into the percussion repertoire. Why does the percussionist feel compelled to take on a piece in which no percussive sounds are made and all the player does is to wave his/her hands? It certainly does not require the specific training of a percussionist to execute such a work! It is an increasingly popular piece with percussionists, evidenced by its widespread use by performers on recital

1 4/4 ♩ = 60      4/4 ♩ = 66

0:00      0:01      0:02      0:03

♩ 60 00      ♩ 65 46

1/4      4/4

1|1      2|1      2|2      2|3

Aphasia Mono

[NOTATED RHYTHMS APPROXIMATE TAPE]

(ANTICIPATION)

UCK

CENTURION GREETING

R

L

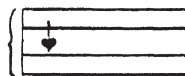
Figure 9.4 *Aphasia*, m. 1.

programs. What is significant about this piece that teaches us about being a percussionist?

Figure 9.4 is an excerpt from the score of *Aphasia* that shows a prerecorded soundtrack with a detailed notation of what is on it and what the performer is supposed to do and when. In fact, learning *Aphasia* is an extension of learning *Corporel*, but in *Aphasia*, the performer is left to interpret the timing delivery of the imaginary sounding gestures, but not the sounds themselves. It is only natural for us to gravitate toward physical gestures as a form of musical communication. Think about how Burritt's legato notes were understood through the gestures. This is why percussionists eagerly adopted *Aphasia* into their repertoire. Each gesture is precisely drawn as a pictogram to mark the arrival timing of a gesture on the score. The performer is seated using the reach of his/her arms to create the illusion of a frame and perform various gestures forming a contemporary *tableau vivant*. While there is tactile information missing in the performance of *Aphasia*, the piece trains the performer to use a similar reflex and apply the rigor of precise timing as if one is performing a multi-percussion solo.



Les Pointes - The Fingertips



Par un mouvement d'élévation du poignet, seule l'extrémité des doigts tendus frappe la surface de la table.

La main en complète extension, en L par rapport à l'avant-bras.

*By raising and lowering the wrist, just the fingertips strike the table. The bend at the wrist should make an L with the forearm.*

Figure 9.5 *Musique de Table*, instructions.

### ***Musique de Table* (1987) by Thierry de Mey (b. 1956)**

Thierry de Mey teases out the relationship between gesture and sound through the lens of composer, choreographer, and cinematographer. In his work *Musique de Table*,<sup>14</sup> he choreographed three pairs of hands acting as ballerinas and drummers through sounding movements of dancing, tapping, sliding, and hitting, all performed on three pieces of wood (amplified through contact microphones). The composer asks the performer to be immobile except for his/her hands. Lighting focuses on the hands and excludes the face. The notation is specific in terms of hand movements. In Figure 9.5, de Mey depicts the use of fingertips on the board like *les pointes* – a ballet move with the tip of the toes.

### ***Les Guetteurs de Sons* (1981) by Georges Aperghis (b. 1945)**

*Trio le Cercle* premiered *Les Guetteurs de Sons*<sup>15</sup> by Aperghis in Festival de Saint-Denis in 1982.<sup>16</sup> It is performed with specific lighting designs involving three circles – each corresponds to one of the drum pairs and a player. Prior to *Les Guetteurs de Sons*, Aperghis wrote *Le Corps à Corps* for Jean-Pierre Drouet, in which Drouet used traditional Persian *tombak* techniques to create the musical material in the storytelling of a motorcycle race. In *Les Guetteurs de Sons*, Aperghis uses gesture, vocal sounds, and text to construct an abstract narrative of three lives from the stage of infancy through old age. He dissects basic percussion gestures in order to create drama and tension. The basic movement of drumming can be described as the arm moving down toward the skin and moving up away from it. Aperghis divided this movement into two parts: “up” and “down” as two separate musical actions and notated them separated with arrows pointing up and down.

Example 9.2 shows the notation for player one from measure 24 to measure 30. Measure 24 indicates the right arm moving down (with a downward arrow) toward the drumhead on the downbeat and moving up

**Example 9.2** *Les Guetteurs de Sons*, mm. 24–30.

(with an upward arrow) on the second thirty-second note with silent strokes (marked with white note heads). Measure 26 shows skillful finger drumming combined with pitch modulation. Pitch modulation on a drum can be produced by applying pressure to the center of the drum or isolating vibration from part of the skin.

Aperghis uses two types of vocal sounds in this work: nonsense syllables and text. There are two goals in the use of the nonsense syllables – first is to imitate the drum sounds and second is to create the player’s own drumming language through each of the three separate and distinctive musical characters that are established. The performers are free to design syllables corresponding to drum notes in certain passages, for example, the vocal line in measure 26 in Example 9.2. The composer does not indicate which syllables to use in this passage; the decisions are left to the performer. Once the syllables are chosen, the relationship between the syllables and notation is fixed with exact correspondence through the piece.

The second type of vocal sound is text. The original text is in French, and understanding the text is important in this work, in particular the phrase, “*Je dirai presque que le bruit est nécessaire parce qu’il évite de trop penser*” (“I would almost say that noise is necessary because it prevents one from thinking too much”). Aperghis has summarized his underlying philosophy toward the work in this phrase. He encourages the translation of the French text into the performer’s native language and/or to the language of the audience. This translation of the text into another language is crucial in forming the interpretation because most performers can produce stronger and more convincing delivery in their native language.

In Example 9.3, four short fragments “*Le silence, J’entends, Le bourdonnement, Il y a, J’ai l’impression de, Je ne sais pas*” (“The silence, I hear, the humming, there is, I have the impression of, I do not know”) are used to create a blanket of textual noise. The text is notated with precise rhythm. By using a language, but not always following its natural syntax and rhythmic flow, Aperghis creates a situation to allow other interpretations

Example 9.3 *Les Guetteurs de Sons*, m. 187.

The musical score for Example 9.3, *Les Guetteurs de Sons*, measure 187, is presented in three systems. Each system includes a vocal line and three percussion lines (M.D., M.G., G.C.).

**System 1:**  
 Voix 1: j'ai l'im-pression il y a le le si - lence le bour-don-ne - ment j'en - tends le bour-don - ne-ment le si-lence  
 M.D., M.G., G.C.: *ff*

**System 2:**  
 Voix 2: le si - lence le bour-don-ne-ment j'en-tends le bour-don-ne-ment et le si-lence j'ai l'im-pres-sion il y a le  
 M.D., M.G., G.C.: *ff*

**System 3:**  
 Voix 3: j'en-tends le bour-don-ne - ment le si-lence j'ai l'im-pres-sion il y a le le si - lence le si-lence j'entends le si-lence  
 M.D., M.G., G.C.: *ff*



Figure 9.6 Aiyun Huang in performance.

and experiences using the same set of words. Perhaps, the goal of using text in his music is not all about understanding the text as words! By setting the text in rhythm and using them in fragments, Aperghis abstracted the text by creating a layer of noise and misunderstanding, thus offering us multiple perspectives into the interpretation of the work. By dissecting percussive gesture and combining use of text in nonconventional ways, he created a provoking and abstract narrative to the work.

### ***Variations sur un texte de Victor Hugo (1991)* by Jean-Pierre Drouet (b. 1935)**

In contrast to Aperghis' abstract approach to theater, Drouet's approach shows a direct and effective combination of drumming, singing, and dancing. *Variations sur un texte de Victor Hugo* was written for Quatuor Hélios, a French percussion group formed by Isabelle Berteletti, Jean-Christophe Feldhandler, Florent Haladjian, and Lê Quan Ninh. The piece is divided into three sections: drums with voice, dance with voice, and finally marimba with voice. Since the piece was a commission, the dance was designed to fit the genders of the group, one female (player one) and three male players.

In this piece, Drouet expresses a critical view of the world through extending the performers' skills to include singing and dancing as well as through the use of instruments, setups, and staging. First, Drouet articulates the dichotomy between the façade that we live in and the reality that we deny. To achieve this dichotomy in the piece, the players use the floor-tom facing the audience (as a façade) and a tray of voice-matching instruments facing the back (as a denied reality). When the performers play the tom-toms, the expressive markings are usually calm and pleasant. On the other hand, the notation for the rear-facing musicians calls upon them to use various noisemakers in imitation of specified voice sounds. These consist of animal sounds – such as a snorting pig, and other nasal, ugly voices (see Example 9.4).

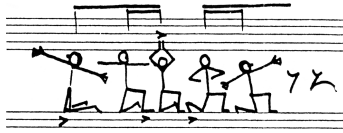
Second, Drouet uses an excerpt from Victor Hugo's *Les Misérables* (1862) to make a comparison between Hugo's time and our time – to

**Example 9.4** *Victor Hugo*, animal sounds.

The image shows a musical score for a percussion ensemble. It consists of a single staff with a treble clef and a 2/4 time signature. The notation includes rhythmic patterns represented by vertical stems and horizontal lines, along with various sound effects and animal noises written in a stylized, handwritten font. The notation is divided into three measures by vertical bar lines. The first measure has a 'P' marking below the staff. The second measure has a 'P' marking below the staff. The third measure has a 'P' marking below the staff. The sound effects include 'PFFF', 'HRRR', 'PFFF', 'SSS i u i u i u', 'Huu', 'Pou! Pou! Pou! Ho', 'Frrr', 'ou! ou! ou!', 'ou! Hu', 'Prrrr', 'Nouuu', 'Pli', 'SSSRARRR', 'CHL', 'Trrrrrr', 'Hrrr', 'P Prrrr', 'P Prrr', 'RRRR', 'A', 'Hu', 'PF', 'Prrr', 'PFFF', 'ou', 'ou', 'ou', 'PFFF', 'ou'.

Example 9.5 Victor Hugo, text.

Example 9.6 Victor Hugo, dance movements.



demonstrate that Hugo's predictions about the future did not come true (see Example 9.5). In *Les Misérables*, Hugo expressed his expectations that in the twentieth century people would live in an ideal society where there would be no fear. It is clear that we still struggle with some of the same issues in different manifestations from Hugo's time.

Third, Drouet uses dance to express the peak of his frustration with the world (see Example 9.6). During the press conference for the performance of *Variations sur un texte de Victor Hugo* on March 18, 1998, in Taipei, a reporter asked Drouet "why is there dance in the piece?" Drouet replied by relating his feelings that he could no longer express what he wanted to say through music and text; therefore, dance was a natural choice of expressive medium for the climax of the piece. The dance in this piece is very percussive, employing techniques derived from tap-dance and flamenco. The extended skills in this work require the players to step outside of their usual roles in order to successfully perform their tasks. Some dance and voice coaching is recommended in order to play the piece with conviction.

## Conclusion

In *Dressur*, the performers are encouraged to renounce all extra gestures in order to highlight the ones indicated in the score. *Corporel* uses gesture to amplify sound as a visual volume control to form a coherent musical interpretation between sound and movement while in *Aphasia*, gestures are used to create visual tableaux with precise timing similar to performing multi-percussion. In *Musique de table*, the hands are the ballerina-drummer performing a compositional choreography. In *Les Guetteurs de Sons*, three musical characters are formed through the dissection and expansion on percussive gesture, voice, and text. The percussionists in

*Variations sur un texte de Victor Hugo* are asked to become singers and dancers in addition to playing percussion in order to fully express the musical intention of the composer. All the works presented in this chapter have fully notated musical scores sharing the following: first, the score gives stage directions; second, the score asks for stage lighting; and third, the notation is very specific to include not only pitch and rhythm, but also a set of instructions in order to perform the exact actions through space in time. All the compositions ask the performers to empower their theatrical potential through the embracing of their performing bodies. They demonstrate that the percussionist can approach theater through the simple shift in perception as Cage has suggested, through leveraging the impact of performance gestures so that they become more readable, through understanding how to use the voice as an extension of the performing body, and finally through the learning of other skills that allow the player to step into roles other than traditional percussion performance.

### Notes

1. F. J. Oteri, "Steven Schick: Ready for Anything" (April 1, 2004) ([www.newmusicbox.org](http://www.newmusicbox.org)).
2. M. Rebstock and D. Roesner (eds.), *Composed Theatre: Aesthetics, Practices, Processes* (University of Chicago Press, 2012), p. 9.
3. M. Nusseck and M. M. Wanderley, "Music and Motion – How Music-related Ancillary Body Movements Contribute to the Experience of Music," *Music Perception*, vol. 26, no. 4 (2009), 335–53.
4. C. Palmer, "Music Performance: Movement and Coordination," in Diana Deutsch (ed.), *The Psychology of Music*, 3rd ed. (Amsterdam: Elsevier Press, 2013), pp. 405–22.
5. For woodwind, brass, and string instruments, long notes are generally produced through continuous movement of breath or bowing. For percussion, long notes are produced either through roll (combining many short tones together to create the illusion of long tone), pedal (vibraphone), or gesture.
6. M. Schutz and S. Lipscomb, "Hearing Gestures, Seeing Music: Vision Influences Perceived Tone Duration," *Perception*, 36 (2007), 888–97. For more detailed information, see Michael Schutz's article, "Lessons from the laboratory," Chapter 20.
7. B. W. Vines, C. L. Krumhansl, M. M. Wanderley, I. M. Dalca, and D. J. Levitin, "Music to My Eyes: Cross-modal Interactions in the Perception of Emotions in Musical Performance," *Cognition*, 118 (2011), 157–70.
8. J. Cage, *Silence* (Wesleyan University Press, 2010), pp. 3–6.
9. *Ibid.*, p. 5.
10. *Ibid.*, p. 12.
11. M. Kagel, *Dressur* (Frankfurt: Henry Litolf's Verlag/C.F. Peters, 1983).
12. F. V. Kumor, *Interpreting the Relationship Between Movement and Music in Selected Twentieth Century Percussion Music*, unpublished DMA thesis, Kentucky (2002), p. 49.
13. V. Globokar, *?Corporel* (New York: C. F. Peters, 1989).
14. T. de Mey, *Musique de Table* (Tienen, Belgium: PM Europe Publications, 1987).
15. Drouet plays part one, Coquillat part two, and Sylvestre part three.
16. The score of *Les Guetteurs de Sons* was published by Edition Salabert, but the score is currently out of print. A PDF copy is available for download from the composer's website (<http://aperghis.com>).

## 10 Three convergences

### A percussionist learns to conduct

STEVEN SCHICK

If it's true what they say that tragedy plus time equals comedy, I might just be ready to laugh at my first rehearsals as an orchestral conductor. I can smile a little now, but every one of those early rehearsals was an exercise in humility, if not humiliation.

Let me say in my defense that I never planned to be a conductor. I never trained for it; never conducted along with records, or imagined myself on the podium communing with Mahler or late Beethoven. To the contrary, my path as a contemporary percussionist led me away from the refinements of classical music. I was more at home in the wind-swept xeriscape of Xenakis than in the pruned garden of Mozart. But then one day eight years ago, I sat in on a meeting at the University of California, San Diego with the administration of the La Jolla Symphony and Chorus. I was there as a courtesy, a faculty member representing the department's Executive Committee. The conductor of the La Jolla Symphony had just stepped down and the search was on for guest conductors. Their question floated in the room: as they planned a formal search for a new music director, did we know anyone who could conduct a concert on relatively short notice? In a kind of out-of-body experience, I saw myself raise my hand and suggest that I could lead a concert. The chair of my department looked at me with incredulity. "But, you don't know how to conduct!" "True," I answered. "But, how hard could it be?"

At the beginning, it was more than simply hard; it was truly painful. Several times, I forgot to wait for the tuning note and simply started rehearsing. Once trying to solve a sight-line problem, I moved one of the string players more and more to her right until she finally exclaimed, "But I'm a violinist!" Uncomfortable questions pelted me like freezing rain. Should a certain bowing be hooked? What kind of mute should a trombonist use? Where on the bow should a passage be played? And, God forbid I'd have to sight-read a chord involving horns, alto flute, and E-flat clarinet. The transpositions alone were killing me! In response, I did blank stares the way Meryl Streep does accents: more often than you'd like and usually at the worst moments.

Little by little I made headway. And, in the end that first concert was pretty OK. Actually, it was more than OK; it was invigorating! Even

choosing the program was fascinating. Since I thought that I was going to conduct precisely one orchestral concert in my life, programming was an exercise in option anxiety. I was coming from a discipline that had perhaps twenty good pieces, and suddenly found myself with a choice of hundreds. Eventually, I selected a short overture by my friend David Lang, *International Business Machine*, and the *Crouching Tiger Concerto* by Tan Dun featuring another friend, the wonderful cellist Wendy Sutter, who had been a band-mate in the Bang on a Can All-Stars. Finally, I opted for a total indulgence for a neophyte: the suite from the 1911 version of Stravinsky's *Firebird*. It was so much fun! I fell in love with the music and with the orchestra. The La Jolla Symphony was (and still is) a very fine amateur ensemble, full of dedicated musicians most of whom make their livings outside of music. Add some UC San Diego students and local professionals looking for an orchestral outlet, and you have a group that can really play and who come to each rehearsal with passion and good will. I might not immediately have known how rare that was, but the positive experience of my first concert convinced me to put my name into the running for the music director position. And – really, this came as a surprise to all of us – I won the job.

Now with the job actually in hand, my need to move beyond “not-bad-for-someone-who-doesn't-conduct” required serious analysis and lots of work. One of my biggest problems was that I didn't know what it meant to “learn a score” as a conductor. As a percussionist, the task of learning a piece of music was very clear: you have learned it when you can execute it reliably and repeatably at a level sufficiently high for concert presentation. If you satisfy these criteria, you know the piece, if not, go back to the practice room. However, the metrics of learning an orchestral score seemed murkier to me. Did I know a score when I had understood and analyzed the piece? Or was it when I was able to conduct a first rehearsal? Or, did I know a piece once I had actually conducted it in performance? Or, frighteningly, perhaps I would never truly know a piece, since as conductor, I make no sounds and play no instruments.

### **Conducting is externalizing a system of organization**

At first it seemed that my experiences as a percussionist – those tens of thousands of hours of practice and performance – might not help me become a competent conductor. Then in a realization that has made all the difference, I discovered a convergence, an area of significant overlap between my old life as an experienced percussionist and my new life as a novice conductor. I realized that being an instrumentalist, in the traditional

sense, means internalizing a language of organization. But as an experimental percussionist – and, importantly, also as a conductor – the ability to externalize a system of organization was paramount.

A system that internalizes is easy to understand. You hear performers say something like this all the time: “I want to be one with my instrument.” That essentially means reimagining a foreign object – the instrument you’re playing – as an extension of your body. The most successful players so thoroughly anthropomorphize their instruments that there seems to be no difference between them. The cello is no longer a wooden box; it is a torso. The tuba is not a hunk of metal, but a kind of lung. In the hands of the best performers, the instrument becomes not just an extension of the body, but the body itself.

In this sense, percussionists are sometimes “internalists.” Marimbists, timpanists, or vibists, like other traditional instrumentalists, seek to meld with their instruments to create a meta-body – a hybridized creature that is part human and part instrument. But this model does not always work in the percussion family. While objects like the marimba, vibraphone, and timpani *are* instruments in the traditional sense, many other objects a percussionist uses – a brake drum, a thunder-sheet, or a tin can – are not. Is it actually possible to anthropomorphize a foam-mounted railroad spike? And what psychic dangers await a percussionist who seeks to become one with a tuned saw blade?

For performers of these nontraditional instruments, a more useful system is external. An external system of organization reverses the paradigm: while an internal system redefines a foreign object as an extension of the body, with external organization the body is an extension of the object. In short, when I play a percussion piece with noninstrumental sounding objects (read, “pieces of junk”), I become the junk; the junk does not become me.

What does this mean in practical terms? When I play Iannis Xenakis’ *Psappha*, a work replete in my version with objects of junk, from a frying pan to short steel pipes to hunks of u-shaped steel and planks of hard wood, my mind and manner become attuned to the world of junk, not the reverse. My movements in performance become spiky; my mental models are industrial and utilitarian, not organic and anthropological. Even the rhythmic language changes, divorcing itself from the *bel canto* model, which dictates that musical phrases are timed to the breath. In a *bel canto* world (the ultimate internal system since nothing is more inside of us than our voices), antecedent and consequent musical phrases resemble inhalation and exhalation. So common is this model that we no longer question it. However, listen to Mozart played by a flutist who can circular breathe and you will know how foreign traditional phrases can sound

when they do not conform to the need to breathe. My installations of junk function more like machines than bodies. Therefore, musical phrases are governed by the rules of the machine, not the body, and are subject in length only to the need for routine maintenance and the skill of the operator. Melodic moments can extend far beyond the length of a breath, and the instrumental color palette does not seek to blend, as in an organic model, but often is highly differentiated. The dynamic range from soft to loud is extreme.

This is what can happen to percussion playing when viewed through an external model. As a beginning conductor, I also learned to view the orchestra through the lens of an external system. Again, I become it; it does not become me. One important consequence of external orientation is that physical space becomes an important arena of expression. With internal systems, the goal is to reduce the distance between instrument and body, therefore rendering space moot as an agent of expression. Space becomes nearly meaningless as a signifier. But viewed the other way around, it becomes, well, huge. In a small example, I have developed the ability to track a phrase that moves from violins to upper woodwinds not only as the change of pitch over time, but also as a change of the position of a sound in space. (This feels very much like playing Stockhausen's *Zyklus*, when at a given moment the snare drum is clearly to my right and the gong to my left, in such a way that their interplay creates a spatially rich melody.) At the time of this writing, I am preparing for three performances of Hector Berlioz's *Requiem*. In many moments of this mighty work, little else is happening than a single chord diffused in space. In these Gabrielli-like passages, the orchestral sound saturates the space. Accordingly the ear of the auditor, at least metaphorically, expands to the size of the hall itself.

An important implication of sounds moving in space leads to gesture, a core concern of any conductor. In the La Jolla Symphony, the high strings are to my left and the low ones to my right. Accordingly, this means that harmonic changes based on root movements emanate from my right and migrate across the space to my left. The low strings frequently play slower music and speak less incisively than their higher partners. As a result, my physical language has evolved so that, in very general terms, my right hand gives larger and less incisive cues than does my left. My body reacts to the demands of the orchestra and not the reverse. Again, I have become it, not it me.

In a way, reversing the organizational paradigm to embrace an outward-looking rather than inward-looking model was its own reward. This eversion of basic premises was an invitation to reverse course in many other areas. I started by revisiting my commitment to performing from memory, a practice I have engaged in with dozens of pieces in a thousand

or more solo percussion concerts over more than forty years. My mantra has always been, first memorize, then master, then perform. Playing from memory is not really playing without a score; it is the act of rewriting the score on the muscles and mind of a player. Literally, internalizing it. But as a conductor, I have explicitly sought to externalize my method of learning a score by consciously avoiding memorizing.

As a percussionist, I never mark my scores. After all, the true score is the body. As a conductor, thinking externally, I mark liberally. I draw carefully, using a straight edge and well-sharpened pencils in several colors to create a document, which will serve simultaneously as a performance score and a kind of journal. I highlight harmonic changes in blue; formal points of arrival in green; tempo changes, dynamics, and cues in red. I use lead pencil (the indispensable Blackfeet Indian Pencil, to which my friend John Luther Adams introduced me) to sketch precise lines that connect one melodic idea to another. (My score of Arnold Schoenberg's *Five Pieces* looks like a map of the London Underground, thanks to the large number of interpenetrated and contrapuntal melodic lines.) I make copious notes in the margins about interpretative strategies, to-do lists for rehearsals, even notes about where I am traveling or what I am reading. For large and complex works, I also draw models on graph paper, showing the event horizon for sections or even entire pieces. I once made such an event map for an entire concert of the chamber music of Edgard Varèse at the scale of one minute to one inch. It became a twelve foot long, multicolor chart of musical "zones of intensity," to use Varèse's own term.

My goal in all of this has been to take what had become a comfortable internal process as a percussionist and invert it. Recently, after playing a solo percussion concert in Paris at the Centre Pompidou, Renzo Piano, and Richard Rogers's spectacular building at the Beaubourg, which has all of the internal guts of plumbing, air ducts, and stairways on the outside, I realized I was looking at an effective model for my approach to conducting. Just as the inner workings of the building are on the outside, so are the mechanics of conducting. The goal for a conductor is to translate thought to gesture, taking, therefore, what is on the inside, visible to no one, and placing it on the outside visible to everyone. At the most expressive moments of a performance, a conductor completely transports the internal world of musical idea and interpretative impulse to an external mode of physical expression. When that happens, he or she is empty, ready to be buoyed by the waves of sound and moved in any direction the power of the music dictates. The body ceases to have the singular function of expression on behalf of the one and turns to the evident and difficult task of expression on behalf of the many. And this all happens through a small repertoire of fairly banal gestures.



Figure 10.1 Steven Schick.

## Conducting is gesturing

I estimate that it takes approximately thirty minutes to learn how to conduct. And most of that is learning how to handle cut-offs and fermatas. The rest can be summed up more or less by the phrase, “beat one goes down.” Everything else about becoming a good conductor – and yes there is a lot – falls under the category of becoming a good musician. Nevertheless, the language of conducting is gesture, so perhaps it does warrant a moment of reflection.

In conducting, like percussion, serious misunderstandings arise in reducing the gestural language to the simple vectors of up and down. It’s true that beat one goes down, just as it’s true that a stroke on the snare drum goes down. But in both cases, the active mechanics of the stroke and its expressive potential are encoded not in the downstroke but in the upstroke – in the preparation.

Recently, the eminent composer Chou Wen-chung and I were discussing a new work he plans to write for the San Francisco Contemporary Music Players, of which I am artistic director. Wen-chung’s idea is to translate the art of Chinese calligraphy to a musical score. In particular, he is interested in the way the meaning of a calligraphic character is collected in the tip of the brush at the height of its arc of preparation, just before it descends to the paper. “You must have the entire character – both its shape and its meaning in mind – before you lower the brush to paper,” he told me. “Calligraphy is not expression in a western sense,” he continued, “where meaning is pieced together, post facto, by assembling the sense of a phrase from a sequence of letters. Everything must be present together in pre-existing unity before any motion is made.”

Yes.

But that means giving up a lot of control. Through a preparatory stroke, a conductor can prepare an ensemble to play by showing them when to play, just as a percussionist can prepare a sound by raising a stick, but the actual making of the sound cannot be controlled. The drumstick drops; the breath is expelled; the bow is lowered to the string. In each case, this is the natural consequence of the preparation. By the time the baton starts its downward motion to the downbeat, it's too late to change anything. The moment of agency, when a message may be imparted, exists only in the preparation. Therefore, the trick to executing a basic conducting pattern like 4/4 is to see each affirmative stroke not as a certain beat, but as the preparation for the beat that comes next. The downbeat, including the little rebound at the bottom of the stroke, is a preparatory movement that tells us where the second beat will fall. The second beat is the preparation for the third, and so on. So a typical conducting pattern then is simply a sequence of preparations, each stroke loading a musical moment with potential energy. The release of that energy is the province of the players, not the conductor. And in parallel fashion, each stroke on a percussion instrument creates a natural rebound that will provide the preparatory stroke for the following attack, again a succession of potentialities realized primarily by means of gravity rather than any action by the player.

It is a psychic arena that takes a little getting used to. The common image of both conductor and percussionist is a person (usually a man) of action. A drummer or conductor is epitomized by sweat, grim determination, and above all intense physicality. The realization that the task is nothing but a sequence of intentions, of inhalations, of preparations never to be realized, can seem ironic and deflating. Knowing and being able to control the qualities of a preparatory stroke but having no control over the qualities of its realization evokes Heisenberg and his theory on the limits of precision when applied to pairs of variables – the so-called principle of uncertainty. We have to get used to the idea of being able to control one without controlling the other and, even beyond that, we must embrace the idea that the more firmly one controls a given variable the less control one has over its corollary partner.

Since we have established that expression resides in the upward movement, culminating at the brief moment of stillness before the downward stroke begins, it makes sense to practice the upstroke and not the downstroke. The mechanics of lift, speed, acceleration, as well as the qualities of the pivot point at the top of the stroke are remarkably similar between conducting and percussion playing. I have spent a lifetime amassing a catalogue of percussion upstrokes. With conducting, my taxonomy is still under construction. Remarkably, the questions are nearly identical. Do

you move in a single fluid stroke, or do you break the upward stroke into subdivisions? Is there acceleration in the upward stroke? How long and with what quality of weightlessness does one pause at the top? In other words, what precisely is your relationship with gravity as you raise your hand? The answers to these questions differentiate resonant drums strokes and lyrical conductorly moments from sharply articulated cymbal rhythms or the sense of *scherzo* in a Beethoven symphony. Sometimes, the preparatory stroke is not on the vertical axis. Imagine playing a hanging gong, or starting on beat three after a fermata. Nevertheless, gravity must be imagined, and the sense of resisting it imposed even when it is absent.

In both conducting and percussion, the gestural plane of movement away from and toward your own body activates another set of mechanical and expressive possibilities. In a “multiple percussion setup” (one in which several instruments are arranged as a larger “meta-instrument”), a move closer to the instruments invites greater manipulation of sounds. When you are close enough to touch the instruments you can mute, dampen, or otherwise modify their sounds. A move away from the instruments – necessitated when a setup is very large and a player leans away from some instruments to play others – results in breaking contact with the setup. Here, a shift of the center of gravity of a player produces changes in sound quality. In the case of conducting, moving forward and back does similar things. Leaning forward can strengthen contact with a given section of the orchestra, but necessarily at the expense of another group whom you are leaning away from. Shifting back on the podium offers the chance to embrace the entirety of the ensemble, but at the expense of a slightly destabilized center of gravity. An error I made repeatedly in my first concerts was to lean forward toward the orchestra at moments when I wanted to take control or excite passion. I thought that if I could just reach out far enough to touch the performers I could incite them to greater heights. But as in nearly every social encounter, moving into someone else’s space has the effect of making that person lean back. In the case of an orchestra, this makes for less not more intense playing. In recent years, I have gotten much better results from giving a cue to raise the emotional energy of a passage and then letting the orchestra come to me. In some cases, barely moving at all brings out the most impassioned playing. This is the same way a relaxed and powerful stroke on a bass drum or tam-tam produces more sound than one that is tense and overcontrolled.

Classical percussionists and conductors also have this in common: neither actually touches an instrument that produces sound. Of course non-Western percussion traditions are replete with hand-drummers, gamelan performers, and *congeros*: musicians who hold, cradle, mute, or otherwise touch their instruments. But as a contemporary classical percussionist, I

nearly always use sticks, mallets, brushes, or bows as physical intermediaries. I don't touch the instruments; I touch something that touches the instruments. Therefore, the percussionist spends his or her life in a deeply problematized relationship with "the instrument." Since we don't hold or touch them, we only hear them through our ears. Most other instrumentalists hear their instruments through both their ears and via direct contact with bones and muscles. (I can only imagine what a clarinetist, violinist, or a singer feels and hears while performing.) Add to this that we often play on unfamiliar instruments. (I know some percussionists who always travel with personal instruments. However, at least for me, in a country as large as the United States, it's a rare concert on tour when I am not playing borrowed or rented instruments.) We hold our instruments – literally and metaphorically – at a distance. But, with distance, we gain independence from the control exerted by a "governing object." With distance we gain freedom.

To unpack this, let's start with the idea that musical gesture is always in response to an object (even if this object is the larynx). The shape and use of an object govern the gestures required to activate it. But every object will control the gestures it prompts to a different degree. For example, in the extra-musical world, the very particular shape and function of a golf club means that to a considerable extent this object controls the gestures employed in its usage. Anyone picking up a golf club for the purposes of playing golf will move very much like anyone else who does the same thing. A flat plate of metal, however, exerts far less control over its functionality and therefore the gestures engaged in its activation. You can eat off a metal plate, skip it across a still pond, play it with a triangle beater, or prop open a door. All of these are legitimate uses of a metal plate, and as a result produce a great variety of possible gestures. Now let's substitute the governing object, replacing golf club with "cello" or "xylophone," and you see that the amount of gestural variety elicited is, likewise, limited and highly determined. Using a cello requires cello-like gestures; a xylophone, xylophone-like gestures. But the percussion world is full of objects just like a metal plate (in fact, it is full of metal plates) that evoke a varied and largely undetermined vocabulary of gestures. Consider also that a percussionist does not engage just one object, but in fact many hundreds, and you can begin to see the extraordinary diversity (and therefore, liberty) of gesture involved in the performance of percussion.

The conductor extends this argument further. Since a conductor neither touches an instrument nor makes any sound while conducting, the gestural world is even less controlled by a "governing object," and therefore even more free and varied. In addition to the rudimentary

gestures of beat patterns, a conductor's primary job is to give preparatory gestures that are readable to a diverse group of instrumentalists. An upbeat has to prompt simultaneous mechanisms of preparation from piccolo players to tubaists; from violinists to contrabass players; bassoonists to woodblock players. Since a single gesture triggers a dozen or more unique gestures of performance, the gestural mechanics of conducting cannot be too strongly attuned to any single instrument. A truly violin-oriented upbeat wouldn't work with a large wind instrument and might cause a trombonist, for example, to enter late. Likewise, the immediacy of attack with percussion is very unlike the relatively slow onset of a low string. A conductor must make a gesture that is legible to each. The solution is to use a nonmimetic gestural language, one that resembles only itself. In other words, the upbeat to a unison entry by winds and strings should not itself look like an inhalation or up-bow stroke. The conductor relies on the minds of the players to translate the general, nonmimetic gesture of an upbeat to the intake of breath or the lifting of a bow arm. In short, if a conducting gesture is nonrepresentational and therefore does not *mean* anything, its functionality is extrinsic, not intrinsic. Gestural meaning must be assigned. It must be learned. This is a premise any conductor realizes when working with performers who have not learned the system of gestural cueing. Try to conduct a noninstrumentalist – an electronics operator or audience member or amateur percussionist. It doesn't work. Even if you show a very clear upbeat, such a person is likely to play at the first sign of movement and will, almost always, be early.

## **Conducting is teaching**

It is the communal and mutually reinforcing acts of teaching and learning – not the lofty goal of interpretation, not the questionable goal of being a *maestro*, nor the venal one of control and power over a group – that is the conductor's most important task. It's simple: conducting is teaching. Your job is to learn the score and teach it to people who do not know it. This very basic realization allowed me to return to a paradigm of teaching and learning that I had honed over decades as a percussionist and percussion teacher and apply it to conducting. The process of intake, refinement, and testing that I use in learning percussion music is the same one by which one can master anything from a symphony of Beethoven to tying a double-Windsor knot or making the perfect peach cobbler. The process is therefore not specific to the task at hand and should work with nearly anything.

Take an initial amount of material – roughly what you can digest in fifteen minutes or so. We'll call this a chunk. The chunk must be small

enough to be learned *in toto* (if you have to subdivide the chunk into subsections then that is the size of the chunk), but large enough to be meaningful. Then “embody” the chunk, that is to say transfer the information to yourself in the form of a physical skill (in the case of learning a percussion piece) or an ability to view and fully imagine a section of a piece (in the case of conducting). Inevitably, there will be flaws as you transfer the skills to your body. Repeat those areas of weakness, practicing to make them stronger. Then test them to make sure that the chunk has been learned intact and accurately. Go on to the next chunk and repeat the process. You will need to return to previously learned chunks regularly to keep them from decaying.

I love the beautiful tedium of this kind of work. For me, the slow construction of the mental/physical architecture creates the internal scaffolding that is a necessary counterbalance to the emotionally destabilizing act of performance. In fact, reconnecting with the deeply meditative process of learning was the most valuable thing conducting has done for me. In the first two years of my tenure with the La Jolla Symphony, I awoke most nights with a deep fear that I was incapable of delivering as a conductor on a level anywhere near that which I had attained as a percussionist. In part, the fears were social. Will my friends and colleagues be disappointed in me? Or worse, will they think I am foolish? The fears were also personal. By taking on a new and challenging occupation in my late middle age, I sought to avoid the pitfall of simply reproducing the acquired expertise of percussion playing. That was very positive. But was I dedicating an enormous part of my available energy, in what was arguably the last big creative phase of my life, to a quixotic and potentially unwise goal? Who cares what anyone else thinks: do I think I am being foolish? I’ll leave these questions unanswered for the moment.

The process of learning might be remarkably similar across disciplines, but the way it manifests itself in any given discipline is unique. With conducting, the teaching/learning continuum coalesces around several issues: (1) gestures and their nuances, leveraged to produce an interpretation; (2) the score and corresponding questions of authenticity; and (3) cultivating collective wisdom in an orchestra; in other words, harnessing interpretative energy that supersedes the will of any individual. We have spent some time with the issue of gesture, though of course much more could be said. The latter two points are connected to each other and to one of the principal axes of contention in contemporary music since World War II: authorial supremacy.

It is not my intention here, nor is it within my expertise, to address issues surrounding the inviolability of the score or questions about interpretive indulgence on the part of this conductor or that one. There have

been plentiful occasions to react to Gunther Schuller's jeremiad, "The Compleat Conductor," or on the other side of the divide to extoll a particularly brilliant and personal interpretation by, say, Leonard Bernstein. I am not interested in this because the question itself is flawed. "Shall a conductor honor the score in all of its detail?" Such a question is rooted in the belief that a musical score is in fact an adequate representation of a composer's wishes. Whether one ultimately argues for a "pure and unadulterated" version, as Schuller would, or sees the score as a malleable means to an end, as Bernstein or even Mahler might, there is basic agreement on the question of the "firmness" of the score. Both sides acknowledge that a score exists and that the principal interpretative question rests in how one uses it. Very Old Testament.

Such a point of view makes no sense to this contemporary percussionist, who understands how limited a tool a score really is. I am thinking of a short cymbal phrase in Helmut Lachenmann's wonderful solo work *Intérieur*, though I could have chosen a hundred other examples in any of a dozen pieces. The passage involves a rolled crescendo on a large suspended cymbal from *pianissimo* to *mezzo forte*. It should take about one second to execute. This would seem to be a very straightforward indication. A realization of this single event could be analyzed along the same axis as the long-standing arguments about conducting interpretations: Should one execute it as indicated or change it for the purposes of personal expression? But a closer examination reveals that the score is not at all clear and firm. For starters, what is a large cymbal? Should it be a Turkish cymbal of modern construction (light and bright in the harmonic spectrum) or should it be darker with a more robust fundamental? And what if, because of the thickness of the metal or the way it is hammered, a smaller cymbal makes a deeper sound? Should a percussionist use the bigger cymbal anyway because of the indication "large?" And what about the fact that the crescendo to *mezzo forte* is designed to create an envelope of sound in which several small sounds that follow can resonate in an acoustical bed of the cymbal sound? Isn't *mezzo forte* then less an indication of dynamic volume and more of sustaining power or even harmonic richness? And what of those small elements that follow, the triangle and cowbell notes? If their brightness is to match the cymbal then perhaps a crescendo beyond *mezzo forte* to *forte* is in order since this will activate the upper partials of the cymbal and provide a matching harmonic spectrum. The result might be a sense of kinship between the *sostenuto* and articulate elements in the passage. Or perhaps, if *mezzo forte* is the right dynamic, a change in the basic tempo of the phrase needs to be made so that the sonic structure retains its integrity. Ah, which to choose? The correct sound, the correct dynamic, or the correct tempo? And we have not even begun to talk

about how a given sonic solution might respond in varying acoustical environments or with different mallets. And all of this ambiguity comes from the very simple indication of large suspended cymbal at *mezzo forte*.

As a result of hundreds if not thousands of similar situations in the contemporary percussion repertoire, I have stopped looking at a musical score as a compendium of answers, but rather as a map of musical relationships, what I think of as a “weather system.” Perhaps, an interpreter becomes a kind of meteorologist, in which linked relationships in the musical weather system are explored. Such an understanding refutes the view of the score as the truth inscribed on sacred tablets. In a musical score, everything is important, but nothing is sacred. Conversely, nothing is insular; everything is interconnected. Changing the marked tempo at the beginning of Iannis Xenakis’ *Rebonds* is intrinsically neither a good nor a bad move. But it will have profound effects on the way the forces of rhythmic and textural evolution are metabolized over the course of the composition. Likewise, changing mallets frequently in Karlheinz Stockhausen’s *Zyklus* is neither good nor bad, unless an interpreter is unaware of what such a strategy may do to the linked questions of tempo and pacing.

This was the mindset that I brought to learning and conducting the classical repertoire for orchestra. Early in my conducting life, another conductor asked me whether or not I preferred to intone the upbeat or the downbeat in a passage at the beginning of Brahms’ *Second Symphony*. I didn’t have an opinion and was immediately stricken with a nauseating wave of self-criticism. How could I not know the answer to such a seemingly basic question? I looked to the score, sure that the answer was there. It was not. The score does not tell you how to answer this question, or another Brahmsian question about whether or not to shorten the notes at the ends of phrases, or a myriad of other concerns. The score, however, is the tool to evaluate the chain of significance that will ensue by choosing one option over another. Eventually, I decided not to place much emphasis on the downbeats at the beginning of Brahms #2, not because the voice of Brahms spoke to me through the score, but because the metric ambiguity that naturally ensued was a valuable tool to have as the piece progressed. By withholding the answer to the most basic metric question, “where’s the downbeat?” in the early stages of the piece, the greater metrical firmness of the later music, culminating in an ultimate and incontrovertible assertion in the fourth movement, had greater power. When the score is a weather system, making a decision opens up possibilities in one direction and closes them off in another. Therefore, an interpretation is not only a set of correct choices, a catalogue of affirmative actions. It is also a compendium of loss, a listing of those many viable pathways that were not taken. The enemy of art is not a bad choice; it is the certainty that one has found the correct one.

Suspending the quest for authority means inevitably that there will be multiple authors. I marvel at the catalytic moment in a rehearsal cycle when the orchestra suddenly and collectively simply knows what to do. It is as though wisdom – nearly always the province of an individual – is suddenly transferred to a group. The collective ownership of musical authority is that moment when 40, 80, or 300 people suddenly hear a phrase in the same way, or manage an awkward tempo change in unison, or lift before a final fermata. No rehearsal cycle is long enough to perfect these moments via conductorly control – and recordings that purport highly defined interpretations often sound sterile as a result – so the sudden untutored appearance of a communal thought is a small gift. The collective intelligence of the orchestra, the group impulse that supersedes the will of any individual, is the rejection of the academic, the insular, and the dispassionate in favor of the real, the communal.

After that poetic sentiment, it's a good time for something more commonplace: a disclaimer. Even after conducting nearly 250 pieces, including almost all of the Beethoven Symphonies, the *Missa Solemnis*, Benjamin Britten's *War Requiem*, much of Mahler and Brahms, and large swaths of several contemporary composers including James Dillon, Pierre Boulez, Iannis Xenakis, and Edgard Varèse, I state with certainty (and even a little pride) that I am still a novice conductor. And to the extent that being a novice means retaining a beginner's mind, I hope I will always be a novice. My goal with these words is not to stake a claim as a professional conductor, but to aerate my thoughts on a practice that has become an important part of my life. In fact, staking a professional claim seems like a small and sad thing for an aging novice to do. The goal in conducting is the same as it has always been in percussion playing: to find a meaningful problem, and through miniscule steps toward mastery, occasionally find yourself in a state of grace through sound. Doubtless this is an overly grand formulation, but I wager that every practicing musician knows what I mean.

These moments of grace feel different to me as a conductor than they do as a percussionist. As a percussionist, there is a bodily sense that is marked, again and again, by the sweet kink of contact with an instrument. It is simultaneously a dance and, because of the physical realities of the instruments, a kind of practice. For me, at its best it feels like yoga. But everyone will have his or her own simile. The act of conducting, however, is less animal, less the surmounting of corporeal obstacles since there are none, and more a solitary act of exhortation to those who are doing the surmounting. Yet at times, the two roles feel remarkably similar. What they have in common – these two people, the expert percussionist and the novice conductor – is the need to look outside of himself/herself for sense, to retrain the inward gaze outward as a way of connecting to the

lives and thoughts of others. The expert percussionist and the novice conductor both rely on a language of gestures and the uncommon emotional freight involved in moving in order to be moved. Finally, both the expert percussionist and the novice conductor are pilgrims in a land of new noises; the goal for each is to find the right noise for the moment. And in the end there is the realization – this is so lovely – that expert and novice are not so very far apart.



PART FOUR

## **Composing music for percussion instruments**



## 11 Finding a voice

BOB BECKER

In his 1994 article *Composer or arranger: Is there a difference?*,<sup>1</sup> the distinguished Canadian composer Bruce Mather asked a loaded question: “What is composition?” In the article, he expressed dismay that many composers appeared to be rewriting music of the past. Mather wrote provocatively of “musical amnesia” to describe what he viewed as an aesthetic crisis: “The work of [certain contemporary composers] might be more worthy of esteem only if Bartók, Hindemith, Schoenberg and Stravinsky had never existed.” He went on to analyze what he felt distinguishes composers and arrangers: “the distinction between composer and arranger is not exactly one of originality. Composers who develop a very personal language . . . are very rare. The distinction has more to do with the qualities of invention, the distinctiveness of materials, and the freshness of expression.” I recall a comment by the late Japanese composer Toru Takemitsu that, at a given moment, any country in the world can have at most only one composer with a distinctive voice.

In relation to modern percussion music, we could update Mather’s list of esteem-worthy composers to include names such as Cage, Partch, and Reich. John Cage, even late in his life, described himself as a “percussion composer,” an expression that differs from “percussionist-composer” by more than a hyphen. Cage, at least early in his career, was forced to be a composer-percussionist. Although he had no formal technical training, he and a few similarly handicapped colleagues were obliged to play the instruments in his early percussion works simply out of necessity – there were no professional percussion ensembles in existence during the 1940s. Harry Partch became an accomplished performer on his own percussion instruments because, in order to realize music in a 43-tone-to-the-octave system, he was compelled to design and construct them all himself. At first, no one else could play a Diamond Marimba or Quadrangularis Reversum. Partch explained, “I am not an instrument-builder, but a philosophic music-man seduced into carpentry.”<sup>2</sup> Steve Reich has stated, “I first decided that despite my limitations as a performer I had to play in all my compositions. It seemed clear that a healthy musical situation would only result when the functions of composer and performer were united.”<sup>3</sup>

What exactly is the “function” of a composer, and can it, in fact, be united or combined in some way with that of a performer? When asked to

differentiate between composers and performers, I often draw an analogy with explorers and adventurers. A composer is an explorer – someone who goes off alone to remote, difficult, sometimes dangerous places, and takes risks to bring back something new and amazing to show everyone back home. One doesn't set out on expeditions like this without the proper training and equipment, and, for any genuine explorer, the objective is the discovery of unknown territory. A performer is more of an adventurer or tour guide – someone who scouts the terrain, gets all of the necessary gear organized, and then leads a party of people through exciting and spectacular scenery. The aim for everyone, including the guide, is to witness something extraordinary.

In more concrete terms, a composer's function is to create an account of his or her own imagination in a comprehensible form – that is, in an explicit notation or medium. It is a straightforward undertaking to learn and develop the skills necessary to notate musical sounds and rhythms accurately; however, it is a serious challenge to discover a unique method for encoding the abstraction of a subjective mental landscape. I think Mather means to apply the term “arranger” to composers who can't resist the seductive pull of a preexisting successful musical language, and “musical amnesia” is a kind of blindness to the entire proceeding. A great film composer like John Williams is an arranger by this definition, but surely one whose appropriation of musical styles is done with complete intention. In his article, Mather is rather less forgiving in selecting his list of contemporary arrangers. Stravinsky's famous quip, “lesser artists borrow; great artists steal,”<sup>4</sup> points to a line between referencing the past by actually developing and expanding on older forms and techniques in an original way and simply adopting a style – between deconstruction and reconstruction, between assimilation and appropriation. This line can be fuzzy, but anyone who wants to write music needs to choose a place to stand. Stravinsky himself seemed to find a unique position, straddling the line and planting one foot on either side.

The two roles – explorer and adventurer – certainly can overlap, and it's not difficult to imagine situations where the functions of composer and performer intersect. One obvious arena is improvisation, which may be viewed as a kind of spontaneous composition. A number of well-known percussionist-composers have remarked that they always begin, and often complete, a composition by extemporaneously playing on the instrument(s) chosen for the orchestration. Those who specialize in writing for solo marimba are particularly prone to this approach, and improvisation based on technical patterns is often the primary method for finding and developing the material used in a piece. On the positive side, an accomplished performer working in this way can produce

characteristic and technically assured music – much in the manner of pianist-composers like Carl Czerny, however, rarely with the authority of composer-pianists such as Rachmaninoff or Chopin.

The piano and its solo repertoire occupy a privileged position in Western classical music, and the marimba currently aspires to a similarly special place in percussion music. During the last two decades of the twentieth century, the marimba began to compete with (and displace) the snare drum as the fundamental source for technical training and conceptual development in percussion performance and pedagogy, particularly at North American universities. The 1970s saw the introduction and refinement of radically new approaches to marimba technique, along with renewed efforts to expand the range and enhance the quality of the instrument itself. Comprehensive training methods, complete with extensive progressive exercises and countless etudes, currently offer percussion teachers an instant syllabus. As a result, the marimba is beginning to take its place in college curricula as an instrument of serious specialization, and degrees with a marimba major not connected with the general percussion studio are already available from some institutions in the United States and Japan.

During the past forty years, percussionist-composers created a tremendous amount of repertoire for themselves and their colleagues through appropriating techniques developed by prominent composers and incorporating musical approaches popularized by jazz and “world” artists. It was an understandable, if less than inspiring, response to the near void of serious solo and ensemble music composed for percussion instruments during the twenty-eight years between Cage’s *Third Construction* (1943) and Reich’s *Drumming* (1971), a period Steven Schick refers to as “the big chill,”<sup>5</sup> Carter<sup>6</sup> and Wuorinen<sup>7</sup> notwithstanding. Although marimba repertoire does include some important music from this era by composers such as Creston,<sup>8</sup> Kurka,<sup>9</sup> Miki,<sup>10</sup> Miyoshi,<sup>11</sup> and Tanaka,<sup>12</sup> marimbists found themselves staring into a similar vacuum. The response by two virtuosos on opposite sides of the globe – Leigh Howard Stevens and Keiko Abe – was to push for the creation of new and original solo works by major composers. Their efforts during the 1970s resulted in a critical body of new music for the instrument, but consequently one that has almost drowned in a sea of imitative and nearly indistinguishable pieces written by marimbist-composers around the world.<sup>13</sup>

It is interesting to consider whether the endeavor of studying and playing percussion instruments, including the marimba, creates some sort of pressure to compose, as in Mather’s “distinctiveness of materials.” Is there a compositional imperative to be found in the great variety of styles and techniques that need to be assimilated by a contemporary

percussionist? The current inclusion of multiple disciplines in percussion training – orchestral, baroque (via the marimba), modern avant-garde classical, theater, jazz, military (marching lines/drum corps), and “ethnic” (everything else in the world) – may have led to an embarrassment of riches. The already extensive demands made on students will continue to proliferate as changes in the professional music environment accelerate, and a glance through any recent orchestration book confirms how difficult it can be for composers to keep up. Lacking suitable repertoire, it is a natural reaction for percussionists to attempt to incorporate all of their instruments and technical abilities into music they write for themselves. Unfortunately, an abundance of percussive skill does not ensure the ability to approach the rigors of creating a compositional voice of any originality or significance, at least not of the variety suggested in Mather’s article.

Finding a conceptual basis for writing music, and then developing and honing it, is a gamble. There is no guarantee that a seminal idea will pay dividends in either the short or long term until it is tried and explored. My experience in this regard was a bit like winning a lottery because at first I was unable to judge the longevity of the basic methodology I elected to use in my work. A composer is the traveler in the folk paradox, “How can you choose a road to someplace when you don’t know where you are going?” On the other hand, the corollary, “If you don’t know where a road leads, it definitely will take you there,” may not necessarily hold up. For composers, there are a lot of very short roads with abrupt endings. Still, not knowing where the road leads is the great adventure of composition, and the dialectic resolution “wherever you go, there you are” is undeniable.

For me, discovering my own compositional language felt something like a revelation, but it was nonetheless the result of a cumulative life experience. My earliest childhood encounters with music involved an intense emotional response to harmony. I can remember the physical feeling in my stomach and an awareness of “mood” for the first time. I responded to melody and rhythm too, but those aspects of music felt somehow more tangible. I could recreate them silently in my imagination, or audibly by humming or tapping. Harmony, on the other hand, has remained throughout my life something mysterious in its power to affect me. Studying music theory during high school and college neither changed nor illuminated the impact harmonic progressions produced or the feelings they could evoke.

Somewhat later in my life I encountered Hindustani music and had the opportunity first to study, and then practice and perform it, over a period of more than twenty years. As is well known, classical Indian music reaches astonishing levels of rhythmic and melodic sophistication, but has no functional harmony (as associated with Western tonal music) whatsoever.

Vertical pitch relationships only occur in the interval ratios between individual melodic tones and the ubiquitous drone heard throughout any performance. Although Indian modal scales, or *ragas*, are conceived to have a primary note (called *vadi*) and a secondary note (called *samvadi*), they do not contain dominant and subdominant tones as found in traditional Western scales and modes. The *vadi* and *samvadi* can be any two notes, depending on the particular *raga*'s construction. Indeed, a *raga* may contain as few as five scale degrees, and there may be no interval of a fifth in the mode at all. The exquisitely ornamented and melismatic melodic phrases of Indian music imply no harmonic direction and hold no cadential tension to be resolved by real or implied triadic progression. That is the view among Indian musicians and Indian audiences; however, my experience was quite different.

For someone born and raised in a culture saturated with music based on chord progressions, it is probably inevitable that the mind will supply imagined harmonies when hearing monophonic or heterophonic melodies; yet, in the context of listening within a new and exotic musical atmosphere it was an unexpected subliminal perception for me. The results were not unpleasant, and on occasion I was surprised by the particular harmony my mind proposed, apparently without any specific intent from my conscious awareness. Even so, it was a while before I understood how the process occurring inside my own mind could form a foundation for just the personal language I needed in my composition work.

Modern Hindustani music theory catalogues upwards of 100 distinct *ragas*, of which several dozen are currently in vogue. I found the modes with relatively few tones presented the most ambiguous harmonic implications, and some – for example, the pentatonic *chandrakauns* and *malkauns* – evoked particularly intriguing sensations. The scale of *rag chandrakauns* (which has traditional associations with the full moon and late night hours) happens to have no fifth degree: tonic, minor third, perfect fourth, minor sixth, major seventh. Working with these intervals immediately resulted in sonorities that sounded new to me, but it wasn't until I applied more complex procedures to the material that I began to understand its potential. I was able to derive some surprisingly elaborate structures, including the matrix of four nine-tone scales currently employed in my music. Finally, I determined a set of principles that gives a comprehensive, consistent, and personal methodology for handling both melodic and harmonic construction. While these conditions allow for some flexibility, they make definite constraints on what pitches may be used simultaneously at any point in the music. Composing in this systematic way, every note is *accounted for* horizontally, and all vertical relationships are *accountable* to the established rules. I can say I created the system, or that I discovered it, but more properly

it grew out of my personal musical trajectory: thoughts and feelings I experienced while listening to sounds; practical training I received on musical instruments; instruction I was given in analyzing and understanding musical form and structure; and probably most important for me, the impact of performing together with other musicians in a variety of stylistic and cultural contexts. A kind of psychological cross-referencing always seems to occur when one strong cultural expression encounters another. Twenty years ago, I wrote that, in my opinion, this perceptual phenomenon would be the defining issue for all of the arts and politics in the twenty-first century.<sup>14</sup> Today I feel even more convinced about it.

At this stage in my life I'm certain I am no longer "arranging," but a question remains: Am I a percussionist-composer or a composer-percussionist? Although I still may be in transition from the former, the principles and rules I need to function as the latter are firmly in place in my work. They arose from the exploration of a personal cognitive insight – informed by my own background and studies, and situated at a specific historical and technological moment. I have been told that in order to be successful, a composer needs to be prolific. By that rule, I will never succeed as a professional composer. However, I measure my success in this avocation not by quantity or variety, and not by financial gain or public approbation, but primarily by my own experience of discovery and growth, and secondarily by whether I feel the work has continuity and *significance*. For me, the measure of significance is not concerned with judging the relative "greatness" (however that may be defined) of musical works. It has far more to do with satisfying Mather's demand for a "personal language," and is what really differentiates the categories of arranger and composer, percussively modified or not. At least by this qualification, I can view my work as having some significance, both in a general musical sense and in relation to the continuum of the development of percussion repertoire. If percussionists recognize me to be a composer, and composers consider me to be a percussionist, perhaps that is the best of both worlds.

### Notes

1. B. Mather, "Composer or arranger: Is there a difference?" *Sound Notes* (Spring/Summer 1994).
2. H. Partch, "Photographs of Instruments Built by Harry Partch and Heard in His Recorded Music," LP record insert (CA: Gate 5 Records, 1962).
3. S. Reich, *Writings on Music, 1965–2000* (Oxford University Press, 2002), p. 78.
4. Although this remark, or something very similar, is also attributed to others from Pablo Picasso to Steve Jobs, its implications regarding imitation would be difficult to express more succinctly.
5. S. Schick, *The Percussionist's Art* (University of Rochester Press, 2006), p. 65.
6. The first six of Elliott Carter's *Eight Pieces for Four Timpani* were composed in 1950, and the final two in 1966.

7. C. Wuorinen's *Janissary Music* (for solo percussionist) was published in 1966.
8. P. Creston's *Concertino for Marimba* was published in 1940.
9. R. Kurka's *Concerto for Marimba and Orchestra* was published in 1956.
10. M. Miki's *Time for Marimba* was composed circa 1968, and his *Concerto* (for marimba and orchestra) in 1969.
11. A. Miyoshi's *Conversation* (Suite for marimba) was composed circa 1962.
12. T. Tanaka's *Two Movements for Marimba* was composed in 1965.
13. A significant exception is Gordon Stout who, almost from the beginning of his composition work in 1973 with *Etudes for Marimba* and *Diptych No. 1*, established a distinctive approach to writing for the instrument. Even now, it is difficult to know whether to describe him as a marimbist-composer or composer-marimbist.
14. Program notes for *The Bob Becker Ensemble*, 1994.

## 12 Flexibility as a defining factor

JASON TREUTING

I consider myself a performer/composer because I feel that my approach as a performer has heavily influenced the way I write music and the basic principles I value as a composer. When I perform music by other composers, I want to believe I am a needed component in the process, not merely a cog in the machine. I want to know there is room for my thoughts about the music.

Many times I have this experience because the music I perform is written specifically for me. When this happens, I work closely in collaboration with the composer so I can feel how my unique skill set and overall commitment impact the process and the outcome. Sometimes I perform music by composers I have never met, usually because the music was written before I was alive. In these cases, I am drawn to a piece because I feel a shared aesthetic approach with the composer and because something in the music convinces me that my contribution is valuable. Maybe there is a skill I have that not every classically trained percussionist has, and that would add something to the music; or maybe there is something about the rhythmic sensibility of the music that I can put my stamp on. Many times, it is just something ingrained in the piece itself, a flexibility that gives each performer room for choices which will substantially alter the way the piece sounds. Morton Feldman's *King of Denmark*, John Cage's *Third Construction* and Iannis Xenakis' *Psappha* are all examples of works I am drawn to for these reasons, and the approach each composer took has affected the way I compose.

Here's another way I have begun to look at this. As a member of the quartet Sō Percussion, I have the chance to travel around the world and talk with students and interested audience members about what we do. If someone knows I play in a percussion quartet, but has never heard us, I ask them to close their eyes and imagine what the stage will look like for our show. This is a wonderful exercise because it touches on one of the most basic qualities of our field. The Western classical percussion ensemble lineage is still in its infancy and that makes it a very open place to explore – there is no objective standard. If you close your eyes and picture a Western classical string quartet, inevitably you are thinking of two violins, a viola, and a cello. If you picture a percussion quartet, one person might see keyboard instruments on one side of the stage and drums filling the other.

Another will think of the “found” sound traditions of John Cage, Lou Harrison, and others. Some will think of drum sets and vibraphones and others will imagine orchestral instruments. There might be no instruments on stage at all and the audience could still enjoy a percussion quartet performance when the performers clap, slap, or rub their bodies, or use drumsticks on the floor.

In many ways, one might think that when writing for percussion, the composer’s most basic decision would be to choose which instruments will be used for the piece. But still, many influential composers of the twentieth and twenty-first centuries allow the performers a great deal of leeway to decide what their music will sound like by allowing them to choose their instruments. Categories like skin, wood, and metal can be used as guiding principles, or an instruction like “five tin cans” will lead the performer in a direction with some specificity but allow for much variation within that. When the melodies of a piece are performed on five tin cans of the player’s choosing, that player has great influence on the result. As a composer, I find this incredibly inspiring: those other composers must have had great confidence in the underlying structure of their music. As a performer, I find it rewarding to be able to make choices that will profoundly affect the way a listener hears a piece.

Composers can do this in other ways, too; for example, sometimes the performer is involved in the way the piece unfolds over time. Compositions like Terry Riley’s *In C* or Steve Reich’s *Drumming* allow performers to choose how long each event happens. Other composers write pieces for flexible instrumentation. An example of this is Louis Andriessen’s *Workers Union*, written for any number of players. Andriessen writes specific rhythms to be performed in unison, but the pitched material is left open to the performers by asking them to follow the contour of the melodic line. Both of these approaches allow for a wonderful compromise of control between the composer and the performers.

I don’t think all music needs to be made like this, and I don’t write music like this all of the time. But the approaches outlined above have inspired me in a core way as a composer. They have made me a performer/composer. The first music I wrote was twelve pieces set to short videos called *amid the noise*. I wrote many of the pieces for myself and recorded them in layers. Later, they developed into pieces for Sō Percussion (the quartet I play in and write the bulk of my compositions for). Since the pieces were written for me and my musical family, the notation stayed in skeletal form for a long time. It was many years before any of the pieces were written down in a way that others could understand, and each piece was only codified in this way when another group offered to perform it. This process of composition to notation spanned ten years in some cases,

and that distance allowed me time to really think about how I wanted this communication to play out. What information did I need to pass on to the performers to ensure that the performances would represent my thoughts and, on the other hand, what information could I leave open to the performers?

The result is different for each of the twelve pieces that makes up the set. Sometimes I used notation that could be considered standard in the Western classical music sense, but more often I created bits of notation that use a staff and note-heads along with explanations in paragraph form and instructions on how to build the pieces from the ground up. My thought was, and continues to be, that if the performers learn the methods behind these structures, they will be able to convey them through their own interpretive lenses in a stronger way. The process has two ramifications: it is more time consuming to learn yet lends itself to unique interpretation. This is a trade-off I am happy with.

Let me give you a bit of background on these pieces. As I mentioned above, this set of music was written to be performed with video. A few of the pieces were originally part of a film score for *Invitations and Ultimatums*, a documentary film that my sister, Jenise Treuting, made. I wrote the music along with another composer, and we decided to try to find a method to make sure our contributions would fit together. I told him I had been experimenting with compositions that translated text into music using patterns found in the text. For example, I would create large structures using the series of numbers derived from the lengths of the words in the quotation. I would often use smaller patterns to structure a rhythmic layer, like taking alternating vowels and consonants and translating them to rhythmic patterns. We settled on a quote of Martin Luther King, Jr.'s that made sense with the subject of the film and, through experimentation, found ways to work together with this method.

For one example with a bit more depth, let's look at *June* from *amid the noise*. As with most of the works in this set, *June* was conceived in three core layers: drone, harmony, and noise/rhythm. Some of the other pieces in the set add a fourth melody layer as well. In this case, the drone is a C that continues throughout. For the harmony layer, there are six possible chords for the performer to choose from, and the order and how they move is largely up to the performer. The timing of these chords is prescribed, at least relatively. The length of the words in the Martin Luther King text guides the duration of each chord. The noise/rhythm layer is derived from the order of consonants and vowels in each word – this layer is the most flexible. Sō Percussion recorded this layer as fluttery hi-hats, but many other possibilities exist for each interpretation: sometimes more ambient

Example 12.1 Score to *June*.

**june**

***Our scientific power has outrun our spiritual power;  
We have guided missiles and misguided men. -MLK, Jr.***

Instrumentation: Rhythmic noise element; sustaining chord element; optional ambient or chance noise element; drone.

Harmony/Melody: Sustaining instrument performs the chords, using the length of each word in the quote as a guide for length of sustain. Each letter represents 1", so that the first chord will sustain for 3" (our), the second 10" (scientific), etc. The first group of 4 chords must be used exclusively for the first line of text (Our...power). The second group of 2 chords may be mixed in for the second line (We...men). Chords may be chosen freely, **but only the top or bottom voice may change from one to the next, not both.**



Drone: C natural above middle C. It can be smooth or active.

Noise: (optional element) Radio broadcast, ambient noise, crinkling paper, etc.

Rhythm: More than one rhythmic element performs a combination of binary elements without coordinating with each other (for percussionists, R and L hand sequences). Using the quote, vowels = one element (R), consonants = the other (L). A fast enough sequence is preferred so that the parts go in and out of sync, creating a noisy chatter. These sequences loop until the sustaining instrument changes to a new chord. The sustaining instrument and the rhythmic element will follow the form of the quote together.

For a percussionist, the first line of the score might read as follows:

Our scientific power has outrun our spiritual power  
RRL LLRRLRLRLR LRLRL LRL RLLRL RRL LLRLRLRL LRLRL

Form: Proceed through the quote any number of times. Duration of each letter can exceed 1" if desired.

noises are used and sometimes solid rhythms ground it. Example 12.1 is the one-page score to *June*, which separates these elements.

In the end, I determined that with *June*, as with many of these pieces, the composition relies on a core structure that cannot be modified. Most often, this structure relies on harmony (and occasionally melody) and in this way, the approach could be considered traditional. The accompanying

rhythms and noise elements are most often extremely flexible. And, like many of the pieces mentioned earlier, the orchestration is completely flexible.

As I write this down and distill my ideas in written form, I see that my approach seems anything but radical. As a performer, I find that many composers in today's musical climate rely more on specificity than flexibility, often with excellent results. But as a composer, I feel that allowing flexibility in the compositional structure as well as input from the performers can yield unique music-making. I am interested in continuing this exploration as a performer/composer in the vital percussion community in which I am lucky enough to belong.

## 13 Thoughts on percussion and rhythm

STEVE REICH

This chapter is a compilation of the thoughts of Steve Reich on percussion and rhythm taken from interviews with Russell Hartenberger in 2003 and 2012, and revised with additional thoughts by Steve Reich in 2015.

### Early percussion training and influences

My interest in rhythm probably began when I was born in some gene in my body that you and I and a whole lot of other people share, and that people will probably find out about fairly soon. I took piano lessons when I was a kid – John Thompson simplified classics type thing – and it had very little impact on me. I heard what I call middle-class favorites when I was young: Beethoven Fifth, Schubert *Unfinished Symphony*, Overture to *Meistersinger*, Broadway shows, Bing Crosby. I never heard any music before 1750 or any music after Wagner or any jazz until 1950 at the age of 14 – it was a revelation. I had a friend who played me a recording of the *Rite of Spring*; I could not believe such a thing existed! It made an *enormous* impression and the seeds for me becoming a composer were planted that day. Later, that same friend played me a recording of the Bach *Fifth Brandenburg Concerto*. A bit later, through another friend, I heard recordings of Charlie Parker, Miles Davis, and the drummer Kenny Clarke, and this music absolutely grabbed my ear. The friend who played me the jazz records was a pianist with some jazz training. We wanted to start a band and I said, “I’m the drummer.” So I started studying with Roland Kohloff, who in those days was known as “Butch.” It was Butch Kohloff who played all the Gene Krupa solos with glow-in-the-dark sticks at the local movie theater. Of course, at the same time, he was studying with Saul Goodman and eventually took Goodman’s place as timpanist with the New York Philharmonic. For my lessons, Kohloff gave me the Haskell Harr snare drum books, and the *Stick Control* book by George Lawrence Stone. He stressed the *Stick Control* exercises and I found them really interesting. Basically, the book is just continuous eighth-notes while constantly changing the hand alternation. I don’t know why, but I thought “hmm, that’s interesting,” and it stuck in my head. I think that was one of the first things that pointed me in a direction that would really prove relevant later on in my compositions.

[173] At the time, I used to go down to Birdland – I had to sit where they didn’t serve drinks – and I remember seeing my idol, Kenny Clarke. The



Figure 13.1 Steve Reich at Brooklyn Bridge.

reason he was my idol was that he had this almost magical sense of time though he just played ride cymbal and a few kick drum (bass drum in those days) accents. What was magical about him was not his technique but the actual feeling of his playing the time, floating Miles Davis and the whole band on his ride cymbal. This was a unique quality, and I wanted to be like Kenny Clarke – but of course you always end up being yourself.

Max Roach was a much greater technician. He could play more stuff, and did play more stuff, and certainly was an inventive musician. But he never had the feeling of “magic time” or whatever you want to call it, that Kenny Clarke had with this incredible *ting ting-a-ting ting-a-ting* on his ride cymbal. Of course, it might have helped that he was playing with Percy Heath and Horace Silver, which seemed like the ultimate rhythm section to me. But it was that simplicity and the *quality* of him playing ride cymbal. Nobody could play it the way he did.

### Time feel in music

That feeling of time and time sense is getting it “right” which might show up on an oscilloscope as “slightly wrong.” A lot of very good players lack that magic because they are very concentrated on being right. What I’m talking about happens in music in general when you know something so well that you’re not reading it, you’re playing it after a long period of time and it’s sunk into you. I think you have to get to a very high level of

competence, even if it's a little *ting ting-a-ting*. But it has to be an automatic, un-thought-about level, which means lots of rehearsals and performances have to happen before you get there. And then, some people have that quality of magic in their playing and others just don't. Maybe if people put electrodes on their heads and all over their bodies they will find why some people have it and some don't – but you know it when you hear it.

## **African music**

I went to Ghana in 1970. At that time, the reigning musical aesthetic in the new music world was called “live electronics.” Stockhausen was operating with banks of equipment in real time; that means he was in the concert hall twisting dials. John Cage was doing the same thing with David Tudor, making electronic pieces happen in front of an audience by manipulating this, that, and the other thing. I think it was Varèse who said something like “percussion led to electronics.” This was the idea that non-pitched percussion led to the use of noise, and I kept thinking, “It's going to come out the other end; the progression is going to keep on going – electronics will lead back to percussion.”

My trip to Ghana confirmed a number of things for me. First, the idea of phasing that I had before I went to Ghana was not something that the Africans do. And the rhythmic techniques used in African drumming are not what I do, but they are related to what I do. The important thing is that there is a tradition of *rhythmic* counterpoint in Africa (and also in Bali). Second, percussion is the dominant voice in African music, as opposed to the Western orchestra where strings are the dominant voice. So, the message to me was there's a tradition for repeating percussion patterns, you're not all by yourself; go, both in terms of the contrapuntal structure of the music and the instrumentation of the music. This is a solid well-trodden path. There's a past and that means there's a future.

## **African rhythm**

In the Ewe pieces like *Agbadza* or *Atsiagbekor*, the ostinato pattern played on the *gankogui* double iron bell in a twelve-beat cycle is compelling because it is so ambiguous; and it is especially ambiguous when the players get going. They stop playing the low bell, which is struck once per cycle and gives a downbeat to the rhythmic pattern, and they ring out on the high bell

only. It's like a ride cymbal. "Where's one? I don't know." After a while, you don't know. All you know is that the music is powerfully moving forward without a clear downbeat to weigh it down. Everybody talks about twelve-tone music, well twelve is really a magic number rhythmically. The basic ambiguity is whether it's 1 2 3, 1 2 3, 1 2 3, 1 2 3, or 1 2 3 4, 1 2 3 4, 1 2 3 4. It could be twos, it could be sixes, it could be fives and sevens. It divides up and lends itself to subdivision more than any other meter. That's why it's hard to know how to write it out –  $3/2$  equals  $6/4$  equals  $12/8$ , because they are all possibly present.

### Balinese music

Balinese music, which I studied in Seattle and Berkeley in 1973–1974, is much simpler than African music rhythmically; it's basically subdivisions. One person is playing sixteenths, another person is playing eighths, still another is playing quarters, and so on, and one person plays the big gong every sixty-four beats – and that's great. I guess what interested me mostly were these interlocking patterns, the *kotekkan*, where one player plays against another player. This was certainly *not* how I used interlocking patterns. I did the same thing but canonically, with a pattern against itself. And it is different from African music; African drumming is basically the interlocking of *different* patterns. In *kotekkan*, you get something where one person is filling in rests, or overlapping. It's not what I do – it's not *canonic*. Another thing that interested me about Balinese music is how the drummers in the *Semar Pegulingan* control the tempo as *playing conductors*. That definitely influenced me, along with the master drummer *signaling* changing patterns in West African music – hence the idea of the vibraphone in *Music for 18 Musicians*.

### Indian music

I have always admired Indian music, but it's basically a soloist with accompaniment. It's fabulous, but I wasn't much of a soloist. When Ransom Wilson and Richard Stoltzman approached me for solo pieces, instead I gave them *Vermont Counterpoint* and *New York Counterpoint* for multiple flutes or clarinets where they play one part and are in counterpoint with the live or prerecorded others; and that's worked out really well.

## Rhythm in composition

At the beginning, basically my idea was that every change in my music was going to be rhythmic; there weren't going to be any changes of pitch or timbre. But then I wrote *Piano Phase*, which has changes in the lengths of pattern (first a twelve-note phrase, then an eight-note phrase, and finally a four-note phrase), *and* changes of *notes* in each pattern. But clearly the piece really develops primarily through *rhythmic means* in the changing unison canons or phases. *Violin Phase* has only one pattern and one timbre, but introduced resulting patterns – patterns which result from the interlocking of two, three, or four voice unison canons. In *Four Organs*, the notes and timbre stay the same but the durations gradually grow to enormous lengths. After that came the idea of the build-ups in *Drumming*, of substituting beats for rests or rests for beats in a repeating pattern to gradually create or gradually change a repeating pattern. *Drumming* takes one single rhythmic pattern, puts that pattern in constantly shifting unison canons, and then changes the pitches *and* the timbre from tuned drums to marimbas to glockenspiels to all of them together. *Drumming* was the last of the phase pieces and the end of that way of thinking. *Music for 18 Musicians*, for the first time, uses a harmonic ground plan to structure the whole piece, and of course that changed everything. Nevertheless, in the hour-long *Music for 18 Musicians*, the meter stays in that basic  $3/2 = 6/4 = 12/8$ . Finally, in *Tehillim*, for the first time, the text spontaneously suggested constantly changing meters.

Overall, these rhythmic means have become kind of a vocabulary. I'll switch between  $3/2$  movements and constantly changing meter movements in many pieces like *The Desert Music*, *Sextet*, *You Are (Variations)*, *Double Sextet*, *Radio Rewrite*, and others. Most importantly, I've spent a lot more time thinking about organizing the pieces harmonically.

### *Drumming*

When I was a student at Juilliard back around 1959, there was a drummer by the name of Bobby Thomas. We had these lunchtime concerts, and at one of these concerts he played a percussion piece in which he had stand-mounted bongos he played with sticks. I don't remember what he played, but I remember the sticks on the bongos – WOW! So pitched, so loud, so clear! I thought, I'd like to do something like that, then I just completely forgot about it. Then more than ten years later, around 1970, I got the idea of doing *Drumming* with tuned drums and started thinking about how I could do it with bongos, stand-mounted and played with sticks.

As for the origin of the *Drumming* rhythm, I knew the African bell pattern, so it might have been related to that. I remember being on the

phone on speaker and drumming my fingers and it happened. It might have had something to do with the way the hands interlock in *Piano Phase*; I don't remember working it out. I remember working out the notes as it goes along, for sure. But the rhythm itself, I think, was one of those things that just *happened*. The symmetry of it was very attractive, and also the fact that the right hand was so completely divorced rhythmically from the left hand. Therefore, by using the appropriate notes in the right hand it would emerge, as it does, over and over again as a counter-rhythm.

When I was selecting the pitches for the bongos I wanted to make them as low as possible, but I began to realize that, just practically, on the lower drum of the bongos, if you went much lower than G# below middle C it was going to make a flabby drum sound and it wasn't going to stay in tune. So, it was a practical consideration about how deep you can make it and still count on a clear consistent pitch. As you know, bongos are usually tuned hard as a rock. So, with *Drumming*, the lowest note is the G# below middle C. It then came to me quickly that the other notes, A#, B, and C#, would be either G# Dorian, or finally, F# major. And once I established that tuning, then the range of the three-octave student marimbas was fine for the transition from bongos to marimbas. It also meant that the low point in the piece was going to be the bottom bongo, and that maintained itself.

I don't even know exactly when the light bulb went on for the marimbas, except I thought the piece ought to continue and marimba was the obvious choice. When I was playing the marimbas I heard the voices, I hallucinated the voices. Which meant that playing repeating patterns on marimba continuously produced acoustic by-products that sounded like women singing those notes. Soon, I invited Joan La Barbara, Jay Clayton, and Judith Sherman to try and sing and imitate those marimba melodies and it worked perfectly. As the piece grew, it finally required nine players to fill in all the patterns going up to the top of the three marimbas. Then, I realized that what was interesting was removing the lower notes and becoming harmonically more ambiguous by ending up on the upper part of the instrument, and that was the end of the marimba section. I then started thinking, "how high can you go?" And that's when I got the idea, "I might as well take this thing all the way up," – and that meant glockenspiels. Once I had this clarity, then I had the confidence to book the concerts in New York City at the Museum of Modern Art, Brooklyn Academy of Music, and Town Hall.

I began to realize that the key to this piece was *that one rhythmic pattern* which changed *notes* and changed *timbre*. I clearly remember that when I got into the glockenspiel section I realized I was left with these three *timbres*, and I began thinking, "I'm going to have to write a *finale*, an old style Western *finale*. I've got all these instruments in front of me, and I

invited all these people to dinner, and now I've got to serve dinner!" So, at the end it was very much a realization of a particularly Western obligation to put together these ingredients that I had dealt with independently. And I think, in a way, that moving forward from *Drumming* is really the beginning of moving back toward more traditional Western thinking.

The musical material in *Drumming* is so easy that you can pick it up very quickly. When I auditioned people to play in *Drumming*, I would try phasing with them. I could tell right away if they would work out or not. Even to this day, I find with pianists or percussionists who do *Piano Phase* or *Marimba Phase*, if they can perform the gradual phasing, everything else will work out.

We Americans are very pragmatic people. I think that's one of our great strengths as opposed to those interminable theoretical questions others get bogged down with. They think there's something hidden in the music: a coded philosophical message; fate knocking on the door. But, there's nothing hidden! What you hear is what you get. What you hear *is* the story, and that wordless story can be very deep.

Teaching *Drumming* by rote to members of my ensemble was the easiest way to get the music across rather than writing it out. The score came later, but first *ding a ding ding, ding a ding ding*. Then, as a very good player and a sensitive player, since playing the notes wasn't a challenge, you got into the feel of it. Then we would try playing it as a duet in canon. I discuss this a lot with people who ask about musicians in the ensemble and their backgrounds. I'm talking about you and Bob Becker in particular, but it holds for a lot of people in the group, a generation that more or less grew up at the same time. People like you and Bob had the qualifications, went to the right schools, achieved a very high level of excellence in Western percussion, and were ready to go into a major symphony orchestra. You could have had those jobs but chose instead to do advanced degrees in South and North Indian music and go in other directions.

### ***Drumming and electronics*<sup>1</sup>**

*Drumming* is at the opposite extreme from electronics. (Unless you're playing an electronic drum set!) There seems to be a question of how deeply one can react to the sound of a machine. I used to think that the sound was the sound and that was that, and in a sense I still feel that way. But more and more as time passes, I feel that there is a limit as to how seriously I can take sounds made only by a machine. They may be something glorious, but there is something dubious about that glory. It doesn't have the emotional depth that instrumental sound has – and that may be why some formerly all electronic bands are reaching back to add acoustic instruments. But clearly, a drum is at the extreme end of the scale. It

represents the most primitive of musical instruments. The next step is simply to tune the drum and make it out of wood and one has a marimba or xylophone or make it out of metal and one has a bell or vibraphone or glockenspiel.

### ***Music for Pieces of Wood***

In composing *Music for Pieces of Wood*, I used the rhythmic pattern in *Clapping Music* and the next most primitive instruments – just tuned pieces of wood – tuned claves. I was composing exclusively with “build-ups” or substituting beats for rests. One of my rules of thumb was to try to avoid putting in the downbeat until near the end of the build-up, or actually at the end. That way the ambiguity would be heightened and then the next player would build up still another conflicting rhythm. Basically, the way I was working then was by overdubbing on tape. (That way of working is still the case today but now with the computer; I now play back using MIDI.) The basic pattern would be recorded and then I would add the next clave. What I would try to determine is: “What is the rhythmic distance between the voices? Is it one eighth away, is it two eighths away?” Certain things would recur; for example, three eighths away was frequently an interesting place to end up. Once I had established that rhythmic distance, I would decide on the most interesting note in the pattern to start the build-up and then the next note, and so on.

### ***Six Pianos***

*Six Pianos* began by just improvising at the piano and coming up with an alternating hand pattern. As I said, there was a long period of time when a lot of my pieces were in this all-purpose  $3/2 = 6/4 = 12/8$ . And *Six Pianos*, spontaneously, because of the hand-alternation patterning that I came up with, was a  $4/4$  piece which I always thought was kind of a no-no. “Watch out, that’s the meter that’s going to really get bogged down.” Because of the fact that it really worked, I felt particularly good about *Six Pianos*. It worked well even though it was in  $4/4$ .

### ***Tehillim***

*Tehillim* is a *new rhythmic discovery*. *Tehillim* opens up a new chapter rhythmically, and one that was totally unforeseen. *Tehillim* is the Hebrew word for Psalms and means “Praises.” It comes from the same root, *hey*, *lamed*, *lamed* as Hallelujah. When I set the first text “*hasha mayim . . .* The heavens declare the glory of G-d,” I began to hear, as composers do, a melody in my head. This kind of association of music to words has probably been happening since people have been on the planet. When I said the opening line of *Tehillim*, a melody came to my mind, but at the

same time came, 1 2, 1 2 3, 1 2, 1 2 3, 1 2, 1 2 3. And I said, “what’s that?” Well what that was, in terms of my personal background, was the Bulgarian rhythms in changing meters of Bartók and the changing meters of Stravinsky. These are the two composers that I heard who used rapidly changing meters. If I hadn’t heard the music of Bartók and Stravinsky so many years earlier, I may not have heard those rhythms in my head. Nevertheless, for me it was a whole new rhythmic language and I assumed that it was the nature of Biblical Hebrew that was forcing me into this rhythmic feel. I thought, this is great, this is a whole different rhythmic approach. Instead of  $3/2 = 6/4 = 12/8$ , there was a constantly shifting group of twos and threes that might work out to a phrase like  $7/8, 5/8, 6/8, 2/4, 5/8$ . Every bar was a new meter. Unfortunately, since *Tehillim* was my first piece using this rhythmic language, I wrote some very long bars with many groups of twos and threes because I got involved in trying to notate it in the way the melody actually went. Musically right, but difficult for conductors and string players who have to sit there counting threes and twos, but for a percussionist it’s easy. The singers and woodwinds also seem to enjoy it since it spells out the melodic phrasing.

## Speech rhythms

The use of speech rhythms in *Different Trains* was something new. *Different Trains* for the strings, on the one hand, goes back to my teenage drum studies. The locomotive was represented by paradiddles which came right out of the simplest hand-alternation pattern from way back in my first drumming books. But what was really new and interesting in *Different Trains*, of course, is the fact that the tempos are tied to speech samples. This produces music that constantly changes to an unrelated tempo, and this is something I had never done before. The way to solve that problem with live musicians was simply to have the prerecorded quartets make the tempo changes while the live players paused and then joined in when the new tempo was established. *Different Trains* is for three string quartets, one of which is live and the other two are prerecorded. The prerecorded quartets make the sudden changes in tempo, then the live quartet hears the new tempo and joins in.

In a still more difficult context, that is what happens in *The Cave* because there’s less time spent with each speech fragment and more frequent changes of tempo. The idea of imitating the speaking voice with musical instruments is a totally different kind of rhythmic usage for me. It surely came out of my earlier tape pieces, *It’s Gonna Rain* (1965) and *Come Out* (1966) where both pieces were made exclusively out of repeating loops

of prerecorded speech. The idea that tempo would change suddenly to an unrelated tempo is something that I never would have come up with if it hadn't been for my interest in using the speech samples. I felt that because of the things the people in *Different Trains* and *The Cave* were talking about – the holocaust and religious convictions – I couldn't just sit at my computer and change their tempos. I had to be the faithful scribe and go *with them*, because the speech is consciously a homage to *them*. I believe it really worked in those pieces. *The Cave* is a piece that *definitely* presaged a new kind of musical theater. I had been asked to do operas and I said, "thank you very much, but no." Finally, here was a way to go, and it came out of the idea of following speech melody. I was working in audio tape, but then I thought, what if it was video tape and you could see the interviewees and live musicians sitting right next to them? So, I approached the video artist Beryl Korot and she thought it might be interesting too. We made some tests, really liked them, and for the next three years or so we were off on field trips to Israel, the West Bank, Austin, TX, and then back to New York to record Israeli Jews, Palestinian Muslims, and Americans of all sorts answering our constant questions: "Who for you is Abraham, Sarah, Hagar, Ishmael, and Isaac?"

In *Three Tales*, I said, "let's put the music first. Now let's set the tempo and make the voices fit the music because the subject matter here allows that." Beryl wanted to use one screen instead of five because the technology had progressed so far allowing many images on one screen. Both decisions to keep the tempo constant and to use a single screen made *Three Tales* much more practical to stage and to make a DVD possible – and that is exactly what happened.

## **Musical intuition**

All my compositional decisions are finally based on musical intuition. In the early days, I certainly had clear and firm ideas about making musical changes only through rhythm/duration, and *Piano Phase* and *Four Organs* are excellent examples of that. But in *Piano Phase*, there are three different sections set off by changes of duration – and notes! What are the new notes? Well, here comes a harmonic/melodic decision. In *Four Organs*, the pitches do not ever change in the E dominant eleventh chord, but the tones get longer and longer in duration in this strict musical process. Now, which tones, when, and how much longer in each bar? Musical intuition takes over to work out the exact details of the musical process.

Nobody can have enough technique or enough education, and everybody composes at whatever level they are on. But musical intuition seems

to me to be the real source, and that's just something that people are born with, although it certainly can develop. That's at the root of what I do; I don't think I'm really aware of it. After a while I just understand, "Aha, that's what I need to do."

## **Compositional style**

I believe, although some people may argue, that there's a *huge* difference between pieces like *Piano Phase* and a piece like *Tehillim*, or between a piece like *Clapping Music* and a piece like *Proverb*, and so on. I have very often wanted to do something different because I get bored with what I'm doing, or a text will push me in some new direction, and I like that. I also realize that I may start working on a piece with pulsing pianos, and then, as a result of doing that, something new happens. Before beginning *You Are (Variations)*, I told myself, "let's just do something that's a pleasure and easy to do and see where it goes." As a result, it didn't go where any of my earlier pieces went at all. It started out sounding like other pieces and suddenly there was a big change. So you might say, "there's nothing new under the sun, but the combinations are endless."

### **Note**

1. This paragraph on electronics is from Steve Reich's personal notebook housed at the Paul Sacher Stiftung in Basel, Switzerland, Sketchbook 4, (6/22/71), [p. 33].



PART FIVE

## **Drum sets and drumming**



## 14 In the pocket

### How a drum set player grooves

PETER ERSKINE

The drummer's job in any ensemble boils down to providing rhythmic information to the band and listener while making the music feel good. *Groove* is a suitable one-word distillation of this job description. And while some players come upon the ability to groove naturally, most drummers must make a study of combining a number of skill sets to render music that is considered danceable, no matter the style. *The Oxford Dictionary* offers the following two definitions for the noun groove:

- an established routine or habit: *his thoughts were slipping into a familiar groove*
- a rhythmic pattern in popular or jazz music: *the groove laid down by the drummer and bassist is tough and funky*

and these two examples for groove as a verb:

- dance or listen to popular or jazz music, especially that with an insistent rhythm: *they were grooving to Motown*
- play popular music in an accomplished and stylish manner: *the rhythm section grooves in the true Basie manner.*

I'll admit to being more comfortable with "the Basie manner" versus "tough and funky," but you get the idea.

So a groove can be generated by a single musician, such as a drummer playing a beat, or by two or more musicians playing harmoniously in rhythm, for example, in a rhythm section. Let's look at the components of a *beat*. A drum beat is a succession of notes played in steady rhythm, or within a rhythmic framework, that generally form a pattern often repetitive in construct or nature. A beat works best within any given piece of music when the style of that beat is concordant with the genre, arrangement, or musical orientation of the band for any given song. The best musical results usually occur when a *bossa-nova* tune is given a *bossa-nova* beat, a funk tune is played with a funk beat, 4/4 swing with a jazz ride cymbal pattern, and so on. Genres can be mixed as well as matched, a concept I will explore later in this chapter.

The question, then, is: What defines a particular style? Any and every style of music is determined by the quality of the rhythmic subdivisions that occur within the primary pulses or meter of a piece of music. For example, most pop music employs a straight-eighth

subdivision, while funk utilizes the sixteenth-note subdivision as part of its feel. 4/4 jazz has a primary pulse of four quarter-notes to the bar, and each quarter-note pulse has a swung eighth-note subdivision. This is generally described as a triplet or bounce feel . . . but this is where things get interesting.

By way of demonstration, imagine or sing a typical bebop melody or solo line to yourself. The Charlie Parker tune “Billie’s Bounce” serves our purpose well (See Example 14.1).

Example 14.1 “Billie’s Bounce.”

### BILLIE’S BOUNCE

CHARLIE PARKER

Example 14.2 “Billie’s Bounce,” eighth-notes notated as dotted-eighth/sixteenth-note combinations.

### BILLIE’S BOUNCE

(SWUNG) 8TH NOTES NOTATED AS  
DOTTED-8TH/16TH NOTE COMBINATIONS

CHARLIE PARKER

Example 14.3 “Billie’s Bounce,” swung eighths notated as triplets.

**BILLIE'S BOUNCE**  
8TH NOTES NOTATED AS TRIPLETS

CHARLIE PARKER

Example 14.4 “Billie’s Bounce,” *legato* phrasing.

**BILLIE'S BOUNCE**  
(LEGATO PHRASING)

CHARLIE PARKER

Are the written eighth-notes played or performed as dotted-eighth/sixteenth-note combinations? (See Example 14.2).

... or triplets? (See Example 14.3).

or as straight eighth-notes (i.e., as written in Example 14.1)? ...

OR as straight eighth-notes but played in a *legato* manner with (off-beat) accents? (See Example 14.4).

I submit that the most swinging or grooving rendering of the melody is achieved by employing this last approach. And when that more or less

Example 14.5 Ride cymbal triplet notation.

**RIDE CYMBAL**

Example 14.6 Ride cymbal, tied quintuplet groupings.

**RIDE CYMBAL**

Example 14.7 Swing feel explanation.

**THE SWING FEEL**

“straight” eighth-note feel is coupled with a drummer’s triplet-feel ride cymbal pattern (see Example 14.5), . . . the inherent tension and release creates an irresistible propulsion. It swings. “Groove,” in other words.

Ah! But is the ride cymbal pattern *really* a triplet? This question has different answers, often depending on the tempo of a piece of 4/4 swing jazz, but for musicological purposes, let’s notate this rhythm as accurately as possible (see Example 14.6).

Show me a drummer who visualizes their ride pattern in this manner and I’ll show you a Vinnie Colaiuta. But even a rhythmic mastermind like Vinnie does not conceptualize or think of his ride cymbal pattern in so complex a fashion. The illustration is instructive, however. Successful musicians are guided by instinct more than anything else. *Feel*. A good drummer intuits whether or not a beat works for any particular piece of music, factoring in tempo and levels of density, dynamics, texture (i.e., what parts of the kit he or she is playing), and so on (See Example 14.7).

The rhythmic subdivision expressed by a musician is as revealing as a fingerprint left at the scene of a crime. It doesn't matter if the drummer is actually playing or articulating the subdivisions of any given style or genre of music – think of Jimmy Cobb's drumming on the Miles Davis album, *Kind of Blue*, where maestro Cobb plays a mostly quarter-note pulse during much of the material – as long as the drummer is thinking of the subdivisions to that music. This *singing to oneself* of the subdivisions actually makes the stark quarter-notes swing and groove, much more than if the drummer (or drum machine! More on that soon . . .) merely approached the quarter-note beat as, well, just quarter-notes. Subdivision awareness not only carves out the proper amount of space between each pulse, it also provides *intent*. Intention is a key element of swing or groove, pocket, or feel. We can't merely wish for the music to feel good; drummers must approach any piece of music in rhythmic context in order to groove.

By way of contrast, I submit that so-called disco or machine-made (computer-generated) music does *not* groove. Why? Because there is not enough air, or imagination, or craft, that is, humanity, or what we like to call *soul*. Repetition or consistency alone does not guarantee the best results, but subdivision awareness will.

Humans are not machines. But we do well not to *cheat the beat* when playing any piece of music, that is, rushing the open or empty spaces between the notes that are played. One secret to playing an R&B or pop groove is to sing or think of the backbeat as a *long* note, carrying all the way over to the next primary pulse; in other words, the backbeat is not a short or staccato sixteenth-note, but a lo-o-ong note. Try it!

Some of my personal favorite examples of groove are listed below, in no specific order:

- Steve Gadd "The Jealous Kind," from Joe Cocker's *Stingray* album
- Sonny Payne or Harold Jones with the Count Basie Band
- Papa Jo Jones with the Basie Band
- Sam Woodyard with the Ellington Orchestra
- Ed Thigpen with Oscar Peterson
- Fred Astaire or Gene Kelly dancing
- Mel Lewis with the Bill Holman, Gerry Mulligan or Marty Paich bands
- Motown recordings
- James Brown recordings

Most of these grooves are simple in nature, but they all share an important ingredient: the kinetic element. What is that? Power, and the power of surprise . . . all the more so because of the contrast to the relatively simple beat being played in good conscience and with focused intent. Complexity is fun, and I love Elvin Jones' drumming more than anything

else on earth when it comes to music, but the best grooves are a result of dedicated patience and crafted intensity: focused; surrendering to and serving the song; and simple. They are also all quite elegant. *Groove is the iron fist in the velvet glove.*

Historically, the drums provided a strong pulse in tandem with the band sprinkled by occasional syncopation occurring on the kit. This held true for early New Orleans jazz through swing-era drumming; any accents occurred within four- or eight-bar phrases for the most part. When bebop came along, pioneers such as Kenny Clarke began playing over-the-barline and *dropping bombs* (heavy accents) outside of the usual four- or eight-bar phrase, ending a fill on beat “two” of the new phrase, for example. All of this grooved, but it hinted at things to come. Post-bop drumming began involving more and more complex polyrhythmic devices, for example, Elvin Jones’ and Tony Williams’ drumming. Meanwhile, R&B and funk drumming began similarly to early jazz in which the drums maintained a steady groove without too much deviation or distraction. Ultimately, these types of music benefitted from the evolution of sophisticated additions to the beat, all of which, in both jazz and funk, began to beg the question, “What grooves the best?”

Intuition and common sense suggest that the best groove for any piece of music will occur when all of the musicians are thinking and feeling the rhythmic subdivisions alike, similar to a well-oiled machine where every component is in perfect synchronization. But music, like all art, depends upon counterpoint and the dynamics of tension and release to really flower or shine. And so it goes with some of the most interesting approaches to timekeeping.

As stated earlier in this essay, bebop lines are vertically constructed, generally with lots of eighth-note lines, but played or swung best in a horizontal, *legato*, manner. These eighth-notes are played in more of a duple manner than ternary or triplet feel, with emphases on the off-beat eighth-note. This, in itself, swings quite nicely, but there’s an added element of kinetic energy when the drummer plays the ride pattern with a triplet feel. This “two-against-three” rub lies at the heart of jazz and all music that is derived from African drumming and rhythmic schemata.

Likewise, a swing beat that is played alongside or in conjunction with a Brazilian music style, like *samba* or *bossa-nova*, can groove as much as a purely derived Brazilian beat. This is the same with funk or pop, although it is an exception to the rule – and is certainly not to everyone’s taste – but it is possible. The key element to sell any beat or rhythmic approach is that the drummer must take ownership of what he or she plays. Intent, along with authority, is very important in terms of groove. Tentative does not groove, in life or in music. So, while much of this music is improvised, and



**Figure 14.1** Peter Erskine.

is thus in a constant state of spontaneous composition, there is an element of absolutism that is necessary for an ensemble to settle into or ride on top of a drummer's beat.

### **Key elements**

Timekeeping, or grooving, is not a static thing. Improvisation is a key opportunity as well as an obligation for any drummer who wishes to contribute to the musical well-being of any enterprise. This accompaniment, used primarily while playing along with soloists but also during the melody of the tune, is known as *comping*. When an arrangement calls for tutti section setups or preparation, that is, *fills*, the drummer's role is normally more pronounced than when playing time, but ideally it all should groove.

Improvisatory play while timekeeping is best informed by the drummer being well versed in the vocabulary of any given style of music. Obvious examples include the quoting or calling upon of playing devices and choices made by such drummers as Sonny Payne or Harold Jones when performing a Count Basie big band chart. Or how better to play a James Brown tune than by quoting or emulating the drumming of Clyde Stubblefield or John "Jabo" Starks? The language of modern jazz drumming was developed by such bop-era drummers as Kenny Clarke, Max Roach,

Art Blakey, Philly Joe Jones, Jimmy Cobb, and Roy Haynes. Drummers *must* know much of this vocabulary if they want to play contemporary jazz.

The technical requirements to do this – beyond listening to the source of any style of music to be attempted – are simple enough for any drummer, but daunting to a non-drummer, as the simultaneous utilization of all four limbs in synchronous motion yet independent in terms of their specific or rhythmic chores can be found in few professions; playing the pipe organ in church or flying a helicopter readily comes to mind. Commonly referred to as *independence*, such four-limbed coordination is a staple of modern drumming. The first and most basic playing challenge is for drummers to be able to play the kit with any combination of their limbs in absolute rhythmic unison. This is simple enough when dealing with two limbs but can prove increasingly difficult as voices are added to a pattern or free-flowing expression of ideas while playing time, comping, or filling, that is, setting up an ensemble figure. Since drummers develop playing habits over time, it takes quite a bit of practice to overcome the tendency to play just what the hands and feet know. So, whether the goal is to keep a steady pattern going or to extemporize a rhythmic punctuation, drummers should be able to play what the music calls for or what they hear in their musical imagination. Next, then, is the ability to execute either linear expressions of rhythm or totally disparate rhythmic ideas that create good musical tension. If tension/release is recognized as the motor that keeps improvised music interesting, relevant, and fresh (and all contemporary music should involve improvisation whether soloing or not), then the intelligent use of contrapuntal rhythmic elements is desirable. Off-beat accents, counterpoint, and so on, in the style of the music while maintaining a good beat, are the hallmarks of creative drumming.

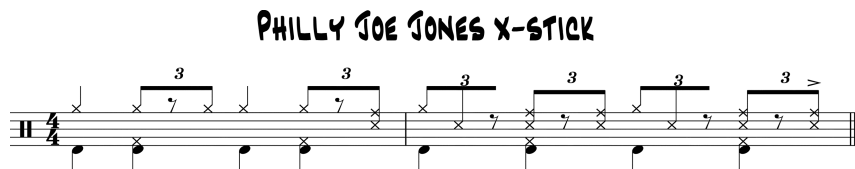
Such rhythmic devices can be played within the grain of the music, or *across the grain*. An example of playing within the grain of music is the following Sam Woodyard cross-stick pattern played while the ride cymbal and hi-hat (plus bass drum if the drummer is *feathering* the quarter-note pulse) maintain the beat (See Example 14.8).

Meanwhile, utilizing the same device but adding an across-the-grain rhythm in the style of Philly Joe Jones results in an irresistible bit of propulsion and adds a tremendous amount of fun to the beat (See Example 14.9).

**Example 14.8** Sam Woodyard cross-stick pattern.

**SAM WOODYARD**

**Example 14.9** Philly Joe Jones off-beat triplet.



The release of the rhythmic tension springs the music forward. While not being quite the same as “the best thing about hitting my head against the wall is how good it feels when I stop,” the effect is similar . . .!

*Clarity* is a key factor in all of this. Clarity is not just about sonic transparency. Clarity has much to do with *specificity*. A good, or grooving, drummer does not add such rhythmic clutter randomly. The grooving drummer is always listening to the music and interjects his or her comments in much the same manner as a well-placed “Uh-huh,” “I see,” or “You don’t say?!” in a conversation. Imagine the musical equivalent to “I want to sue you!” while discussing the weather and you can easily imagine how many drum interjections can go tragically wrong when it comes to music.

Another key component to making all of this sound and feel good is the matter of balance. Drums are, by their very nature, instruments capable of producing a tremendous amount of sound – which is terrific on a battlefield or a football field, but not always so great in a piano trio on a concert hall stage. It is important that the drummer play in such a manner so that every instrument can be heard onstage as well as by everyone in the audience. Such ensemble balance is nearly impossible to achieve if the drum set is not in balance with itself, that is, if the bass drum is too loud or the drummer is always playing the snare drum with rim/head accents (more common than most drummers realize!). This takes a bit of touch, but it is all determined easily enough if the drummer truly listens to what is going on around him or her. There will be plenty of moments when the drums should stand out, but the majority of our playing time should be concerned with achieving a good blend with the other instruments or vocalist(s) in the ensemble.

Lest one think that all of drumming involves *playing well with others*, there are situations when it is best that drummer *not* play with others, at least in terms of imitative ideas. Jumping onto a soloist’s motivic statements by replicating them in unison with the *other* is not always the best creative solution while accompanying them. By way of example: when a soloist begins to play an across-the-grain rhythm such as a hemiola, say, a series of dotted-quarter notes, he or she is most likely doing that because of

the steady groove or pulse being maintained by the rhythm section. It is self-defeating if one or more elements of the rhythm section jump onto that same idea. The hemiola device is most likely being chosen to function as counterpoint to the steady groove, thus creating a nice bit of tension-for-ultimate-release by the soloist, and that is most effective when the rhythm section keeps doing what they were doing in the first place. To illustrate this, I relate an experience I had while listening to the playback of the Weather Report album, *8:30 Live*.

Meanwhile, here I am every night getting ready to play a duo with Wayne Shorter. Mind blowing! What am I doing up here playing with Wayne Shorter? Enjoying it, that's for sure. But I had a lot to learn. For example, Wayne would launch into a rhythmic figure while soloing, and I would hear it and then play it in unison with him. This occurs on the *8:30 Live* album that we made, and while mixing the album, it was just Joe Zawinul and me in the studio with the engineer listening. Joe is standing by these big speakers, I'm standing next to him and we're listening to the track. Wayne and I are playing on the tape and Joe turns to me and says, "Sounds good." I feel proud. Then, just at that moment, Wayne did this whole sequential ascending pattern thing, and I caught it. Zawinul hears that on the tape turns to me with a really sour look and said, "Uhm! Too bad you had to do that . . ."

Later, during a rehearsal, Wayne stopped playing when I did the same thing again, and he said, "Don't do that." I began to understand that the role of the rhythm section is not to play in unison, but to provide the constant as well as the contrast, or counterpoint. So if the soloist starts playing syncopations, maybe you can do counter-syncopations as long as they don't get too busy. Or just keep doing what you're doing, because the soloist is cutting across the grain: that's what makes it cool. Imagine, the rhythm section is a bright blue background and the soloist cuts a brilliant red diagonal stripe across it, it makes no sense for us to turn red. Drumming for me is all about balance. You're balancing dynamically, but you're providing a counterweight to things, and if something is happening in the band, you're either providing a steady pulse or coming up with rhythmic counterpoint that makes the stuff dance.<sup>1</sup>

Another example of *advanced* grooving is when the drums maintain a steady rhythm but one or more of the musicians in the rhythm section change tempo. Sure, everyone can change tempo on a dime and that is fun and musically effective, but imagine the rhythmic tension when the bass begins to push or pull at the fabric of the time (tempo) while the drums maintain the steady tempo, or vice versa. This is a device with which bassist Marc Johnson and I liked to experiment, most notably in the trio we shared with guitarist John Abercrombie, or with Marc's band Bass Desires, with guitarists John Scofield and Bill Frisell; it's, admittedly, a "don't try this at home, kids" musical solution to an as yet unidentified musical problem.

## Drum fills

What is a fill?<sup>2</sup>

A drum fill is a short solo that

1. is played in time
2. carries the music forward
  - a. this could be while keeping time during a song
  - b. playing *behind* (accompanying) a soloist
  - c. playing between the band's written figures in an arrangement
3. is played in the style of the music
4. provides a musical groove
5. can provide excitement . . . plus the unexpected!

Drum fills can be simple or they can be complicated. Fills must be played in time with the rest of the music. The best drum fills provide enough rhythmic information to the rest of the band so that the other musicians can continue playing their best without getting nervous or wondering where the beat is. Fills are timekeeping deluxe. In short, drum fills are musical moments where the drummers can express their own personalities.

A drum fill will most always have a target or destination point. Getting there can be simple. The drummer may also play the sort of fill that is complex or completely unexpected. Which fills sound good or work the best? This is up to you, the drummer. The best way to know is to listen to enough music and drummers so you can decide what you would like to play.

Drum fills do not exist in a vacuum. An effective or good-sounding fill takes the music from where it has been to where it is going. We can practice fills on their own in order to work out and perfect the required stickings, hand, arm, and foot movements. But it's best to play fills in a musical context. It is within this context that you will best figure out what to play where. Whatever style of music you are playing, you can construct fills in one of the following three ways:

1. Play something you have heard another drummer play (and this is okay!).
2. Play something new.
3. Choose *not* to play a fill, and focus purely on the *time* for the moment.

*Listening* can teach us the most when it comes to (re)creating and playing fills. Some musical styles seem naturally to invite particular fills at a particular moment – so, whether your inspiration comes from Philly Joe Jones or Jeff Porcaro, the chances are great that their drumming ideas will serve you well.

Some timekeeping fills are like conversational chance takers. The drummer might not be sure how much space they have in which to

Example 14.10 Famous drum fills.

**FAMOUS DRUM FILLS (SOLO BREAKS)**

**SHADOW WILSON**  
♩ = 176

**BUDDY RICH**  
♩ = 216

**TONY WILLIAMS**  
♩ = 144

**MOTOWN FILL**

speak, but their interjection should certainly be part of the conversation. When it comes to prearranged charts, the drummer's options are more clear-cut: we can either play up until the next tutti entrance, for example, the downbeat or *target*, or the drummer can play through the figure, or over the bar line.

Here is a Top 4 list of famous drum fills – highly recommended listening (see Example 14.10 for notation of these fills):

1. Shadow Wilson's fill on the Count Basie recording *Queer Street*. Buddy Rich said of this fill: "This is the most perfect drum break ever recorded."
2. Buddy Rich's heart-stopping break on *Love for Sale* ("Big Swing Face," 1966); super-human single strokes for three bars, and then one second of silence.
3. Tony Williams' fills on *Seven Steps to Heaven* (from Miles Davis' "live" album, *Four & More*); bebop vocabulary turned upside down and inside-out.
4. The signature Motown drum fill; perfect for the song, every time.

### Four Questions

1. Should we also be aware of the relative dynamics of the music when we play a fill? Should the fill be played loud or soft?
2. Is there a difference between the type of fill that occurs during or between an ensemble's musical phrases and a fill that occurs all on its own without any other instruments playing? What's the difference between a *fill* and a *solo*?
3. What kind of inner dynamics can we utilize in a fill? In other words, how many accents should we add to a rhythm, and where?
4. When playing time, how often should we fill?

### Four Answers

1. If we are truly listening to the music we are playing, then we are aware of the relative dynamics, and we would honor and observe these dynamics. I call it *meeting the energy of the style of music* that we are playing. The use of loud or soft can have a musically dramatic effect, and contrast can be a good idea. Short answer: Use your ears.
2. Short answer: Everything is timekeeping, and it is all music! Longer answer: A fill is much like the next step you take when walking, while a solo is more like doing a tap dance. Whether you choose to add the juggling of flaming bowling pins to the routine is up to you.
3. Notes without accents are like syllables or words without inflection (or like food without spice). In other words, boring. Accents bring music to life and give shape to musical phrases. Just like all of the other drumming decisions you will be making when you play, listening and experience will be your best guides. Personally, getting the *flavor* just right has become the most interesting thing about drumming. Your fills will just keep getting better, trust me.
4. A few years ago, I asked Brazilian pianist Eliane Elias to provide a quote for my first instructional book. Her contribution was “Don’t play a fill every two bars.” Good advice!

Please remember: as far as other musicians are concerned, timekeeping is the most important part of drumming. Always play in such a way that will make the other musicians sound better. Your fills should help create a comfortable *and* exciting musical zone, as there will be times when you will need to bring in players who have been waiting to play (e.g., during a long solo section). Because their instruments might be cold or their attention level not at 100 percent, this would not be a good time to play a lead-in figure that is confusing.

Fills can be played in-between ensemble figures as stand-alone statements. This type of filling is commonly referred to as *playing the holes*. Embellishments can add some nice color and shape to a fill. Practice makes perfect. Better than preplanning which hand to place where on the kit (e.g., when to play a double-stroke in order to easily move from one part of the kit to another), you will want to create your own stickings on the fly.

### Groove as melody

Speaking of stickings, a groove can be a melody played on the drum(s). One of the biggest challenges in playing a groove, that is, a flowing musical statement, can be when the cymbals are more or less removed from the game and the drummer is left to his or her own devices on, let’s say, a snare drum. Short of changing the tension of the drumhead (like a timpani), how do we play or best infer melody *and* groove?

Example 14.11 “Billie’s Bounce,” w/stickings.

**BILLIE'S BOUNCE**  
W/ SNARE DRUM STICKINGS

CHARLIE PARKER  
STICKINGS BY PETER ERSKINE

The answer is in using dynamics and creative stickings. Dynamics imply melodic shape, while stickings help to create and promote a sense of flow not possible with alternate right–left–right, and so on, sticking alone. By way of example, I conclude this chapter by bringing “Billie’s Bounce” back into the discussion. Please note the stickings: the top note of each phrase is played by the dominant hand (in this case, assuming the drummer’s right hand) and accented accordingly, much in the same way a horn player will naturally emphasize the top note of a phrase. Such stickings, employing the use of well-placed doubles here and there and creating *diddles*, allow for a *legato*, swinging and grooving bit of music-making (See Example 14.11).

Whether playing a beat, a fill, or a solo, the musical and musically valuable drummer will strive to groove in all matters musical . . . play in the style of the music . . . know the subdivisions . . . speak the language and use the vocabulary . . . own the tempo. All of this has to do with grooving. It’s a good way to go through life.

Groovy, baby.

### Notes

1. This story is taken from: P. Erskine, *No Beethoven: Autobiography & Chronicle of Weather Report*, R. Mattingly (ed.) (Emeryville, CA: Alfred Music, 2013).
2. The description of drum fills is adapted from: P. Erskine, *Essential Drum Fills* (Van Nuys, CA: Alfred Music, 2008).

## 15 The “Funky Drummer” break

### Ghost notes, timbre, and popular music drumming

STEVEN F. POND

“Eighty percent of what the audience hears should be the bass drum and the [snare drum] backbeats on 2 and 4,” advises longtime funk drummer and educator Jim Payne. “The softer ghost notes should be added without disrupting the basic groove. When you can do that, you’ve got it right.”<sup>1</sup> Instruction manuals, recordings, and online lessons on funk drumming often offer pointed guidance on incorporating “ghost notes” into the mix. Barry Kernfeld broadly defines a ghost note as “a weak note, sometimes barely audible, or a note that is implied rather than sounded.”<sup>2</sup> In the hands of an expert funk drummer, like the influential James Brown alumni Clyde Stubblefield and John “Jabo” Starks, session drummers Bernard Purdie and Steve Gadd, David Garibaldi of Tower of Power, or Mike Clark of The Headhunters, ghost notes become key expressive elements in establishing and propelling a groove.<sup>3</sup> Although one can think of them, simply, as faintly heard notes, primarily on the snare drum, as contrasted with main accented hits, ghost notes also function in two important ways: they add *appoggiatura*-like articulations that inflect an accented note in a groove, thereby adding musical emphasis to the accented note; and they fill sonic space, in interaction with the other instruments within the drum kit and the other instruments in the band, adding to the overall emotional punch of the music.

Funk drummers are also attentive to their instruments’ timbral possibilities. These include drum tuning techniques that incorporate both tone and resonance, choices of cymbals for a variety of noise effects, stick techniques that add a wide variety of sounds, and drum tuning techniques attentive to both tone and resonance, for example, Stubblefield’s attraction to a high-pitched snare drum “pop.”<sup>4</sup> Mark Katz muses, “Imagine the ‘Funky Drummer’ break played with brushes instead of sticks. Or plucked on a harp. Not so funky anymore.”<sup>5</sup> Katz’s provocative thought experiment calls attention not merely to Clyde Stubblefield’s (syncopated) rhythm, but also to the *sound* of one of funk’s most emblematic (and most sampled) breaks, an eight-measure segment from James Brown’s 1970 single, “The Funky Drummer.”<sup>6</sup>

Using the “Funky Drummer” break to illustrate, this essay, although brief, addresses two entwined interests: the ways that drummers use

“ghost notes” and the ways they exploit the drum kit’s available timbres. Together, ghost notes and timbral play add texture and, in the process, contribute vibrantly toward an affective setting.<sup>7</sup> What is it about ghost notes that help to propel a groove, break, or fill?<sup>8</sup> What is it about the *sound* of the drums that conveys excitement or nostalgia or awe? How does the interaction of the drums’ sounds in funk (and rock),<sup>9</sup> and their reproduction for recordings or their setting in live performance, affect the sound of the whole, and how do these sounds drive emotional meanings in the song?

### The “Funky Drummer” break and funk aesthetics

One of the many bloggers who extol the “Funky Drummer” break, SameOldSean retells the story of Brown setting it up with Stubblefield on the spur of the moment. “You don’t have to do no soloing, brother. Just keep what you got,” Brown exclaims on the recording. “And 45 seconds later, Stubblefield does just that. Everyone drops out, and perhaps the most famous eight bars in the history of funk begin.”<sup>10</sup>

Why the instruction to do no soloing? David Garibaldi, outlining twelve key aesthetic considerations for funk drummers, emphasizes that “the dynamic of the jazz tradition is improvisation and the dynamic of the funk tradition is orchestration” and that for a funk groove “everybody has a defined role”; the crucial element is how it “all locks together.”<sup>11</sup> A basic funk tenet is stability; nothing should be allowed to interrupt or confuse the rhythmic flow. Garibaldi’s desideratum for funk drummers is to play “no fills. Zero. None. Have the discipline to lay one groove for the length of the song while resisting the temptation to ‘make it better’ by playing a fill. It’s unnecessary.”<sup>12</sup> His admonition echoes comments about playing behind James Brown by “Jabo” Starks, interviewed with Stubblefield: “We never used the toms. Never, for nothing. And it’s amazing. I kept wondering why we had these drums up here.”<sup>13</sup>

Yet, without intruding on the dance rhythm, by the five-minute mark of “The Funky Drummer” Stubblefield’s ostinato has morphed from the much simpler version at the beginning of the song. That groove features closed hi-hat clicks on every sixteenth-note and shifts the expected kick drum hits on beats *one* and *three* by an eighth-note (thereby recasting them as anacrusis notes, setting up beats *two* and *four*). On snare drum, Stubblefield doubles the accented staccato horn hits in beats *two* and *four* (*2-ee-rest-ah*).<sup>14</sup> Over the course of three minutes, Stubblefield’s groove adds a ghost note here, a crushed left-handed roll there, fueling a barely discernable, rising tension – a tension not fully grasped until a brief

digression by the band to B-flat brings back the introductory tag to reset the song in C, the horn riff now a negative image of the opening one, focusing attention on the *one* beat (3:12): ah-*one*-and. But now, with space granted by the more sparse horn hits, the drum pattern becomes more complicated,<sup>15</sup> soon settling into the pattern that will become the break at 5:22. Stubblefield’s break pattern respects but extends the contours of his groove at the song’s beginning: the missing *one* landing is now solidly supplied by the kick drum, the hi-hat cymbals are opened at the second sixteenth of beat *two* to create a *shhhT* response to the snare drum’s rim-shot call; and ghost notes, both faint single strokes and left-hand crush rolls, fill the spaces primarily in beats *three* and *four*.<sup>16</sup> Those “ghost” notes, small *sotto voce* articulations between the accented notes, do two jobs at once: they interact with the hi-hat’s *shhhT* and the kick drum notes to form a groove matrix. At the same time, they interact with the accented snare “pops” – a self-contained call-and-response cycle.

The break, then, as an elaboration of the earlier basic groove, evolves so subtly over several minutes as to seem unchanged. The incremental additions keep the important, accented notes at the forefront, the ghost notes and open hi-hat hits filling any sonic vacuum. Boiling underneath the rest of the band, the effect is as if it were a protracted, minutes-long crescendo – although the overall volume has not changed – and the sudden falling away of all distractions to the drum pattern as the break begins lends a sense of arrival, a move which should resolve the building tension. Yet, the break doubles down on the groove’s rhythmic intensity.

### Sounding funky

The rhythmic intensity in the “Funky Drummer” break would drive its adoption by hip hop DJs and producers as the can’t-miss command to dance. The break’s rhythmic intensity barely masks an underlying sexual tension.<sup>17</sup> Andrew Ward articulates the perhaps unnecessary point that “dance itself is not just a means to sex . . . it is or can be a form of sexual expression in itself.” Beyond the notes themselves, the enveloping *presence* of the drums adds to the rhythmic urgency of the moment. Brown intones, “Ain’t it funky? Ain’t it funky?” but he might just as well be saying, “Ain’t it sexy?” The “Funky Drummer” break’s sound encompasses several elements – a “dry,” tight click of the hi-hat, an equally dry thud of the kick drum interacting with the tautly tuned snare drum, that drum’s sound itself suffused with a significant wash of ambient reverberation (reverb). As a whole, the isolated drum break, embellished only by Brown’s vocal interjections and a close-miked,

barely audible whisper by one of the band members, possesses great power to get dancers sweaty on the floor.

The reverb sound, mapped onto the played notes, leads the listening-dancer into a subliminal, visceral setting, a combination of intimacy and spectacle.<sup>18</sup> The drum sounds' mixture of the "dry" and resonant offers a subliminal clue. Whether tied directly to space, as in the distance implied in an echo seeming to traverse a certain distance or as psychic distance such as memory – figuratively an echo of the past – any of these contexts will add emotional weight to a sound.

Peter Doyle has written about the mental pictures we construct with echo and reverb effects, the connotations of "place" and "space," whether physical space or an abstraction of "disordered" space.<sup>19</sup> To hear a recording – especially as an audio experience, without the visual cues that a video or "live" performance would offer – is to place oneself within an imagined environment. That reverb helps us imagine a sizeable room, a hall, even if the other elements of the sound – the dry hi-hat clicks, the nonresonating thud of the kick drum – give us a conflicting message. The overall effect places the listener and the drummer in a good-sized hall, the listener sitting (or dancing) in intimate, privileged, proximity to the action. Beyond the image of "real" – that is, imagined – space, Doyle points to record production's and cinema's use of reverb to signal interiority, of voices' "magicality and potency rather than that of their placement within a putative literal field."<sup>20</sup> In the case of the "Funky Drummer" break, the "voice" becomes the reverberant sound of the snare drum.

Along with space, echo and reverb connote time, in two related ways. In one sense, the subliminal calculation of space mentioned above joins with a similar calculation of time. If, say, the entire drum groove had been awash with a uniform echo, my mental image might place me in the same hall, but farther away from the drums, my brain calculating the distance by means of the time it takes between the initial hit and the echoed one, and the duration of its continued reverberation. The emotional weight of my position in this imaginary space might be analogous to being in a cavernous baroque cathedral pew and hearing a chord played on an organ. I may be impressed, even awed, by the grandeur of the cathedral setting and my relative insignificance to the whole, but not by its intimacy.<sup>21</sup> Moreover, other modes of entertainment exert influence: the cinematic convention of using echoes to convey dreamlike states, transitions to flashbacks and the like has trained listeners to associate the device with a certain gravitas.<sup>22</sup>

A drummer who has played on a practice pad knows the slightly frustrating sensation of hitting the pad – even full force – and receiving the sound of a quiet "click" in response. The tradeoff between gaining the reliable feedback about note placement from a stream of clicks (Are the

individual notes discernable and accurately timed?) and getting very little feedback about dynamics and tone makes practicing with a pad excellent for mastering certain rudimentary figures and nearly useless for developing subtleties of sound production. To return to Mark Katz’s thought experiment, imagine the “Funky Drummer” break played on the same hi-hat and kick drum – and a practice pad. Not so funky anymore. The snare drum’s reverberation implies physical space but also conveys emotional authority. With his crisply played hi-hat, kick drum, and snare drum pattern – pointedly with the intricately placed ghost notes – Stubblefield’s affective target is not grandeur, but control, a space between display and intimacy, a space to lose oneself in the erotics of dance.

Offered a solo moment, Stubblefield constructs the drum pattern to fill the sonic (as well as the physical and emotional) space. Or rather, he does so pointillistically, placing a note on every sixteenth-note within each four-beat measure. We require the snare drum’s reverberation to gauge the imaginary hall; but with no visual cues before us – the arc of his arm moving to the cymbal or drumhead, the force of his strike – how will we tell how loudly Stubblefield is playing? Hip hop deejays and producers sampling the break have sought to make the drum sound unambiguously hefty.

### **Low-end theory after “The Funky Drummer”**

The “Funky Drummer” break has become one of the most sampled drum patterns in hip hop, appearing hundreds, and maybe thousands, of times on record (to say nothing of its use on the dance floor by live DJs).<sup>23</sup> Stubblefield joined James Brown’s band in 1965; “The Funky Drummer,” recorded in 1969 and released in 1970, reflects Brown’s proto-funk of the late 1960s, even as it points to the JB’s band that would be formed a few months hence. This was at the tail-end of a period in which AM car-radio airplay could be assumed to be point of delivery for funk or any other style of popular music.

The recent availability of mainstream high-fidelity home stereo components, and FM radio airplay playable on the new systems, was causing large-scale changes in pop music aesthetics.<sup>24</sup> Speakers capable of handling a much wider range of low to high frequencies, previously targeted exclusively to high-priced “high-fidelity” aesthetes, had hit the market in the early 1960s, and by now young consumers found the bookshelf-scaled components affordable.<sup>25</sup> By mid-decade, *Billboard* included a regular feature on “Audio Retailing” that tracked new products and sales trends.<sup>26</sup> Where routine studio practice before had called for a final mix to be done using cheap speakers as a reference for home record players and car AM

radios, now the end-user for records gradually could be assumed to listen on a much fuller range stereo.

At roughly the same time, Ringo Starr (aided considerably by recording engineer Geoff Emerick)<sup>27</sup> began to make significant, and highly influential, changes to the sound of his drum kit<sup>28</sup> tuning his tom-toms lower, with looser heads, and choosing cymbals with dark, slow-developing sounds. Recording practices now emphasized the lower frequencies,<sup>29</sup> starting a trend by Starr toward a lower sound, especially on kick drum and tom-toms. These alterations accompanied changes in his playing style, now with much sparer fills, and the combination sent aesthetic ripples through the ranks of drummers everywhere.

In his earlier groove style, Steven Baur points out, Starr would play a sixteenth-note ride pattern on hi-hat cymbals slightly opened to create a “shrill, pulsating” wash of sound approximating the wall of screams from the group’s fans – the sound of frenzy. Now, both in grooves and in fills at the ends of phrases, Starr would allow plenty of space for the sound of the low tom-tom notes, and the dark cymbals, to develop and blossom, while also leaving room for the increasingly busy production additives (horns, orchestras, effects, and all).<sup>30</sup> The Beatles’ massive popularity, and the groundbreaking approach to record production, especially from *Revolver* onward, guaranteed that drummers would be aware of the new sound, and a domino-effect movement toward deeper and deeper sounding bass drums and tom-toms ensued, coincident with more responsive home stereos to play them on, over the next several decades. To me, the aesthetics of *Revolver* and “The Funky Drummer” coincide at the point of their attentiveness to sound and to sound’s affective possibilities. The two drummers focus their playing styles to fill (or contrariwise, to leave spare) sonic space, and their recordings reflect, in their final mixes, changes in how they would be heard by their assumed audiences; the aggregation of these strategies helps to drive the songs’ emotional impact.

“The Funky Drummer” was used so often in the 1980s and 1990s, the “golden age” of sample-based hip hop, that it became symbolic, a historical reference to that age as well as to its original moment, and is no longer used “straight.”<sup>31</sup> And yet, funky as it is, the “Funky Drummer” break, even at the height of its use in hip hop sampling, hasn’t been used in isolation, left to stand on its own. Instead, latter-day hip hop producers who adapt the break have paid special attention to fattening the bass drum sound, layering additional, deeper pitches over the tenor-sounding bass drum played by Stubblefield, while retaining the clipped hi-hat and high-pitched snare drum sound largely intact.<sup>32</sup>

From its earliest days, hip hop deejays and producers have fixated on the emotional power and impact of low-end frequencies. DJ Kool Herc,

one of the progenitors of hip hop, made his name on the power of his sound system’s ability to pump out more bass volume than his competition, an imperative he absorbed as a teenaged fan of massive “sound systems” in Jamaica’s reggae scene. Similarly, the mid-1980s rise of the Miami Bass style conjoined America’s car culture and bass fetishes: the “cars that go boom.”<sup>33</sup> The bass – especially bass guitar and bass (or kick) drum – holds a key place in hip hop aesthetics.<sup>34</sup>

Yet, Stubblefield’s kick drum is tuned relatively high, and the recording makes no gesture toward favoring the low end. His “busy” playing on the “Funky Drummer” break – amid the snare drum’s reverberation on the recording – fills the sonic void and adds crucially to the break’s excitement, but also provides a perhaps inadvertent opportunity for hip hop producers to adapt the break to their own ends.

This can be heard, for example, in “The Funky Drummer” as it appears in Public Enemy’s landmark “golden age” hit, “Rebel Without a Pause.” Here, the Bomb Squad (the production team of Hank and Keith Shocklee, Chuck D, Eric “Vietnam” Sadler, and Gary G-Wiz) use the “Funky Drummer” break as a basic ostinato, but with two prominent enhancements: a much deeper, louder kick drum sound overlaying Stubblefield’s original notes, and an electronic “science fiction” keening glissando sound, very high pitched, and prominent in the mix.<sup>35</sup> By contrast, now the “Funky Drummer” break is somewhat folded into the overall sound, reinforced by a deep, booming kick drum and a distinct echo in the rapping voice. Now we have a purchase on the volume – and the urgent emotion – of the piece, regardless of the volume knob on our playback device.

The deep, conspicuous bass frequency – often matched with a high-pitched sound – asserts physical, but also economic, power. From hip hop’s earliest days, it was important to be LOUD. DJ Kool Herc famously had the loudest sound system around and would roundly out-volume his competition. Much of that volume came from his massive bass speakers. Simply put, the stuff was both overwhelming and expensive – it conferred emotional power even as it displayed the financial and technical wherewithal to acquire it.

## **Conclusion**

The world of popular music has become filled with a dizzying proliferation of genres, subgenres, and hybrids, adherents often stridently distinguishing each from the other. (How many variants of Techno are there? Of Ambient? Of Hardcore? Of Hip Hop?) Yet, a few overarching aesthetic approaches stretch across wide variations of tempo, groove, harmony,

lyric, vocality, and associated dance styles, regardless of the actual notes played (or, given the dominance of the synthesizer and sampler, “played”). All are discernable through Stubblefield’s ghost-note-laden drumming on “Funky Drummer,” his snare drum’s reverberant sound, and the break’s further appropriation by others: an attraction to filling sonic space, to using loud/soft articulations to convey space and time, to plumbing ambient sounds for their physical and emotive associations, and to pushing the limits of frequency ranges especially at the low end, all in the service of maximum aural – and affective – impact.

## Notes

1. J. Payne, “Advanced Funk Drumming in Depth, Part 1: Four Types of Ghost Notes,” *Modern Drummer* (December 2009), 76.
2. B. Kernfeld, “Ghost Note,” in B. Kernfeld (ed.), *The New Grove Dictionary of Jazz*, 2nd ed., Grove Music Online/Oxford Music Online (Oxford University Press).
3. For ghost note techniques as extensions of snare drum rudiments, see instruction videos by S. Gadd, for example: “Steve Gadd: The Fills in ‘AJA’ – Ratamaques [sic].” See also J. Wald, “The ‘Gadd Flutter Lick’ – The Classic Steve Gadd Ghost Note Drum Lick - Recorded with Zoom Q4.”
4. Stubblefield’s high-pitched snare drum sound is also prized by David Garibaldi, who considers his own version of it to be fundamental to his sound. For Garibaldi’s snare drum tuning techniques, see “David Garibaldi’s 12 Funk Drumming Tips: The Tower of Power Legend Leads a Masterclass in Making It Funky,” *Rhythm Magazine*, 23 (July 2012).
5. M. Katz, *Groove Music: The Art and Culture of the Hip-Hop DJ* (Oxford University Press, 2012), p. 25.
6. Recorded November 20, 1969 and released March 1970 under the King label. Reissued on *James Brown: 1970’s Funk Classics*, Universal/Collectibles 8412, (2004).
7. I use “affective” in the sense of expressing emotion. This is not to claim that ghost notes and timbre are the sole components of funk drumming. For an additional discussion of funk drumming style, see S. F. Pond, “Laying Down a Funk Groove,” in *Head Hunters: The Making of Jazz’s First Platinum Album* (University of Michigan Press, (2010 [2005]), pp. 66–78. For dancers’ feedback as funk authentication, and as improvisatory participants with the groove, see Pond, “‘Chameleon’ Meets *Soul Train*: Herbie, James, Michael, Damita Jo, and Jazz- Funk,” *American Studies*, vol. 52, no. 4 (2013), 125–40.
8. I deploy these terms to clarify the kind of pattern being discussed at any given time, rather than to attempt to define them categorically. “Groove” in particular defies consensus in the literature. In this essay, “groove” refers to a regular ostinato pattern underlying much, if not all, of a song. A groove may be distributed among several instruments – and in the case of the drum kit, across several tonal ranges and timbres – in what I have called a “groove matrix” (Pond 2010), 66–78. A “fill” is a quasi-soloistic figure, often bridging the end of a phrase with the arrival of the next, but it can also be played to thicken the overall sonic texture or to fill a momentary sonic opening. A “break” often hits a mid-point: the drummer plays alone for an extended moment (usually several measures), but generally – as opposed to a fill – keeps to a stable pattern, albeit a more openly virtuosic one than the groove.
9. I am using these terms broadly, to encompass many styles of rock, hip hop, and electronic dance music (EDM), all of which sample, adapt, or recreate the approach to timbre and sonic space I investigate here.
10. SameOldSean, “These Are the Breaks’ – The History of the Backbeat,” blog entry, 11 (February 2014)
11. Garibaldi (2012).
12. *Ibid.*
13. Starks and Stubblefield with Lawrence, *ibid.* More generally in the context of James Brown’s funk music of the time, Clyde Stubblefield discusses the genesis of his approach to groove in a demonstration-interview with Marly Marl: “Clyde Stubblefield/ Funky Drummer” (2008).
14. The groove saunters along in a stable C tonality, although the bass gestures to the subdominant F on beat *four* with a cadential

arrival on the tonic C at the next downbeat; the gesture reinforces the simultaneous sense of stability and arrival at each new measure.

15. For a brief discussion of funk groove as analogous to the two-part construction of clave (one half featuring rhythmic clash, the other resolution), see Pond (2010), 72.

16. For a transcription of the break – which, however, does not distinguish between accented notes and ghost notes – see SameOldSean, *ibid.* For an excellent tutorial on playing the break, with attention to ghost notes, see Sacha K, “How to Play the Funky Drummer Beat (James Brown),” SchoolofMusicOnline.com (June 30, 2012).

17. A. H. Ward, “Dancing in the Dark: Rationalism and the Neglect of Social Dance,” in H. Thomas (ed.), *Dance, Gender and Culture* (New York, St. Martin’s Press, 1993), p. 22. Ward echoes Curt Sachs, who argues that sexuality “can never really be extricated from dance, since the sex act itself may be considered as the ultimate form of dance,” C. Sachs, *World History of the Dance*. B. Schonberg (trans.), (1937), cited in M. H. Nadel and D. Kutschall, “Dance and Sexuality,” in V. L. Bullough and B. Bullough (eds.), *Human Sexuality: An Encyclopedia* (New York: Routledge, 2013 [1994]), p. 161.

18. “Musical experience forces an encounter between mind and body, clearing a liminal space that is simultaneously charged with affect and fraught with tension,” D. R. DeChaine, “Affect and Embodied Understanding in Musical Performance,” *Text and Performance Quarterly*, vol. 22, no. 2 (April 2002), 81.

19. P. Doyle, *Echo and Reverb: Fabricating Space in Popular Music Recording, 1900–1960* (Middletown, CT: Wesleyan University Press, 2005), p. 2.

20. *Ibid.*, pp. 113–14.

21. Doyle explores how the baroque cathedral’s “long reverberations echo the workings of political power, spiritual authority, human sociality and individual transcendence all at once.” *Ibid.*, p. 45.

22. Doyle points to these, but in exclusively spatial terms, even when “space” is construed as a psychic space. To me, the evocation of time is also significant, as I have suggested here, although a full discussion is not possible in this essay.

23. For excellent discussions of groove construction, hip hop aesthetics, and rhetoric, see J. G. Schloss, *Making Beats: The Art of Sample-Based Hip-Hop* (Wesleyan University Press, 2004); R. Walser, “Rhythm, Rhyme and Rhetoric in the Music of Public Enemy,”

*Ethnomusicology*, vol. 39, no. 2 (1995), 193–217.

24. For a discussion of the importance of FM “free form” radio in the late 1960s and 1970s, see Pond (2010), pp. 173–74.

25. Prominent among these were three-way “bookshelf” speakers manufactured by Acoustic Research. “Acoustic Research Posts Peak Year,” *Boston Globe*, (December 18, 1965), p. 21. The term “three-way” indicates the number of speakers in each cabinet: woofer (bass), mid-range, and tweeter (high).

26. See, for example, “Scanning the News” *Billboard*, 78–9, 54: “The electronic home entertainment industry will hold its first national exhibition for the trade in 1967 and annually thereafter.”

27. The Beatles, *Rubber Soul*, Capitol B 1970702 (CD reissue, 2014 [1965]). The Beatles, *Revolver*, Capitol B 1970902 (CD reissue, 2014 [1966]). Emerick became (at nineteen) the Beatles’ lead recording engineer with *Revolver*.

28. Ringo Starr’s contribution to the sound of the Beatles was fundamental and important, but remains largely unexamined in popular music scholarship. One excellent exception is S. Baur, “Ringo Round *Revolver*: Rhythm, Timbre, and Tempo in Rock Drumming,” in R. Reising (ed.), “*Every Sound There Is: The Beatles’ ‘Revolver’ and the Transformation of Rock and Roll* (Aldershot: Ashgate, 2002), p. 82. Additionally, there exist several discussions of Starr’s style on the Internet. See, for example, R. Pagano, “How to Drum Like Ringo Starr – Later Years” (October 23, 2012).

29. Emerick retrospectively demonstrates his approach to the new drum sound – and other sounds in the studio – as he works with The Fab Faux to recreate the Beatles’ “And Your Bird Can Sing.” R. Pagano adds discussion on Starr’s drum tuning. See “The Fab Faux Take a Lesson from Geoff Emerick” (January 17, 2008), [www.youtube.com/watch?v=Z6Kyf9wjZc4](http://www.youtube.com/watch?v=Z6Kyf9wjZc4), esp. 1:38 – 2:25, 3:20 – 4:02.

30. Baur’s excellent article goes into more detail than is possible here (174–75).

31. Stubblefield’s drum break has become iconic, to the point where no producer today would venture to use the sample without a highly creative approach to altering it, Signifyin(g) on the original as well as its historical uses and contemporary competing versions. See Schloss, p. 36. For Signifyin(g) as a rhetorical strategy, see H. L. Gates, Jr., *The Signifying Monkey: A Theory of African-American Literary Criticism* (Oxford University Press, 1988).

32. *It Takes a Nation of Millions To Hold Us Back*, Def Jam, 1127298 (2014 [1987]).

33. The car-bass connection is captured in L'Trimm's 1988 hit, "The Cars That Go Boom," [www.youtube.com/watch?v=okg3UN-GH51](http://www.youtube.com/watch?v=okg3UN-GH51).

34. Several scholars have commented on this. For example, Tricia Rose connects the low register with core affective aesthetics: "Rap music centers on the quality and the nature of rhythm and sound, the lowest, 'fattest beats' being the most significant and emotionally charged." T. Rose, *Black Noise: Rap Music and Black Culture in Contemporary America* (Wesleyan University Press, 1994), pp. 64–65. William Jelani Cobb joins the Bronx-based

early hip hop aesthetic with the "pavement rattling Miami Bass sound," as "hail[ing from] early days of the music in that the MC's lyricism was purely secondary to the intensity that the deejay/producer was putting down."

W. J. Cobb, *To the Break of Dawn: A Freestyle on the Hip Hop Aesthetic* (New York University Press, 2007), p. 53.

35. Hip hop recordings of the time routinely included a high-pitched sound. In addition to its potential affective load, a very high-pitched note, whine, or ting gave the ear a means to calibrate the contrast between high and low, adding even more emotional weight to each end of the frequency spectrum.

## 16 Way beyond wood and skin

### Drum sets, drumming, and technology

J E F F P A C K M A N

It is not unusual to hear drums discussed and even disparaged in terms that evoke the fundamental and even primitive in music.<sup>1</sup> They seem ubiquitous across time and cultures and are based on what appears to be a simple concept – a resonant body is struck to produce a sound, no electronics or much else seems to be needed. Closer consideration, however, paints a different picture. As drum historian Matt Dean notes, preparing a membrane and securing it to a resonating body with enough tension to produce a pleasing sound when struck but without damaging the skin, the resonator, or the striking implement is no simple matter at all. Rather, it requires a great deal of applied knowledge about design, materials, construction, and playing technique: in other words, technology.

Technology is an especially salient matter with respect to the drum set, which, although sharing similarities with instruments that have been played for thousands of years, is the result of innovations that emerged in the twentieth century and continue today. While some aspects of the look, sounds, and playing techniques associated with the drum set in 2015 would likely be familiar to the instrument's pioneers in the early 1900s and other drummers long before, much of what is seen and heard now would be unimaginable to them.

This chapter is about the drum set and the manner in which drummers play it, both of which are and have always been inseparable from multiple types of technology. While this assertion can be made about any musical instrument, several factors make the drum set an especially interesting case of the complex entanglements between human music makers and technological knowledge. Not the least of these is the drum set's relatively short history and its emergence alongside the rise of sound recording, rapid changes in mass media, and widespread industrialization. Also entangled in this web of people, things, and ideas are new musical genres as well as movements of people, culture, and capital, all of which continue to inform the morphology, sound, and performance techniques of the drum set.

The current state of drum set affairs is in many ways defined by an unprecedented range of options. Yet, this abundance of choice is implicated in changes to drumming practice that can be both exciting as remarkable new expressions of virtuosity and musicality and concerning

for their impact on longstanding musical sensibilities and professional opportunities. At the center of these shifts and debates are the myriad ways that people interact with an array of objects, knowledge, sounds, and each other through drumming practices; and at stake are the sounds and meanings of music, drums, and drumming for those who call themselves drummers, those who work with them, and those who listen to their sonic production.

## **Drumming and the collective**

Music has long been studied as social practice – activity that involves many different people doing different things. Indeed, ethnomusicology is predicated on this very conceptualization. Widening possibilities for understanding music in this way, sociologist Howard Becker and musicologist Christopher Small have asserted the importance of people whose involvement in the production of expressive culture might seem minimal, for example, those who make the tools of the trade.<sup>2</sup> More recently, ethnomusicologist Eliot Bates has drawn on the work of Bruno Latour to argue convincingly for the study of “the social life of musical instruments,” in which the “agency” of the instrument, its capacity to inform musical action, is taken just as seriously as that of human musicians.<sup>3</sup>

Without digressing into a critique of Latour’s and Bates’ provocative ideas, I instead draw on their main premise and note that the many materials with which drummers interact can and do shape the manner, results, and meanings of drum set performance. Evidence supporting this is readily available in, for instance, the numerous discussions of equipment in online forums and interviews with noted drummers. Perhaps the traction of this seemingly simple idea – that the instrument one plays matters – is even better exemplified by a recent advertisement featuring contemporary drumming master Vinnie Colaiuta, who states that, thanks to his new drums, “I finally feel like I don’t have to ‘fight’ the instrument anymore!”<sup>4</sup>

This ad and the beliefs about drumming that it conveys suggest a clear resonance with a most basic tenet of Latour’s ideas, which are commonly glossed as actor-network theory, or ANT, that humans do not act independently of each other or nonhumans. To this end, Latour posits the idea of the actor-network in which an actor is anything that is made to act by “a vast array of entities swarming toward it.”<sup>5</sup> Applied to music-making, this implies that music is what it is, sounds how it sounds, and means what it means because of relationships between people, ideas, and things in various and changing combinations.<sup>6</sup> While this might seem obvious, it is a

long way from taking for granted that, for example, a drum set is a drum set or a song is a song and that any artistry (or lack of it) is solely or even primarily the doing of the musician him/herself. This is not to deny the importance of the individual drummer, a key point to which I will return. But it is an important step toward understanding what drummers do as interweaved with the circulation of musical performances, particular ideas about music and the role of drums in it, and the physical instrument itself. This network, then, brings us back to questions of technology, its many forms, and the ways it shapes and is shaped by drumming practice.

### **The instrument(s)**

Several written histories of the drum set take an approach that fits comfortably with Latour's conceptualization.<sup>7</sup> Drum historians typically link key changes in the morphology of the drum set with influential performers, their stylistic innovations, and related emergent musical genres. For example, perhaps the most fundamental technology for making the "modern" drum set what it is, the bass drum pedal, was the result of a confluence of issues and, in Latour's language, actors. In the early 1900s, the economic, spatial, and sonic needs of theater bands prompted the rise of "double drumming," which involved one musician playing the bass drum and snare drum parts normally played by two (or more) people in a marching band. Yet, double drumming also imposed constraints, especially with respect to snare drum technique since practitioners needed to use one hand on the bass drum and thus could not play intricate or even constant snare patterns.

The comparatively simpler role of the bass drum made finding a way to play it with the foot a logical solution; and that is what took place. Various approaches to the problem were pursued, but the pedal designed, patented, and mass produced by William F. Ludwig, Sr. is generally agreed to be the foundation for the device drummers use to play their bass drums even today.<sup>8</sup> After Ludwig's design set the standard, further experimentation has continually led to slight variations, major modifications, and a few radical innovations. Bass drum pedals and technique today, then, in some ways remain close to their early twentieth-century antecedents and in other ways depart dramatically from them.

The other technological innovation that effectively defines the contemporary drum set, the hi-hat, follows a trajectory similar to that of the bass drum pedal. Not coincidentally, the hi-hat also has a foot pedal, and it continues to be a focus of experimentation and innovation both in terms of material design and playing techniques. According to most accounts,

various attempts had been made to devise a foot-operated device for striking two cymbals together and several early devices, snowshoes and then low-boys, were capable of doing just that – and only that. Since these pieces of hardware positioned the cymbals just above the pedal, they could not be struck easily with a stick and were thus limited to providing a “chick” or crash sound via foot movement. However, the story goes, Jo Jones, drummer for Count Basie from 1934 to 1948, elevated the low-boy so that he could play the cymbal pair with his sticks. He also mastered using foot pressure on the pedal to coax different sounds out of the cymbals as he struck them, enriching the hi-hat’s utility as a primary voice for ride rhythms. This paved the way for early forms of “coordinated-independence” – playing an ostinato on a cymbal with one hand and accents on other set components with the remaining hand and feet – which is the norm in (jazz) drumming today.<sup>9</sup> Like the bass drum pedal, numerous experiments, refinements, and innovations have engendered even more uses of the hi-hat by many different drummers.

In discussing these key early technological developments, my goal is not to recount a complete drum set history but rather to raise an important point. Despite the variety of drum set configurations used by drummers today and in the past, bass drums, snare drums, and hi-hats (or more generally, cymbals) remain core components around which many of the most significant technological changes and related technique shifts have revolved.

This is not to say that these “core” instruments are the only sites of dramatic change. For example, the development of specialized brushes (as opposed to actual fly swatters) provided new sounds and approaches to timekeeping that would become central to jazz drummers’ vocabularies. More recently, in search of different sounds and also the feel of a stick at a lower volume, several makers created dowel bundles that are stiff enough to rebound adequately but flexible enough to attenuate volume. Even the humble drumstick is now available in a countless variety of sizes, shapes, and materials, allowing drummers to choose the tool that best suits them and their particular musical situations.

Numerous other technologies have opened new avenues of possibility for drummers. As noted drummer and teacher Ed Soph remarked, tunable tom-toms (as opposed to those with tacked on and, therefore, non-adjustable heads) fostered new techniques since the sounds and pitches of these instruments could now be precisely and consistently adjusted.<sup>10</sup> This point is echoed by Dean, who associates this development with Gene Krupa, Benny Goodman’s drummer in the 1930s, who is widely recognized for bringing the drums into the spotlight with his soloing in songs such as “Sing, Sing, Sing” that feature his tom work.<sup>11</sup> For Soph, Max Roach’s

highly influential “melodic approach” was very much facilitated by the availability of toms with tunable heads.

Then there are the heads themselves, which until the mid-twentieth century were made out of calfskin. As noted by Soph, drummers such as Buddy Rich, Louis Bellson, and many others had certainly mastered a particular touch – not to mention impressive speed, control, and when needed, power – while playing on a surface that could become slack because of weather changes. However, post-World War II developments in synthetics made drumheads made of polyester (Mylar) film possible and profitable. Drum historians tend to agree that this not only changed the sound of drums, but also paved the way for rock by allowing much harder playing without fear of breakage. As plastic heads caught on for drummers in nearly all genres, the warmth and sustain of calf gave way to the brightness and attack of plastic, meaning that individual notes could be heard more clearly at high volume and rapid speed.

Over time, experiments with heads continued, exemplified by the 1970s vogue for the sharp attack and quick decay of single-headed toms, the use of two plies of Mylar (and even a layer of oil between them), adhesive rings and center dots as a means to control overtones, variations in film thickness, and coatings to provide particular sounds and feels. Notably, all of these options in head configuration involve certain trade-offs. For example, longer sustain comes at the expense of articulation clarity, while more damped sound can sacrifice sensitivity, volume, and rebound. Nevertheless, head experimentation yielded choices that continue to inform the sound of particular drummers and even genres of music.

### **Drum sets, drummers, music**

Los Angeles studio drummer and drum educator Ralph Humphrey told me that the most significant changes he had witnessed in drum set technique took place in relation to the music – “what it calls for and what it (or those in charge of it) will allow.”<sup>12</sup> Humphrey’s insight points to yet another factor in the dynamic actor-network of the drum set – it is used primarily in popular music genres. While certainly not absent in contemporary popular music, limitations related to authority (who decides what the music calls for and what it allows) are generally less formalized, institutionally reified, or historically entrenched than, for example, Western (and many other forms of) art music and even many “folk” practices. For example, much popular music that features a drum set often benefits from the input of many people including songwriters,

producers, engineers, and musicians of all kinds including drummers themselves rather than drawing on a tradition of privileging the intentions of an often absent composer and a written score.<sup>13</sup> Further, as Keith Negus notes, change within the context of existing popular music genres is a vital space for creativity and, at times, the emergence of new genres.<sup>14</sup> In many instances, these genre bending and breaking innovations happen from behind the drum set – as was the case with Jo Jones’ hi-hat time-keeping, which established the convention for swing; or Kenny Clarke’s shift to playing time on the ride cymbal and bass drum “bombs” as defining aspects of bebop; or Hal Blaine’s single-headed “concert” toms as a signature sound of 1970s LA pop; or the straight eighth-note, backbeat feel of most rock; or the steady hi-hat sixteenths of disco; and numerous other examples. In a very real sense, drums and drummers help establish what the music calls for and what it will allow.

It is notable that in many instances when the drum set and drum set players serve as agents of musical change, their impact is often amplified (literally) via media technology of various kinds. Arguably, this is best exemplified by yet another moment of radical transformation that was mentioned by both Humphrey and drum set educator Dom Famularo when we spoke: Tony Williams’ recordings as bandleader following his departure from Miles Davis’ group.<sup>15</sup> Williams combined the technical skill, musical sensitivity, and interaction he nurtured with Davis with the power and sonic palette of 1960s era rock to create recorded performances that would influence countless drummers to follow. Of course Williams’ forward-looking fusions were solidly rooted in techniques that earlier jazz, rock, and R&B drummers had been developing for over half a century, many of which were disseminated on recordings.

### **Influence, education, inspiration, imitation**

Musicologist Scott DeVeaux has rightly asserted that jazz history is inseparable from recordings.<sup>16</sup> Much the same could be said about rock, funk, and numerous other popular music practices from around the world.<sup>17</sup> Owing to the drum set’s emergence in the twentieth century, its centrality to jazz, and its prominence in popular music more broadly, it could well be argued that the history of this instrument is also inseparable from recordings.

This does not mean that recordings should be taken as inert documents of drum set performance. As numerous scholars writing about sound recording note, the way the music is recorded also affects what it sounds like and how it is played.<sup>18</sup> Music and technology scholar Paul Théberge

has noted that in multitrack recording sessions drummers often record their parts first with limited information about the tracks to follow.<sup>19</sup> One result of this is that drum parts are often kept simple to avoid clashing with later additions. Another aspect of contemporary recording practice that dramatically affects how the drums are played is the use of click tracks and sequencers – both of which demand an unwavering time feel since their digital precision can spotlight inconsistencies. Cognizant of this, one of the drummers interviewed by Simon Zagorski-Thomas mentioned that he altered his hi-hat technique for studio work, striking the edge of the cymbal pair rather than the bow of the top cymbal, to make his groove sound more in time.<sup>20</sup> Studio veteran Humphrey noted that at times he “plays” with the click when recording – for instance, playing on top of or behind it – according to the feel he aims to bring to the music.<sup>21</sup>

Humphrey’s example in particular also illustrates the honing of a new ability in relation to what some might see as a constraint imposed by typical studio techniques. Along these lines, Soph noted that studio conditions allow him to play as he wishes with less concern for volume. As a result, he is freer to experiment, take chances, and focus on other aspects of his performance, which can lead to new and exciting results.

While the ways technological intervention informs drumming technique in the studio itself might be subtle, the impact of the sounds recorded cannot be overstated. This is because, as noted by Gareth Dylan Smith, the most common way drummers learn to play is by listening to recorded performances.<sup>22</sup> Interviews with famous drummers are full of references to hearing inspirational performances, playing along with favorite recordings, and in many instances transcribing them. Certain trends in recorded drum sound also catch on, for example, Blaine’s concert toms and the dry (and precise) sound of Steve Gadd’s drum sets. Notably, the influential sounds that are circulated are also the result of significant electronic mediation beginning with microphones and extending to gates, triggers, samples, edits, and more. Drum parts in many genres are also performed in part or completely by machines yielding, among other things, a highly quantized and dynamically even time feel. This aesthetic has informed the live playing of several drummers such as Jojo Mayer, who both Humphrey and Famularo noted for his remarkable ability to sound machine-like.

With the increased availability of high-quality, low-cost recording devices, the ability to self-record has also had an important impact on drummers and their technique. In his first interview with *Modern Drummer Magazine*, Dave Weckl described recording himself and critiquing his performances as a means to develop a more mature approach.<sup>23</sup> Self-recording was also the way that he discovered his much copied technique of beat displacement. After listening back to a performance

that he and keyboardist Jay Oliver knew was somehow off, he realized that they had felt the downbeat in different places. By analyzing the recording, Weckl was able to reproduce and continue to develop the “error” into a technique.

The increased circulation of “world music,” further, has made it possible to hear, study, and incorporate sounds and rhythms from diverse drumming and percussion traditions from around the world. On the other hand, drum set techniques developed in North America and Europe have shaped “world” drumming. For example, upon attending a drum clinic in Salvador, Brazil, a local drummer friend and I noted that a prominent Rio-based drummer played samba in a manner akin to stylized jazz samba as might be heard in the United States. Moreover, several drummers I met in Salvador spoke to me about the influence of non-Brazilian musicians such as Weckl, Colaiuta, Neil Peart, and John Bonham.

Recordings are by no means the only way that media technology informs drum set technique. Printed information figures prominently as well. As noted by Famularo, however, for quite some time, Jim Chapin’s *Advanced Techniques for the Modern Drummer* was one, if not the only, instructional book written specifically for drum set.<sup>24</sup> Thus, while countless drummers struggled with the exercises in this highly influential publication, many devised creative ways of interpreting and applying books written for snare drum or as rhythmic studies to the drum set.<sup>25</sup> As instructional books for drum set became more common, a number of authors combined text and recording, providing audio demonstrations of the written exercises and, in many cases, “play-along tracks” for applying the techniques in an ensemble context. More recently, magazines and now the Internet have made notated information about playing drums and play-along recordings even more readily available.

Especially significant today is the proliferation of drum videos. In 1983, the release of *Steve Gadd Up Close* inspired a wave of didactic material that capitalized on increasingly affordable home video equipment to give new insights into the techniques of well-known drummers to people who might never have had such access.<sup>26</sup> Countless drummers today have released videos, which can include demonstrations, lessons on an endless variety of topics, solos, ensemble performances, interviews, and more. Now students can see how to play what in the past could only be heard – that is if it could, in fact, be heard. In many instances, video viewers also get detailed explanations of not only how to execute grooves, fills, and solos, but also the underlying concepts, in some cases conveyed in an accompanying booklet. Affordable video cameras with respectable audio capability and Internet video file sharing has further stimulated the production and distribution of drum videos of all kinds, ranging from

polished, informative lessons to flashy demonstrations of skill to amateurish displays of problematic information. A number of established teachers, including Famularo, have also embraced giving online lessons. Thus, videos and the Internet have had a dramatic impact on the playing of drummers who might not otherwise receive formal instruction. Indeed, all of the drummers in Brazil who mentioned the influence of international drum stars had studied their playing on video.

### **Drum set actor-networks – some issues**

The conditions of possibility for today's drummers are as rich as they have ever been. Inspiration is ample as is information about how to achieve the level of performance showcased on recordings, videos, and concert stages. Equipment improvements and innovations facilitate this by providing efficient, stable, and good sounding tools with which to work. Yet at the same time, as noted by each of the drummers I interviewed, there are also areas of concern especially with regard to the influence of media technology. By way of conclusion, I will address a few more fertile areas of creation arising in the wide network of drummers and technology as well as several problematic issues that were pointed out to me by Soph, Famularo, and Humphrey.

Earlier, I suggested that bass drum and hi-hat pedals are two definitive inventions for the drum set and how it is played and that creative adaptations of these instruments are central to key changes in drum set playing. For example, following Kenny Clarke's use of the bass drum for playing accents, and through books such as Jim Chapin's *Advanced Techniques* and Ted Reed's *Syncopation*, drummers have continued to extend their use of the bass drum. Gadd's first video famously illustrates a heel-toe technique that allows him to play a stream of notes with one foot, and other videos demonstrate techniques such as sliding and pivoting the foot for increasing bass drum speed. Louis Bellson's work with two bass drums in the 1940s also inspired many others to follow suit and move beyond his accomplishments. Famularo, for example, is well known for applying techniques originally intended for the hands (e.g., George Lawrence Stone's *Stick Control*) and applying them to his double bass drum playing. The results of this kind of innovation are evident in the playing of many drummers today who perform double-stroke rolls, flams, and other rudiments as well as intricate rhythms at blinding speed and remarkable precision with their feet or in hand and foot combinations. Their accomplishments were likely facilitated by the increased efficiency and adjustability of pedal mechanisms and then by the innovation of the double

pedal, which is dramatically cheaper and more convenient than two bass drums and two pedals. More recently, extended footboards provide increased leverage and facilitate, for some, the use of heel-toe and sliding techniques on double pedals, thus making even greater speed and power possible. In some instances, velocity and clarity are also facilitated by the use of newly developed bass drum heads with built in dampening rings (or other dampening systems) that help control resonance and change the feel of the playing surface. And of course, recordings, books, and videos have made inspiration and explanation related to emerging bass drum techniques available on a worldwide scale.

While the more dramatic aspects of the drum set's actor-network might be the core instruments I mentioned earlier and various forms of media, the importance of the bass drum pedal and hi-hat stand points out that often drum *hardware* (rather than drums, cymbals, or information about how to play them) is also of tremendous importance. Stands that allow drummers to position drums and cymbals securely and exactly where they want them allow for the customization of the instruments to suit individual bodies and objectives. There are numerous examples of this but boom stands for use with multi-tom and multi-cymbal setups and hi-hat stands with two legs or swiveling tripods that allow for tight positioning next to the auxiliary footboard of a double pedal are certainly significant for their ergonomic implications. The combination of the boom stand concept with the high hat, the "x-hat," means that this key component can now be placed nearly anywhere on a set, a point noted by Soph. This facilitates, among other things, complex two-handed hi-hat patterns and the playing of a closed hi-hat in conjunction with double bass drums. Pushing this idea further, "remote hi-hats" allow for a fully functional cymbal pair to be placed in nonconventional locations thereby opening up new technical and musical possibilities.

Much as hi-hat technique has benefited from hardware that allows more flexible positioning, the technology at the heart of the double bass drum pedal, the universal joint, has made it possible to play "remote" bass drums. Now, drummers such as Terry Bozzio and Thomas Lange use multiple bass drums and pedals to create intricate combination patterns that Famularo likened to organ pedal work. Such pedal configurations often include remote hi-hats as well as pedals that strike instruments such as cowbells, (synthetic) "wood" blocks, and more. Here, sonic inspiration, mechanical development, and hard work engender complex coordination that moves well beyond the then radical changes disseminated by Chapin's *Advanced Techniques* and recordings of bebop drummers.

As might be expected, much of this innovation has been supported by didactic videos and publications. For example, Gary Chester's *New Breed*

extends the idea of coordinated-independence while incorporating the use of new technologies such as supplementary hi-hats and especially the click track.<sup>27</sup> This book has had significant impact on contemporary playing in part because one of its early champions was Dave Weckl, who shook the drum world with, among other things, his Chester-inspired grooves and creative use of a second hi-hat.

Part of Weckl's appeal was also his drum sound: a dry, focused sound traceable to one of his key influences, Steve Gadd. A number of technological factors contribute to this sound – head choice, miking, shell material, bearing edge shape, and more – and while more resonance is once again the norm in most drum mixes, it is typically complemented with a focused attack and reduced overtones that increase clarity and the articulation of individual notes. As Famularo told me, this sound helps drummers play with more control and precision. On the other hand, certain music such as acoustic jazz still emphasizes a more open, ringy tone. The importance of this is suggested by something I saw at a drum clinic in the late 1980s in Los Angeles. A drummer widely acclaimed for his fast, articulate, and precise playing was asked to demonstrate his jazz playing. He qualified his demonstration by stating that the set he was playing – one with more dampened toms and bass drum – was not conducive to creating a convincing jazz feel, a time sensibility that Humphrey described to me as “elastic” when discussing highly influential jazz drummer Elvin Jones.

Even with the typically more open sound of drums in the 1940s, 1950s, and 1960s and the related elasticity of time feel played by many of the drummers working in those eras (and many performing in more traditional jazz styles today), it would be a mistake to suggest that such playing is not fast and precise in its own way. Yet, many drummers today have taken speed and precision to new and very different places with their exceptionally clean playing that often involves linear combinations of the hands and feet. Striking examples of this have been disseminated globally in the various videos of so-called “Gospel Chops” drummers, launching several of the featured musicians to high-profile gigs and drum hero status.<sup>28</sup>

As inspirational as these and other similar performances are, their availability and popularity are also at the heart of concerns expressed by the drummers with whom I spoke about the state of current drum set playing. While all were enthusiastic about what is happening, they also expressed certain reservations about the overabundance of unfiltered information available and lack of critical engagement with it. Famularo thus noted how important it remains for students to find someone who can help them sift through mountains of book and video possibilities on the market.<sup>29</sup> Soph, on the other hand, spoke more directly to questions of use,

noting that far too many drummers treat videos purely as “entertainment.” Not discounting the importance of entertainment or inspiration, he mentioned that he sees many aspiring drummers who clearly pay little or no attention to anything but drummers playing fast and flashy. To this, he added that the very drummers who showcase their exceptional chops on video (including several of his former students) also play great time with appropriate restraint when called for.

Importantly, as noted specifically by Humphrey, not all drummers learn and apply information in the same way. All three teachers also mentioned that no method is perfect and effectiveness is contingent on the quality of the material, its application, and often employing a balance of approaches. For example, Humphrey, Famularo, Soph, and countless other drummers stress the importance of listening. Interviews with drumming greats are full of references to how hearing a particular musician opened up new avenues of performance and often how transcription was a vital tool to unlock what they had done.<sup>30</sup> Yet, Soph also discussed what he called the “myth” of transcription – that many drummers can either place too much faith in the process or, more commonly, focus on certain details of a drummer’s performance rather than gaining a more well-rounded perspective of how it relates to its musical context.

Soph’s critical perspective on transcription translated to his views about books. Again, never doubting their usefulness, he expressed concern that too many drummers get locked into book learning and fail to get beyond what is on the page. Adding to the risk of misapplication or overfocusing and raising the stakes for guidance through the overwhelming number of available books is Humphrey’s concern about what exactly has been written. He noted that no one book does it all when it comes to drum set. That is, there is not, in his view, a comprehensive guide for the instrument, making careful selection and application of what is available all the more important. Famularo’s perspective lines up well with those of Soph and Humphrey with the added caveat that there is a tremendous amount of crossover and redundancy, even plagiarism, within the literature. He noted that, in the rush to make material available (for the sake of income, publicity, or even with an earnest pedagogical aim), many drummers recycle ideas or only slightly vary what others have already done.

None of these educators suggested that technology including new types of equipment, better versions of old equipment, videos, recordings, and method books are not vitally important to the many significant developments in drum set performance that continue to take place. Yet, each of them advocated both balance and a critical approach to using the ever-increasing amount of material available. Again, the idea of considering what music calls for and what “it” will allow is key. The challenge, then, is

to develop a sense of this changing set of constraints and possibilities and find ways to work toward it.

## **Concluding thoughts**

The question of musical constraint and possibility is no small one if for no other reason than there are more niches for drum set performance than ever before. Where drums might be viewed by some as primarily accompaniment instruments, the proliferation of drum clinics, videos, and now contests (many of which are circulated on video or YouTube) has created a space that encourages and even requires drummers to stand out, often through speed and flash. Playing a great groove in these contexts generally will not satisfy the judges (or many audience members). At the same time, the ability to keep time musically and tastefully accompany a band does not go out of style, and drummers noted for their sense of groove tend to keep working. On the other hand, with the circulation of music from all over the world, increasing studio savvy, instrumental skills, and a related continual push on genre boundaries, a great deal of music calls for and will allow new drumming approaches. This is in no small measure due to recent changes in the music industry such as an explosion of self-production and distribution. In this sense, many constraints that might have been imposed by producers, A&R people, or label executives have been eased greatly. At the same time, however, as Humphrey stressed, it has become more difficult to make a living playing drums despite the fact that it is arguably easier to make one's drumming audible. He further lamented that the LA studio scene has experienced a significant decrease in the amount of work available since so much drumming is now programmed. In yet another irony, however, he told me that where in the past he was commonly required to play very strictly orchestrated and precisely notated parts, machines now provide that function. As a result, he is more frequently asked to lend his vision to more loosely conceived parts, thus upping the stakes for his personalized style, feel, and sense of what the music calls for.

Music and the music business have seen radical and constant change during the entire lifespan of the drum set. Accordingly, the instrument and the way it is played have never stopped changing. As each of the musicians with whom I spoke asserted, the human contribution to the state of drumming – regardless of, or perhaps in spite of technological actors and the importance of actor-networks – is undeniable. On the other hand, few drummers would likely state that technology of various kinds does not inform what they do in profound ways. Even if it does not cause better playing, somehow seeing or hearing

a great performance, live or recorded, rarely fails to make a drummer want to play better. New drum books or new approaches to old ones *do* make many drummers want to practice. And sitting behind a great sounding, great feeling drum set is nearly always a surefire way to make a drummer want to drum.

## Notes

1. Peter Avanti relates the apparent timelessness and ubiquity of the drum set to his assertion that percussion instruments, though not drums specifically, “were the first musical technologies after the human voice and body.” P. Avanti, “Black Musics, Technology, and Modernity: Exhibit A, the Drum Kit,” *Popular Music and Society*, vol. 36, no. 4 (2013), 481.
2. H. S. Becker, *Art Worlds* (University of California Press, 1982); C. Small, *Musicking: The Meanings of Performing and Listening* (Hannover: The University Press of New England, 1998).
3. E. Bates, “The Social Life of Musical Instruments,” *Ethnomusicology*, vol. 56, no. 3 (2012), 363–94. This notion of object agency is elaborated in B. Latour, *Reassembling the Social: An Introduction to Actor-Network Theory* (Oxford University Press, 2007). As Bates notes, this aspect of Latour’s work has been a focus of his critics.
4. “Welcome home Vinnie Colaiuta,” [www.ludwig-drums.com/features/vc/](http://www.ludwig-drums.com/features/vc/)
5. Latour, *Reassembling*, p. 46.
6. See B. Piekut, “Actor-networks in Music History: Clarifications and Critiques,” *Twentieth-century Music*, vol. 11, no. 2 (2014), 193.
7. For example, Avanti, “Exhibit A”; Bob Breithaupt, “The Drum Set,” in John Beck (ed.), *Encyclopedia of Percussion*, 2nd ed. (New York: Routledge, 2007); M. Dean, *Drum: A History* (Toronto: Scarecrow Press, 2012).
8. See Avanti, “Exhibit A,” 483–89 for a concise, detailed discussion of early bass drum pedals.
9. Breithaupt, “Drum set.”
10. E. Soph, Telephone interview (December 12, 2014).
11. Dean, *Drum*, p. 201.
12. R. Humphrey, Telephone interview (December 28, 2014).
13. See P. Kivy, “Live Performances and Dead Composers: On the Ethics of Musical Interpretation,” in *The Fine Art of Repetition: Essays in the Philosophy of Music* (Cambridge University Press, 1993).
14. K. Negus, *Music Genres and Corporate Cultures* (New York: Routledge, 1999).
15. D. Famularo, Skype interview (December 19, 2014).
16. DeVeaux also advocates for understanding jazz recordings as complex materials to be analyzed critically rather than as transparent artifacts of history. S. DeVeaux, *The Birth of Bebop: A Social and Musical History* (University of California Press, 1997), pp. 40, 365–66.
17. See P. Manual, *Popular Musics of the Non-western World: An Introductory Survey* (Oxford University Press, 1988), pp. 3–4.
18. For example, R. Philip, *Performing Music in the Age of Recording* (Yale University Press, 2004) and M. Katz, *Capturing Sound: How Technology has Changed Music* (University of California Press, 2004).
19. P. Théberge, “The ‘Sound’ of Music: Technological Rationalization and the Production of Popular Music,” *New Formations*, 8 (1989), 99–111.
20. S. Zagorski-Thomas, “Real and Unreal Performances: The Interaction of Recording Technology and Drum Set Performance,” in A. Danielsen (ed.), *Musical Rhythm in the Age of Digital Reproduction* (Surrey: Ashgate, 2010).
21. Humphrey (2014).
22. G. D. Smith, *I Drum, Therefore I Am: Being and Becoming a Drummer* (Surrey: Ashgate, 2013).
23. J. Potter, “Dave Weckl,” *Modern Drummer*, 10 (October 1986), 16–21, 48–61.
24. J. Chapin, *Advanced Techniques for the Modern Drummer Vol. 1: Coordinated Independence as Applied to Jazz and Bebop* (Emeryville, CA: Alfred Music [1948] 2002).
25. The two most notable books of this type that were mentioned by Soph, Humphrey, and Famularo are G. L. Stone, *Stick Control for the Snare Drummer* (Emeryville, CA: Alfred Music [1935] 2009) and T. Reed, *Progressive Steps to Syncopation for the Modern Drummer* (Emeryville, CA: Alfred Music [1958] 1997).
26. S. Gadd, R. Wallis, and P. Seigel, *Steve Gadd Up Close* (New York: DCI Music Video, 1983).

27. G. Chester, *The New Breed* (Cedar Grove, NJ: Modern Drummer, 1985).

28. For example, *Shed Sessionz, Vol. 1* (Gospel Chops.com, 2006). For a scholarly study of gospel drumming, see D. Stadnicki, "Enjoying Gospel Drumming: An Investigation of Post-racial Appropriation, Consumption, and Idealization in Contemporary Black

Musicianship," unpublished MA thesis, Carleton University.

29. See K. Miller, *Playing Along: Digital Games, YouTube, and Virtual Performance* (Oxford University Press, 2012).

30. See, for example, Potter, "Weckl." Various technologies have long been available to aid transcription.



PART SIX

## **World percussion**



## 17 Speaking of rhythm

RUSSELL HARTENBERGER

The list of Western musicians who have been influenced by the music of India is lengthy, and the ways they have incorporated elements of Indian music in their own styles is wide ranging. From John Coltrane, George Harrison, Yehudi Menuhin, and John McLaughlin to Olivier Messiaen, La Monte Young, Terry Riley, and Philip Glass, performers and composers in the West have sought ways to use Indian musical ideas in their art forms. One of the most innovative groups to combine Indian and Western musical styles is Autorickshaw, a Toronto-based ensemble featuring South Indian/jazz vocalist, Suba Sankaran. Suba's background is unusual in that she has extensive training in Karnatak<sup>1</sup> music of South India, Western classical music, and jazz. In Autorickshaw, Suba is joined by *tabla* player, Ed Hanley, and multi-instrumentalist, Dylan Bell, in combining elements of both South and North Indian music with jazz and other contemporary music genres.

Suba's father, Trichy Sankaran, is one of the most highly esteemed musicians in India. Sankaran<sup>2</sup> is a disciple of the legendary *mrdangam* master, Sri Palani Subramania Pillai, and, in 2011, was awarded the prestigious title *Sangitha Kalanidhi* for his contributions to the world of Karnatak music as performer, scholar, and composer. In addition to his performances with all the leading musicians of South India, Sankaran has collaborated with Nexus, Glen Velez, Ghanaian drummer Abraham Adzenyah, *tabla* master Sharda Sahai, Evergreen Club Contemporary Gamelan, John Wyre's World Drum Ensemble, and many musicians from the worlds of jazz and contemporary music. Sankaran is a composer, Professor Emeritus of Music at York University in Toronto, and the author of the books, *The Rhythmic Principles and Practice of South Indian Drumming* and *Konnakol (Solkattu): Spoken Rhythms of South Indian Music*.

The background and experience of both father and daughter give them legitimacy in their performances as well as insight into the pedagogical, theoretical, and cultural issues that emanate from their fusion of Indian music with Western musical traditions. In August 2014, I met with Sankaran and Suba and asked them about the influence of Indian music on Western music and the issues that arise from combining elements of both, including questions of authenticity and cultural appropriation. In the



Figure 17.1 Suba Sankaran and Trichy Sankaran.

following conversation, we discuss these issues as well as the difference in the approach to the study of rhythm in India and the West.

- RH: Suba, tell me about your training in both Indian and Western music.
- SUBA: I was born and raised in Toronto, but with a master drummer for a father, so my South Indian music training commenced quite early on. Basically when I learned to speak, I also began singing, starting with some of the short songs called *gitam*. I took piano lessons at the age of six and started choral singing about that same age. I went through the Royal Conservatory of Music piano program, and there I learned a lot about theory, harmony, counterpoint, and analysis. I attended an art school in high school, starting as a piano major, but eventually moved into the vocal program. That's when I started conducting, directing choirs, creating my own choirs, making arrangements, and composing. After high school, I enrolled in York University to do a Bachelor of Fine Arts and then a Master's in Ethnomusicology. Off and on I still studied South Indian singing and sometimes drumming as well. Even though I began doing jazz in high school, I only really got into it and more contemporary improvisational styles in university. That's where I discovered that I had a real knack for improvisation and rhythm that is inherent in a lot of that music. Ever since, I've been straddling the worlds of East and West, but eating, sleeping, and breathing music all the while as composer, arranger, performer, producer, and singer.
- RH: In relation to your Indian music training, did you take singing lessons with your father or someone else?

- SUBA: I mostly took singing lessons from my father, although my mother also did some singing – not professionally, but there is always such a background just from the cultural perspective. We also had a lot of visiting artists from India come to our home. It's the tradition and obligation of the senior artists to pass the torch and impart their knowledge to the younger people, so I studied with many of the musicians who came through our home in my early, formative years.
- RH: You must have learned about rhythm and drumming from your father. Was that around the same period of time?
- SUBA: I started on the drums when I was six or seven. I played a little bit of *mrdangam*, mostly the basic lessons. My father also introduced me to the *kanjira*. It was a smaller instrument and I had small hands at the time and the drums were quite large. *Solkattu*<sup>3</sup> was something I really took to, and that's something that became kind of a game when I was younger. Other families played "name that tune," but we played "name that *nadai*."<sup>4</sup> That's what we did around the kitchen table.
- SANKARAN: I also trained Suba in learning to keep *tala*.<sup>5</sup> I don't normally use a metronome because my training is different, so I would test her to see if she could keep *tala* to some of the more intricate patterns.
- RH: Sankaran, what kind of education did you have in Western music, or did you have any in India?
- SANKARAN: In India, none; it was all Karnatak. When I arrived here, it was all quite new to me, but I gradually absorbed and adapted myself to Western music and methods of teaching. I was able to read Western notation slowly and write slowly, but the rhythm was no problem for me. All these whole-notes, half-notes, quarter-notes were easy for me, but to understand the key signatures and so forth took me extra time.
- In 1980, I taught part-time at San Diego State University and shared an office with a professor who had a piano. Since I had more time there, I enrolled in the basic Western classical musicianship course and practiced the piano. Later on, when I began composing, this came in very handy. Learning Western music was an essential part in translating many of the *korvais*<sup>6</sup> into Western notation. I realized how important it was for anyone to have some basic education on the piano, and to be able to read and write Western notation.
- To take it further, I got involved with gamelan music in 1984 when my first composition, *Swaralaya*, was performed by the Evergreen Club Contemporary Gamelan Ensemble. In preparing a score for the ensemble, we debated about the cipher notation of gamelan – Javanese music goes one way and Balinese music goes the other way with the numbering. Finally we decided it was better to go with Western notation, so I prepared a Western score for *Swaralaya*.
- RH: One of the things I am interested in is the learning process with notation and without notation since both of you have learned each way.
- SUBA: Having started with South Indian music and learning everything by rote, learning aurally, I've always relied on my ears rather than my

sight for music. I didn't know this when I was very young, but I have perfect pitch. For me, sight-reading took me longer to do, because my ears always wanted to take me somewhere else. While I was sight-reading some Bach, I sort of made up the rest of the harmony. So in a way, I ended up improvising. It was fascinating for me, but frustrating for my teachers. I spent a lot of time in my middle school and high school years working on that. I read piano scores, almost eliminating the ear factor, and figured out how to sight-read, and also how to sight-read multiple parts.

When it came to learning music later, I found that it was quite easy to memorize everything, and I think that was from my South Indian training. In university when I sang interesting rhythmic passages in pop songs, for example, sixteenth-note passages with a lot of accents, I used *solkattu* to dissect what was going on so I could get a sense of what I was really supposed to be feeling in my body. I translated it into *solkattu* and then brought it back again. I found it very interesting to go between this idea of making music with my eyes and making music with my ears. More often than not I rely on the South Indian way of learning than the Western way; I superimpose South Indian on the Western more often than the other way around.

RH: Sankaran, you came from the Karnatak tradition and had to learn the Western way of dealing with music. What was that like?

SANKARAN: I come from a tradition where the music is memorized and learned at the feet of the teacher in the *gurukala* system. At the time that I studied, it was up to the teacher when he would be in the mood to teach, so the student should always be prepared. This teaches you patience; you have got to be really patient to learn from the teacher. And then, no questions could be asked. You can't ask, "why is this, why is that?" No. One time he says *kita taka thom*, another time he says *tere kita thom*. So you want to ask, "why are you saying *kita taka* one time, and another time you are saying *tere kita*?" No, you cannot ask. Later on, in my own teaching and research, I found answers to these which I have included in my *solkattu* book.

The old *gurukala* system is really to prepare you for *self-discovery*. You have got to discover yourself how *korvais* or *moras*<sup>7</sup> work in the *tala*. It is great training for the brain. I cannot overemphasize the importance of this oral tradition method by which we retain many of the intricate patterns all in our memory. Another advantage of the Indian system of training is getting up in the early morning and trying to practice. Practicing in the morning is advisable for good memory and for practice in all fields whether it is *mrdangam*, vocal, instrumental . . . anything.

Memory is something really amazing, and I try to point this out to Western music students. When they are so engrossed in reading the music, they are not really able to hear themselves. If I may say, I think notation closes off some venues for expression. Western students are

so involved in reading they are not able to feel a triplet happening somewhere in the music. Whereas in the Indian system, you really learn to master and to feel – *feel the rhythm*. That intensifies your training and you are able to handle rhythm in a better way.

RH: When you say, “feel rhythm,” what is it that you are actually feeling?

SANKARAN: Perhaps I can explain by discussing the term, *layam* or *laya*. *Layam* is really fundamental and has two important meanings. People generally relate it to the rate of events: *vilamba laya*, *madhya laya*, *drutha laya*, or slow speed, medium speed, and fast speed. It also has a special meaning: the interval between two events. The interval – that is really the *layam*; in other words, duration. The duration is fundamental in realizing rhythms. *Laya* is also equated with yoga or meditation. So when we say we have to relax, we have to find external factors when we are dealing with intricate or complicated rhythms. You cannot do it in a rush or when you are in a hurry. But what it means is, we have to calm down; we have got to focus. Whenever I talk about *laya*, I say it has a melodic perspective, a rhythmic perspective, and a spiritual perspective. It is the spiritual perspective of *laya* where you learn to feel and experience time. Essentially, *laya* is the consciousness of time – being tuned in to time.

SUBA: I think of that idea of feeling the interval between two spaces when I am telling my students about South Indian singing. The microtonal inflections between certain notes I often call the universe within two notes. I tell students to feel what that universe is rather than thinking in terms of whole-tones or semi-tones. Think of what it is to be inside the music and to swim in this ocean that we don’t quite understand yet. I also think there is a melodic equivalent to *laya*. It’s much more obvious in South Indian music, but in jazz, when you’re scat singing over something, or when you’re improvising, there has to be an under-current of rhythm that is internalized so that you can float on top in a way that is meaningful. And it should have certain points of contact with the rhythmic grid so you are able to dance freely within it. In jazz, we often call it the “groove” or being “in the pocket”; really feeling the beat. But when we talk about *laya*, it’s a much deeper concept of flow and fluidity. This also occurs in classical music, but it is something we don’t often think about. For example, the architecture you find in Bach’s music – there’s so much rhythm in there. There’s flow inside it, so many counter melodies, and so much subdividing that happens on melodic, harmonic, and rhythmic levels.

RH: This brings me to the topic of *tala*. Sankaran, we have talked before about how you always have the *tala* going on in your head when you’re playing music, whether it’s South Indian or other music. Even when you play Western music you have a sense of *tala*. Can you explain how that works?

SANKARAN: *Tala* is the external manifestation that gives us the cycle of eight beats, fourteen beats, and so on. *Tala* is something that you use to organize

rhythm in a certain way. *Laya* is the real rhythm. How accurate you are is what is really important. This kind of feel stays with me all the time. So yes, I do translate the Western bars into a *tala* in my head when I perform with Western/contemporary musicians.

Another interesting feature is the concept of *downbeat*, especially the first beat in a *tala* cycle we call *sam*. An enlightening experience occurred when I was featured in a performance with the African drummer, Abraham Adzenyah. During our solo section I was looking for *sam* in African drumming, but there is no such thing as *sam* in their music. At one point I said to myself, “forget *sam* and go with the flow.” That is what really triumphed in that performance.

RH: Suba, how about you in relation to *tala*? One part of your life is in *tala* and the other part is not in *tala*. It must make you schizophrenic.

SUBA: Either way, I think the *tala* is always in the back of my head. In Chopin, you have these really interesting bars of, say, fifteen over four. I always had to translate it in terms of *solkattu* so I could understand it, rather than having it feel like a bunch of notes that fell within this time period. When I’m mixing different styles of music, let’s say I’m taking a jazz standard but I’m giving it a little dose of Bollywood, I might have the rhythmic part be extremely South Indian versus the jazz scat singing that goes on top of it. I find that *tala* motivates a lot of my decisions in terms of how I arrange music as a sort of hybrid music or Indo-fusion, whatever that fusion may be.

From a choral perspective, I often think of conducting as a larger version of *tala*. So where we have one-two-three when we are conducting, it’s similar to *rupaka tala*.<sup>8</sup> Keeping *tala* is a much more condensed version of conducting, and it is very much an external feature of the rhythms that we feel.

RH: You have worked in both Indian and Western music. What are the cultural issues to consider?

SUBA: I’m constantly thinking about that when I’m arranging for Autorickshaw or composing in multiple styles. I often like to say that I try to be sensitive to the cultures that I am borrowing from and to be sensible about how I bring those pieces together. In Bollywood music, for example, you see only the surface level aspect of Western music. They know what they know when it comes to Indian music, but the Western orchestration or harmonies that are superimposed can be quite tenuous and very simple.

When I’m approaching arranging or composing, especially for a group like Autorickshaw, I think about what’s going to make the most sense. An example is my version of “Bird on a Wire,” by Leonard Cohen. I found that it could really work well in a slow seven-beat *tala*. Then, the bass player at the time, Rich Brown, created a bass line that was a little bit outside of the original and ended up being in the Lydian mode. We have an equivalent in South Indian music, the *kalyani raga*, so I thought, “oh I could actually just keep the melody intact.”

I didn't want to mess with it too much; it's beautiful poetry and it's a lovely melody. I could have created something completely different, but I ended up just deviating from it. It doesn't sound anything like the original unless you put it under the microscope. The melody is the same except for that one note, but there are all these microtonal inflections in it because I chose to look at it as the *kalyani raga*.

So I'm constantly thinking about what might work and what might not, what's a good balance between the different styles. Is it meant to sit more on, say, the jazz spectrum or the Indian spectrum? It's on a case-by-case or song-by-song basis that I make these decisions. There is such a treasure when it comes to melodies and rhythms in Indian music, so I find that's the place where I'll often go. But when it comes to harmony or counterpoint or orchestration, it will be on the Western side just because that's where the wealth is.

RH: You have legitimate training in both areas, so people can't accuse you of not treating both traditions with honesty and integrity. In a way, that's an advantage for you.

SUBA: I think so, too. I would feel pretty sheepish if I didn't understand what I was borrowing from.

RH: Sankaran, your experience is in both composing and performing, since you have performed with Nexus and World Drums, and also composed for Western groups.

SANKARAN: My experience has been different from Suba's. One thing is that I feel I have the responsibility of carrying on the thoughts of my guru, Subramania Pillai. I have an obligation to maintain and preserve that tradition. My advice to others is to be strong in your own tradition whether it is jazz, classical, or whatever. Don't try to deviate at such an early stage. At the same time, I feel I can take the material of my guru and show different dimensions to establish my own style. The masters also believed in that. "You follow my path, but you should be your own person." That's what I have tried to establish, and people really understand that.

My compositions dealing with Western classical music, gamelan, and other types have given me some unique experiences in combining music and learning to orchestrate and structure the music. For example, Steve Reich's composition, *Music for Pieces of Wood*, prompted me to write my piece, *Catch 21*. I was influenced by the way he introduced rhythmic fragments and how I could develop them into making a *tala*. Some of the African rhythms have influenced me, too, and I have learned how to convert those into the Indian way. I may take an African bell pattern such as the one used in *Atsiagbekor*, and play it in *tisra*,<sup>9</sup> in a pulse of three instead of four. Some people may recognize the connection and some people may not.

In my scholarly writings, or in my presentations at conferences, I never fail to point out to my own audience, "Don't think that

*sankirnam* is exclusive to Indian tradition. *Sankirnam* is nine. Have you heard Turkish music?” I really like taking something from other places and bringing it back to India. Of course, I have taken many things from India. This kind of give and take I really like, otherwise we live in our own world and think we are the greatest on the earth. There are equally great people in other cultures, and we have to acknowledge that.

RH: Suba, have you played in India with Autorickshaw?

SUBA: Yes, but not for the classical audience. We have played in rock venues, folk festivals, a jazz festival, but not classical.

SANKARAN: I wonder if Autorickshaw would be welcomed by the Madras Music Academy. One thing is that the members of the Academy may not understand what Autorickshaw is doing. Come to think of it, we really need traditional societies like those represented by classical Indian music. What if everybody changed? There would be no charm in it. That’s why I think we should maintain traditions as they are, and for what we are.

SUBA: I was just thinking, to add to this idea of how we approach fusion, something you said about the conversion from African to Indian, cultural conversion. The other side of that perspective is what I like to call the “connecting of the cultural dots.” When I’m creating some sort of hybrid, I’ll think of the salient elements of that particular culture’s music, and see if there are any connections. For me, the most obvious one is Indian music and jazz, especially due to the scope of each for improvisation. Then you go a little deeper and you’ve got three-time tags in jazz and you’ve got *moras* in South Indian music. Go even deeper than that and you have what we call the *pallavi* line or the repeated line. In popular music we call it a chorus or refrain, or the head in jazz. For me it was really fascinating when I started examining this, I thought, “Oh, these are basically the same thing.” Growing up in a culture straddling East and West, to me everything is what we call “same thing, but different.” It’s just a different way of looking at it. A different name you put on the same thing. For me, that connecting of the cultural dots was really important when it came to fusing different styles of music.

SANKARAN: When we talk about the influence of Indian drumming on Western percussion, something that is very fascinating is the study of *solkattu*, which used to be only a part of our *mrdangam* learning. Those who specialized in it were called *konnakol* performers, and that art is mostly gone now, for one reason or the other. One of my interests is to revive the art of speaking *solkattu*, and that has worked out beautifully in the academic situation. The students learn rhythms and develop their rhythmic skills without having to learn drum technique. That is the advantage of this approach: anybody can learn *solkattu*. Now *solkattu* is a part of many ensembles. If you look at the film industry in India, they use

*solkattu*, for example, to depict a fight between father-in-law and son-in-law.

*Solkattu* can be taken as an entertaining art. It can be used for developing rhythmic skills like I did in developing rhythmic pedagogy and as a part of compositions. It can also be compared to scat singing in jazz or even beat-boxing. Now we have students who are researching the history and development of *solkattu* because it is the study of a whole different language: drummer's language.

RH: You have been talking about the advantages of *solkattu* in pedagogy. Can you both talk about ways you think the study of Indian rhythm could be utilized in Western music education?

SUBA: I think there are some disconnects in the Western upbringing. You have children doing their hand-clapping games that teach them to multi-task and divide their attention between clapping and speaking rhythms, but they are not taught to maintain this ability in their music education unless they learn Orff or Kodaly or something like that. So as they get older, they lose that ability, and then later it is imposed on them in a way that isn't really friendly. What I mean by that is the way they learn to speak certain rhythms by saying *ta ta, ti ti* is not actually ergonomically friendly inside the mouth. Whereas *solkattu* is actual instructions for a drummer in how to play, and it is ergonomically friendly in the mouth so that you can become fluent in this new language. Also you can build up the speed so it almost sounds like a stutter. When I work with school music teachers, and my father has done this as well, and introduce them to Indian *solkattu*, they abandon the old way they teach their rhythms in favor of *solkattu* because it's just the obvious choice.

One of the percussionists my father and I have worked with, Glen Velez, has incorporated frame drumming and walking patterns and his own hybrid version of *solkattu*. I have also taken *solkattu* exercises and added walking patterns. I eliminate the frame drum aspect of it so that it is just body, hands, and voice so the rhythms are really internalized. For example, I will do a slo-mo version of say, *rupaka tala*, with just *ta ki ta* exercise using the principle of doubling and isolating it so you get three-against-two and four-against-three. Then I do a forward and back simple walking pattern so that people can feel exactly when their body is centered. Then they can get a sense of how the rhythm floats on top of what their body is doing – bringing back that idea of divided attention. I never really understood what undivided attention meant when my kindergarten teacher said, "I want your undivided attention." It was only when I learned how to do the divided attention of the *solkattu* exercises or South Indian singing or improvising, that I realized, "Oh, that's what they meant!" That's the example that I use when I explain dividing attention or multi-tasking.

SANKARAN: To develop that further, *solkattu* is useful from simple counting to remembering the most complex compositions. When they used to say *one e and a, two e and a* in Western music, now they are saying *ta ka di mi, ta ka di mi*. Because these are simple percussive syllables, they don't mean anything else in terms of language, just a drummer's language. They don't have any other meaning, these *ta ka di mis, ta di gi na thoms*, and *ta ki tas*, so anybody can use it, once they develop it. Of course, having said that, it's not that easy to develop the fluency of doing *solkattu*, but gradually they can improve. Counting is so important in Western tradition, so you really need to have a useful system. If you believe in the system and experience it in your mouth and body, it will really help you.

I also compare *solkattu* to the North Indian system of *bols* – both are beautiful. Again, they come from a different language. The North Indian Hindi language uses more aspirated sounds, more like Sanskrit – like *dha din din na, tha din din na*. Also the Hindi approach to speaking rhythms is slightly different from the Karnatak style. The North Indian *bols* can elongate a syllable, and they are more lyrical. The South Indian syllables have a strong attack quality, so you can experience more precision with *solkattu*.

RH: Are *solkattu* based on Tamil?

SANKARAN: Yes, Tamil, not Sanskrit. But we have borrowed some sounds from Sanskrit: *ta dit ta jem*. Those syllables are really decorative syllables, and they come from Sanskrit. Those who want to go deeper into *solkattu* can also get into language technique; there is so much scope.

RH: Suba, in Autorickshaw, Ed Hanley plays *tabla*. How does this work for you combining music from North and South Indian music with jazz?

SUBA: The genesis of the idea or the core concept usually comes from Ed, then I will get him to teach me the North Indian syllables. But for me to learn them, I will sometimes do a South Indian translation just so I can internalize it in my body and my hands and my mouth. And then I'll learn the North Indian syllables which I find a little more difficult because they are not my first language, and they have a slightly different flow. Ed has studied with my father, so he is very conscious of the differences between North Indian and South Indian rhythms and the syllabic languages. He has also translated some of the South Indian compositions for *tabla*. It's very different sounding from the *mrdangam* even though there are similarities in the two. Or I'll compose something and I'll say, okay this is more like a *ta di gi na thom* kind of phrase, and he'll say, "well we don't really have that on the *tabla*." It doesn't have quite the same sound when you say it with North Indian *bols*; similar, but not the same. Also, Dylan does beat-boxing, very standard issue Western style beat-boxing, emulating the drum set. So we'll sometimes have a three-way percussion battle of the bands where I will recite in *solkattu*, Ed will imitate my rhythms on the *tabla*, and Dylan will respond by beat-boxing, or as he calls it "drumming with his face."

SANKARAN: So it's really a question of adaptation. I have students who are adapting *kanjira* and *mrdangam* compositions to drum set. The challenge is that you can't really emulate the sound of the *mrdangam* on the drum set, so you are going more for the rhythmic values. And yet, for the sake of fluency and the way you want to play a *ta ka di na thom*, you have to distribute your strokes, whether you put it on a high-hat or tom-tom, or bass drum; you have to create your own legend. These are the challenging things when it comes to adaptation. So you take rhythmic values as a compositional element without attempting to imitate *mrdangam* sounds exactly.

RH: I just have one more question. Did you have any reservations when Suba decided to pursue Western music? Did you have hopes that she might become a professional performer of Karnatak music?

SANKARAN: Honestly, deeply rooted in my tradition I would really have wanted one of my children to take to this music very seriously; but of course she has taken it seriously. At the same time I think what we have developed is world music happening in our home. I don't know how we did that but we have an open mind to learn and appreciate other music and not just dwell in our own culture saying, "Well, we are the greatest." So we are very happy that she is doing Western music. Still my wish is that she shows more interest in Karnatak music. Her forte is more into jazz fusion, but my doors are always open. That wish is always there, but I'm really happy and proud of what she is doing. There's no regret at all.

RH: She's gone in new directions and is definitely "her own person."

SANKARAN: I'm sure Suba realizes that it takes extra effort to specialize in one thing, and I know she could have done it if she wanted. Maybe just to get a little bit philosophical, I think the general trend now is overall education – a broader education – not just specializing in one thing. And this holistic approach to learning and to teaching is so important. From that respect, I think she is doing really well and, to some extent, me, too. I should also thank my wife, Lalitha, for taking care of the basic education of my daughters, an education that really started at home. I'm thankful to god to have a family like this.

## Notes

1. Karnatak is often spelled Carnatic.
2. In this chapter, I will follow Indian tradition and refer to Trichy Sankaran by his last name, Sankaran. Trichy is the name of the town in southern India where Sankaran was born.
3. *Solkattu* (*sol* = syllable, *kattu* = bunch, group) is the system of South Indian rhythmic solfege. "Syllabic concept is the

foundation for all musical concepts and precepts in the Indian musical system. *Akshara* (syllable) is the basic unit of thought and perception. Musical ideas are conceived and expressed in terms of syllabic structures, memorized by an indigenous system of solmization. These become the encoded form, word-formulas for the metric-syllabic

structures.” T. Sankaran, *The Art of Konnakol (Solkattu)* (Toronto: Lalith, 2010), p. 1.

4. *Nadai* in Sanskrit, or *gati* in Tamil. “Flow; the number of subdivisions per *akshara* (see note 3) or beat.” These subdivisions are generally 3, 4, 5, 7, or 9 (see note 9). Sankaran, *The Art of Konnakol (Solkattu)*, p. 119.

5. *Tala* is “a rhythmic cycle consisting of a certain number of beats, shown through codified hand gestures, according to traditional practices.” Sankaran, *The Art of Konnakol (Solkattu)*, p. 120.

6. *Korvai*: “Literally, ‘strung together.’ A cadential form in which different phrase-

patterns are strung together.” *Mora*: “A cadential form which is marked by repeating a phrase or pattern three times.” T. Sankaran, *The Rhythmic Principles of South Indian Drumming* (Toronto: Lalith, 1994), p. 162–63.

7. *Mora*: see note 6.

8. *Rupaka tala* is a rhythmic cycle of three beats (sometimes viewed as six beats).

9. *Tisra* is one of five *jatis* that represent five basic lengths of rhythmic units:

*Tisra jati* – 3; *Chatusra jati* – 4; *Khanda jati* – 5; *Misra jati* – 7; *Sankirna jati* – 9.  
Sankaran, *Rhythmic Principles*, pp. 20–1.

## 18 African influences on Western percussion performance and pedagogy

B. MICHAEL WILLIAMS

### Introduction

As a percussionist, I am usually in the back of the orchestra playing instruments such as the snare drum, bass drum, cymbals, tambourine, triangle, timpani, or xylophone. Many years ago, I realized that nearly all these instruments in some way have their origins on the African continent. This realization led me on a quest to discover more about our percussive connection with Africa. What I found was a thread running throughout recorded history (and indeed beyond), an African continuum that is as much a part of every percussionist's heritage as the twenty-six standard rudiments of drumming. Prototypes of the earliest percussion instruments made their way into the European orchestra through the Turkish Janissary tradition (quite possibly via Arabic trade routes into North and West Africa long before recorded history), becoming standard instruments of the ensembles during the later years of the eighteenth century. Initially utilized to add color or an exotic flavor to the orchestral sound palette, percussion music found a creative foothold with the introduction of the percussion ensemble in the early twentieth century. Inventive composers such as Edgard Varèse and Amadeo Roldán, followed by Henry Cowell, John Cage, Lou Harrison, and other members of the "West Coast School," used conventional, ethnic, and "found" percussion instruments to greatly expand the possibilities of creativity in the era of early avant-garde experimentalism. These composers not only began to employ the instruments of African and other cultures, but utilized some characteristics of those cultures' rhythmic and tonal languages as well. As percussionists and composers sought direct contact with African musical sources, awareness of specific African musical elements (such as polyrhythm, call and response, and interlocking voices) made their way into compositions for percussion, exemplified particularly by the works of Steve Reich and other "minimalist" composers.

Roughly concurrent with the development of the Western orchestral percussion section and its eventual expansion into the modern percussion ensemble, the African diaspora was influencing the musical development of the New World in Cuba, Brazil, and the United States.

These diasporic influences would develop into genres such as rumba in Cuba, samba in Brazil, and jazz in the United States. Virtually every popular musical expression draws from African musical sensibilities and influences.

There are connections between the rudimental drumming tradition in North America (via Europe through the Janissary traditions) and the vocabulary of patterns employed in African drumming improvisations. Certain Africanisms such as groove, style, feel, voice, inherent pattern awareness, and “three-dimensional listening” can make a case for the study of traditional African music as a part of standard percussion pedagogy as we encourage our students to learn to “hear with African ears.”

### Orchestral origins

Antecedents of modern orchestral percussion instruments abound in Africa. The Moroccan *bendir*, with its single snare running across the underside of the head, is quite possibly an ancestor of the medieval *tabor*, which developed into the modern snare drum. In Ghana, the Dagbamba play a snared bass drum called *gungon* (see Figure 18.1),



Figure 18.1 *Gungon*.

with a curved stick in one hand and other hand bare. The main rhythms are executed with the stick hand, while the bare hand fills in gaps with embellishments at the top edge of the drum skin. In 1555, Pierre Belon described a similar technique of a Turkish Janissary musician playing a large drum called *davul*: “. . . the right hand, holding a curved stick, plays accented beats while the left, holding (a thin switch), plays more rapidly.”<sup>1</sup> Most scholars agree that the kettledrum originated from the Arabic *naqqarah* or *nakers*, although there are several examples of kettle-shaped drums throughout Africa. The medieval triangle developed from the ancient Ethiopian *sistrum*<sup>2</sup> with its trapezoidal shape and jangling iron rings attached to the lower rung.<sup>3</sup> Similarly, the modern tambourine has its ancestry in the Egyptian *riqq* and other prototypes from North Africa.<sup>4</sup> The marimba and other instruments of the xylophone family originated in Africa as well, although some scholars have hypothesized an Indonesian influence.<sup>5</sup>

Much of this discussion is purely conjectural, as most scholars have agreed that the Janissary instruments that eventually made their way into the European orchestra had Saracen (Muslim) origins or came from the East and that Islamic music had a particular influence on West African instruments and musical expression.<sup>6</sup> It is entirely possible that the musical influences traveled both ways by ancient trade routes from Africa through the Near and Middle East, as written accounts from European travelers on African soil did not occur until the European Renaissance was well underway.

No one knows what the original Janissary music sounded like, and descriptions of musical instruments are sketchy until 1588 when Thoinot Arbeau published his manual on drumming and dance titled *Orchésographie*.<sup>7</sup> James Blades lists the full complement of percussion instruments employed by the Janissary as consisting of “numerous pairs of cymbals, small kettledrums, triangles, tambourines and one or more Turkish crescents (*chapeau chinois*).”<sup>8</sup> Two famous early examples of the implementation of Janissary percussion in the orchestra are Haydn’s “*Military*” *Symphony No. 100* (1794) and Beethoven’s *Symphony No. 9* (1823), both scored for bass drum (in Haydn’s case with both stick and switch), cymbals, and triangle.<sup>9</sup> What these composers sought in these new sounds was added color, along with a touch of the exotic. Steven Schick explains:

In his Ninth Symphony, Beethoven doubled the advantage of percussion. He used it to create a vivid dance-like variation of the famous melody in the last movement. And further, by borrowing the perfumed percussion sounds of the cymbals, triangle, and bass drum from exotic Turkey, he managed to spice up an otherwise straightforward orchestration. Beethoven, not above dressing up yesterday’s ideas with a splash of color, was a composer who knew how to accessorize.<sup>10</sup>

## Advent of the percussion ensemble

The twentieth century ushered in a wealth of new sounds and rhythmic settings with the arrival of the percussion ensemble. The two earliest works for percussion ensemble, Roldán's *Ritmicas V and VI* (1930) and Varèse's *Ionisation* (1931), opened the door for a new generation of composers waiting in the wings and eager to develop the new genre with the inclusion of noises and indigenous instruments from a variety of cultures. Roldán's work, scored for a variety of traditional Afro-Cuban percussion instruments, reflected the African folk roots and rhythms of his native Cuba.<sup>11</sup> Varèse's composition presented an explosion of new sounds and noise aggregates to inspire the new generation.<sup>12</sup> Both of these seminal works inspired a group of composers, dubbed the "West Coast School," who revolved around the guidance of Henry Cowell. These composers (including Cowell, John Cage, Lou Harrison, Gerald Strang, Ray Green, and William Russell) began exploring music for modern dance inspired by their "interest in combining elements of non-Western music with modern Western compositional techniques."<sup>13</sup> Cowell's New Music Society began publishing scores in the quarterly *New Music*, which first appeared in 1927. In 1933, Cowell published Russell's *Fugue for Eight Percussion Instruments* and Varèse's *Ionisation*. In 1936, he issued six more works.<sup>14</sup> Cowell had categorized his growing collection of percussion compositions chronologically into four "schools," one of which arose from "direct experience with primitive percussion rhythms," particularly citing the works of modern Cuban composers such as Roldán and José Ardévol, who were "in close contact with the native Afro-Cuban music."<sup>15</sup>

Cowell introduced both Cage and Harrison to music of various world cultures through his course, "Music of the World's Peoples." Cowell's book, *New Musical Resources*, influenced Cage to enter the field of music. "That was important to me," Cage said, "to hear through him music from all the various cultures; and they sounded different. Sound became important to me – and noise is so rich in terms of sound."<sup>16</sup> Cameroonian musician and writer, Francis Bebey, expressed a similar sentiment to Cage's in describing music from Africa:

There is still a lingering notion that noise and music are incompatible. . . .

The African musician does not merely attempt to imitate nature by means of musical instruments; he reverses the procedure by taking natural sounds and incorporating them into his music.<sup>17</sup>

Although Cage and Bebey are discussing two different cultural expressions, both points of view agree. What Cage and the other composers of the West Coast School sought to achieve was a redefinition of what was acceptable

as music in the twentieth century. Noise and sounds of other cultures intertwined in the earliest manifestations of the percussion ensemble. Cage and his West Coast cohorts experimented with found sounds such as automobile brake drums and thunder sheets, but they also employed indigenous instruments from various world cultures in order to make noise available for use as a musical resource. According to Schick,

Finally, after more than a hundred years of development, percussionists were standing near the front of the line for acknowledgement and respectability. Then Cage, Edgard Varèse, and Henry Cowell came along with their revolution and greeted this newfound respectability with a brick to the head. . . . Early works for percussion ensembles were much more than just music; they were also social phenomena rising from a growing fluidity of cultural boundaries and new models of immigration in the New World. . . . Cage and his fellow revolutionaries were voicing concerns that we think of today as globalism, futurism, and individualism in the guise of polycultural noise constructions as early as the 1930s.<sup>18</sup>

### **Steve Reich and *Drumming***

During the 1960s, in reaction to the rigidity of serialism, a number of composers began paring down musical resources and borrowing certain elements (including rhythm, harmony, and in some cases instrumentation) from simpler popular genres as a kind of dialogue between “cultivated” and “vernacular” expressions.<sup>19</sup> Steve Reich was at the forefront of this movement, along with such notables as Terry Riley and Philip Glass. The repetitive rhythms and simpler, cyclic chord progressions reminiscent to some degree of blues, jazz, and early rock music provided some of the flavorful seeds for what became known as minimalism or process music. Reich had been attracted to popular songs, jazz, and bebop styles as a teenager and his early musical language drew to some extent from this African-American infused music.<sup>20</sup> The next generation of minimalists (or “post-minimalists”), including such composers as David Lang, Julia Wolfe, Evan Ziporyn, and Michael Gordon, continues to follow Reich’s and other minimalists’ lead in blurring the lines of demarcation between art music and popular expressions.

Reich’s work stands out for a number of reasons. He studied drumming as a teenager and was familiar with the rudiments of drumming, so his compositions had a percussive quality about them without the familiarities of the earlier percussion ensemble music of the West Coast School. He had heard recordings of African drumming and read A. M. Jones’ book, *Studies in African Music*, in the early 1960s while a student at Mills College and those

experiences influenced his earliest works for tape loops. Later, in 1970, Reich traveled to Ghana to study Ewe drumming. *Drumming* incorporates the interlocking patterns derived in some ways from African drumming and combines them with the technique of phasing multiple unison canons with different rhythmic positions taken from his earliest tape works.<sup>21</sup> He was able to accomplish this in live performance because he surrounded himself with highly accomplished professional musicians (in contrast to the unschooled percussionists who realized Cage's earliest works) who shared his affinity for rhythm, groove, and what might be termed "pop," or at least "non-academic" sensibilities.<sup>22</sup> Concerning the African influence on *Drumming*, Reich wrote,

The effect of my visit [to Ghana] was basically *confirmation*: that writing for acoustic instruments playing repeating patterns of a percussive nature was a viable means of making music, and had an ancient history. Thus, my visit to Africa did not directly influence my piece *Drumming*. That piece was mostly the result of my having studied drumming when I was 14 with Roland Kohloff. My studies of Western drumming as a teenager together with my undying attraction for percussion and my discoveries of phase shifting with short repeating patterns led to the composition of *Drumming* in 1971. The influence of African music on my composition really had happened much earlier in 1963 and '64, and from that point, as an influence, it diminished.<sup>23</sup>

What Reich valued most was finding his own voice within a somewhat African-derived structure of polyrhythmic interlocking patterns. Out of respect for African musical tradition, he rejected early the notion of employing authentic African instruments in his work.<sup>24</sup> While Reich clearly downplays direct African influence on *Drumming* and other works using similar procedures, the resultant patterns that emerge from the coincidence of multiple unison canons are strikingly similar to the inherent patterns of interlocking *mbira* voices in the Shona music of Zimbabwe and the Ugandan *amadinda* xylophone tradition. Still, the voice of *Drumming* clearly belongs to Reich.

### The African diaspora

The African diaspora runs deep in the music of the Americas. African musical expressions are preserved and transcended in the forms of samba and bossa nova in Brazil; rumba and salsa in Cuba; reggae in Jamaica; calypso in Trinidad; blues, jazz, rhythm and blues, and rock music in the United States, and so many others throughout the New World. African customs, myths, and music came to the Americas by way of the slave trade of 1619–1808. African slaves from Cameroon, Ivory Coast, Guinea, and Senegal were brought to New Orleans, while those from Angola, Congo,

Nigeria, and Ghana landed in Brazil. Other natives from Nigeria, Ghana, and Ivory Coast arrived in Cuba and Martinique, “bringing with them the African calls, variegated songs, and dance music that would sow, in a new land, the seeds that would blossom into an ever-unfolding extension and elaboration of their progenitors’ culture.”<sup>25</sup>

Having charted and analyzed over 2,500 songs from 233 indigenous African cultures, Alan Lomax notes a remarkable homogeneity of musical style on the African continent. He describes African singing styles as relaxed, cohesive, repetitious, overlapped, antiphonal, and polyrhythmic in accompaniment. “It dominates African song from the Cape of Good Hope to the Straits of Gibraltar and west into the American colonies, and is the source of African cultural homogeneity.”<sup>26</sup> The common stylistic thread that unites all African music, concludes Lomax, “is repetitious, cohesive, overlapping or interlocked, multi-leveled, and hot.”<sup>27</sup>

The foundational elements of African-American music include calls, cries, and hollers, call-and-response devices, additive rhythms and polyrhythms, heterophony, blue notes, bent notes, and elisions. Vocables and other rhythmic-oral declamations, interjections, and punctuations dominate singing expressions. Many of these vocal devices were incorporated into instrumental music. Offbeat melodic phrasings and repetition of rhythmic and melodic figures developed into riffs and vamps in jazz. In addition, timbral distortions of various kinds (both vocal and instrumental) and a metronomic sense underlie all African-American music.<sup>28</sup>

Africans throughout the New World attempted to continue their native religious practices involving drumming, dancing, and spirit possession ceremonies in neo-African cults. Cuba, Brazil, and other New World colonies eventually accepted and even embraced these activities and their accompanying drums, rattles, and bells. It was a different story in the United States, as John Storm Roberts relates:

The varying degrees of tolerance or hostility directed against neo-African cults had a direct effect on the black music of the New World. The African elements in U.S. music are far more transmuted than those of other parts, and there is no neo-African music such as found in the Caribbean and parts of South America. One reason, no doubt, is that contact with Africa was broken earlier, and another is that – compared at least with some parts of the Caribbean – the black population is smaller. Moreover, it is probable that the main African influence on the United States was from a tradition that could blend well with white styles. But the banning of drums in many parts of the country was certainly a factor, especially in the disappearance of the cults. . . . When the drums were silent, the old gods came no more.<sup>29</sup>

The southern plantations in America yielded the field hollers and ring-shouts that incorporated call and response into early spirituals. These vocal

styles merged into instrumental music and mixed with indigenous rhythms of drumming, as Floyd explains:

The banjo, flute, triangle, drum, quills, and sticks (bones) were ubiquitous in slave culture. It is not surprising to find that this combination of instruments is perfectly suited to the realization of the heterogeneous sound ideal. The combination of these sounds creates a contrasting, not a blending, conglomerate, resulting in a sound that is ideally suited to the rhythmic, polyphonic, and tonal stratifications of African and African-American music. . . . The ideal sound played a critical role in determining the nature of blues, ragtime, jazz, gospel, R&B, and all the other African-American musical genres, and it also influenced mightily the unique sound of American popular music in general.<sup>30</sup>

There is probably not a single popular musical form or style that is not somehow touched by African music. As the diaspora continued to unfold, instruments were adopted and adapted: from fiddles (both African and European) to the banjo (a distinctly African instrument), even in the hands of Appalachian “hillbilly” musicians.<sup>31</sup> In similar fashion, the drum set developed from the marching funeral bands of New Orleans following the Civil War in the gestation period of early jazz.<sup>32</sup>

### **Pedagogical considerations**

With such an abundance of African influences on current Western culture, it is incumbent on today’s percussion educators to address matters of African musical pedagogy with our students. I have always been a firm advocate of teaching all first-year students, no matter how advanced or experienced, the twenty-six standard drum rudiments. I explain to my students that these patterns are not only an excellent way to develop a solid percussion technique; musically speaking, they are part of every drummer’s ancestral heritage. I believe we owe it to our students to expose them to African music for the same reasons. The onomatopoeic verbalizations of standard patterns such as “flam,” “ruff,” “paradiddle,” and “ratamacue” mirror the various verbalized rhythms of African drumming and extemporized vocables in African singing styles. The earliest rudimental fife and drum pieces consist of similar kinds of “constant repetition of rhythmic and melodic figures and phrases” referred to by Floyd as foundational elements in African-American music.<sup>33</sup> Peggy Sexton makes a compelling case that the syncopated “flamacue” may have developed from an African origin. Othar Turner’s Mississippi Fife and Drum Band is a wonderful example of the synthesis of European-derived military music with African drumming roots, in which drummers employ improvisations filled with flamacue-derived rhythms bearing a distinctly Senegambian flavor.<sup>34</sup>



Figure 18.2 *Mbira dzaVadzimu*.

As is commonly prescribed by drum set pedagogues, I encourage my students to transcribe African rhythms from recordings as a way to “get inside” a particular soloist’s tone, feel, groove, phrasing, and improvisational style.<sup>35</sup> I also encourage them to *sing*, as there is no better way to internalize African concepts of pitch and phrasing. Of course, it is vitally important to bring in African teachers and authentic culture-bearers to add the richness of social contact and context to the learning experience whenever possible.

In addition to African *djembe* drumming of the Mande tradition of Guinea and Mali, many of my students also study the Zimbabwean *mbira* (see Figure 18.2). The study of this elegant and powerful instrument, a “cousin” of the marimba,<sup>36</sup> brings a completely new realm of listening experience to the entire percussion curriculum. Melody, implied harmonies, inherent rhythms or resultant patterns, polyrhythm, modality, cyclic recursion, and singing are all available through the study of this single instrument. I have found that studying *mbira* can change the way students hear the more conventional works they play on marimba, timpani, multiple percussion, drum set, and any of the standard instruments of the percussion section. Contemporary compositions abound with musical Africanisms, whether or not intended by the composer, simply because they have become part of our contemporary musical language.

The study of African music allows students to hear with “African ears,” to become aware that, as Berliner has related, “The music becomes ‘kaleidophonic.’”<sup>37</sup> In a typical forty-eight-pulse cycle of a traditional *mbira* tune may be found dozens of inherent patterns that often overlap and intersect, facilitating the discovery of a fascinating depth to this seemingly repetitive music. These patterns are also polyrhythmic, and their effects are multiplied when two or more players perform together in interlocking *kushaura* (leading) and *kutsinhira* (following or complementary) parts. I compare the sensation of hearing and discovering these inherent patterns to the effect of viewing a sculpture in comparison with a painting. The music can be perceived as three dimensional. There is no starting and ending point to this circular, repetitive music, and yet it is anything but monotonous. Once a student has grasped this listening concept, these perceptions can enrich the aural experience, adding depth of understanding to any musical expression. Not unlike the music of Steve Reich, *mbira* music requires clarity of focus and heightened perceptive awareness on the part of the listener in order to bring attention to what Dumisani Maraire calls “present but not obvious lines” created by the combination of interlocking patterns, cross harmonies, overtones, or the interweaving of other, unintended sounds.<sup>38</sup> Such musical economy of means makes for a satisfying aesthetic experience using only the barest of musical resources, opening our perceptions to the exquisite ambiguity of African music, reflective of the mystery of life itself. One can discover in this music the seeds of ancient musical genres that continue to develop in the twenty-first century.

Understanding the shared cultural heritage of percussionists worldwide is vitally important to our overall pedagogy. We need to know where our music comes from in order to grasp where it is going. At the very least, we can honor our musical ancestors by fostering in our students an awareness of the “long shadow of black ancestral traditions” through which artistic expressions are culturally reworked “in the jaws of modern experience.”<sup>39</sup> There is a rhythm from Mali called “Madan.” It is a harvest rhythm played on the *djembe* for the cultivation of fields. The rhythm employs the three characteristic sounds of the *djembe*: bass (b), tone (t), and slap (s) as follows:

|| : b.tt.bs. : ||

I call this rhythm “the Ringo beat,” the pattern Ringo Starr plays on the Beatles’ tune “Twist and Shout” and countless other early rock tunes. It is over 800 years old. I first heard it in 1964 and it made me want to become a drummer. I did not know at the time that this

simple, catchy rhythm would lead me back to my musical ancestors, and I am grateful to Ringo for bringing it to my attention. This simple rhythm connects us to Africa, and Africa is a powerful nexus of the percussive arts, a continuum that has indeed been with us all along embedded within a very deep heritage.

## Notes

1. H. Powley, "Janissary Music," in J. H. Beck (ed.), *Encyclopedia of Percussion* (New York: Garland Publishing, 1995), p. 196.
2. G. B. Peters, *The Drummer: Man* (Wilmette, IL: Kemper-Peters, 1975), p. 75.
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## 19 The gamelan beleganjur as Balinese percussion ensemble

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When my son and daughter were little, I took them to hear their first live performance by an orchestra: a dress rehearsal reading of Mussourgsky's *Pictures at an Exhibition* played by the Florida State University Symphony. My daughter Leah, three at the time, was very excited by the experience and wanted to tell her grandfather all about it. She grabbed the phone from me while I was speaking to him that evening. "Guess what we did today, Grandpa?" she gushed. "We went to hear an American gamelan!" And as far as Leah was concerned, that is precisely what we had done. Her percussionist/ethnomusicologist father, after all, was a Balinese gamelan director at the University. She had heard plenty of gamelan concerts in her young life, but nothing like this. Gamelan music was familiar; it was normal. The orchestra? Now *that* was something different.

### Gamelan orchestras?

Most readers of this chapter probably do not think of an orchestra as a type of gamelan, but it is likely that many do think of a gamelan as a type of orchestra. Indeed, we in the West have been routinely referring to gamelans as "Javanese orchestras" or "Balinese orchestras" for well over a century now, at least since the days when Claude Debussy famously alighted at the spectacle of Indonesian gamelan music performed at the 1889 Paris World's Fair.<sup>1</sup>

It makes no more sense to call an orchestra a gamelan than it does to call a gamelan an orchestra, but it makes no less sense either, and as I will endeavor to illustrate in this chapter, such cross-cultural frames of reference, shot through with egregious inaccuracies and essentialisms as they may be, offer gateways to rich and enlightening understandings of both the disparate musical traditions they enframe and the dialectical relationships that exist between those traditions. Analyzing orchestral repertoire through the use of concepts and procedures normally reserved for gamelan music analysis, for example, can reveal unique music-theoretical perspectives and insights, as is demonstrated in Michael Tenzer's gamelan-informed analyses of symphonic works by Lutoslawski and Ives.<sup>2</sup> In a different vein, the Javanese musicologist Sumarsam has theorized on how "exposure to Western modes of

thinking caused gamelan theories to develop along particular lines,” especially in relation to the ascription by Dutch colonial officials of “high culture” status to Central Javanese court gamelan musics in the nineteenth and twentieth centuries, that is, to a status category normally reserved for European symphonic music and the like.<sup>3</sup>

The conceptual fluidity of scholars like Tenzer and Sumarsam – their willingness to stretch beyond the conventional boundaries of relativistic propriety for the sake of drawing parallels between ostensibly unrelated musical and cultural traditions – largely accounts for the creative richness of their work and the instructiveness of its findings. It inspires new ways of thinking not just about gamelans and orchestras, but about the products and processes of musical experience most broadly conceived.

My purpose in this chapter is to achieve something similar, though from a very different point of view. It is to make gamelan music make sense in terms of Western musical and cultural sensibilities rather than in opposition to them and, moreover, to accomplish such sense-making with a majority target readership of Western percussionists in mind. Toward this end, I limit the scope of both the investigation and its project of cross-cultural analogizing in two related ways. First, the discussion focuses on a single type of gamelan, the Balinese *gamelan beleganjur* (see Figure 19.1), a processional ensemble that is comprised exclusively of



Figure 19.1 The *gamelan beleganjur*.

gongs, melodic gong-chimes, drums, and cymbals. Second, I avoid generically analogizing gamelans and orchestras, favoring instead an alternate mode of analogy that is both more specific and more accurate: the gamelan beleganjur as percussion ensemble.

Whatever else the gamelan beleganjur may be – an emblem of Balinese cultural identity, an integral component of Hindu-Balinese ritual life, a forum for inter- and intra-village competition – it is indisputably a percussion ensemble as well. It lacks the string and wind instruments that are featured in many other forms of Javanese and Balinese gamelan and is thus an entirely appropriate medium for engagement in pure percussion ensemble terms. Adopting such an approach in the context of a volume like this one, geared as it is to percussionists and the percussively inclined, provides a rare and special opportunity to bridge the gaps of foreignness, exoticism, and esotericism that too often impede intercultural awareness, understanding, and empathy among and between the denizens of seemingly distant musical worlds.

## **The gamelan beleganjur as percussion ensemble**

If the gamelan beleganjur is a percussion ensemble, this begs the question of precisely what kind of percussion ensemble it is. To answer that question, we must consider the ensemble in terms of its material, musical, performative, and cultural elements, and also in terms of key functional roles, contextual settings, and aesthetic priorities with which it is associated in Bali.

### **Instrumentation**

The standard instrumentation of the gamelan beleganjur consists of two *kendang* (drums); eight pairs of crash cymbals (*cengceng*); two tempo-marking, hand-held kettle gongs called *kajar* (or *kempli*) and *kempluk*; another pair of hand-held kettle gongs called *ponggang* that furnishes the music's *pokok* (lit. “trunk” or “root”), or core melody; four smaller hand-held kettle gongs called *reyong* (or *bonang*), on which are played rapid interlocking figures that ornament the *pokok*; a medium-sized, flat-bossed gong, the *bendé*, which has a clangy timbre and plays syncopated figures; and two very large hanging gongs, the *gong ageng*, which together with the *kajar*, the *kempluk*, and a medium-sized hanging gong called the *kempur*, provide the music's foundational *gongan*, or gong cycle (colotomic) structure.

All of the instruments other than the crash cymbals are played with either padded beaters or yarn-wound mallets. The female (*wadon*) and male (*lanang*) *gong ageng* (lit. great gong) are typically played by a single performer, but there is a separate player for every other instrument in the ensemble:

one drummer each for the male (lanang) and female (wadon) kendang, eight cymbal players for the eight pairs of cengceng, four reyong players for the four reyong “pots,” and one player each for the two ponggang kettles, plus the kajar, kempluk, kempur, and bendé players. Traditionally, beleganjur musicians were always male (the majority being teenagers and young men), though beginning in the 1990s some women’s groups were established as well.<sup>4</sup>

As noted, the gamelan beleganjur is a processional ensemble, a Balinese-style drum line in essence. The processional order of instrumentalists may vary, but is always headed up by the two drummers. They are typically followed by two lines of cymbal players, one line of reyong players, and a fifth line of musicians playing the ponggang, kajar, and kempluk parts. Shoring up the rear is the gong section, with the bendé and kempur players on either side of the *gong* player.

The kendang are slung around the drummers’ necks on straps and played lengthwise with a mallet on the right-hand head and open palm strokes on the left. The reyong, ponggang, kajar, and kempluk are held in the players’ left hands and struck with mallets held in the right. The hanging gongs are suspended from thick wooden poles and usually transported on shoulder by nonplaying gong carriers. They are struck with very large padded mallets, except for the bendé, which is played with a thick, curved wooden beater.

### **Fundamental aspects of form and structure in traditional beleganjur music**

Compared to most every other type of Balinese gamelan, the gamelan beleganjur is conspicuously limited in its melodic range and resources. The entire melodic dimension of the music is confined to the two-toned ostinato core melody of the ponggang and the interlocking melodic elaborations of the reyong an octave above. Rhythm, tempo, cyclicity, and energy (*gaya*), rather than melodic development per se, are what primarily define the musical character and functional efficacy of traditional beleganjur music, that is, *beleganjur kuno*.

The core foundation of all beleganjur music is an eight-beat gong cycle (gongan) called either *gilak* or *tabuh gilak*. Each of the eight beats is marked by the steady “quarter-note” pulses of the kajar part, which are reinforced on every other note by the kempluk (if present – this is an optional beleganjur instrument). The first and fifth beats are marked alternately by the female and male gongs, with beats six and eight punctuated by the kempur. The clangy bendé fills in the rhythmic spaces with a syncopated ostinato rhythmic figure, usually the following one (- = rest; / = stroke):

1	2	3	4	5	6	7	8
-	//	-	//	-	//	-/	-/

The ponggang's core melody, the pokok, is also one eight-beat cycle in length. Beleganjur uses a four-note *pelog*-type scale consisting of the Balinese pitches *dong*, *deng*, *dung*, and *dang*, which are represented as pitches 2, 3, 5, and 6 in Balinese cipher notation, and which usually correspond roughly to the Western pitches D, E, G#, and A. The two ponggang are tuned to *dang* (A) and *dung* (G#) and perform the following melodic pattern repeatedly, in conjunction with the *gong* cycle:

1	2	3	4	5	6	7	8
dang	-	dung	dang	dung	dang	-	dung

All of the other instruments – *kendang*, *reyong*, and *cengceng* – typically play together at the music's highest level of rhythmic density – sixteenth-notes to the *kajar*'s quarter-note beat in most cases. Their continuous streams of sixteenth-note rhythmic motion are rendered by sets of interlocking patterns between the individual players. Sometimes these interlocks are created by straight on-beat/off-beat alternation of notes between two or more parts – basic hocketing, as it were. More often, however, the melodic/rhythmic figures that contribute to interlocking textures (known generically in Balinese gamelan music as *kotekan*, though alternate terminologies are used in different contexts) are more complex in structure.

In the case of the *cengceng* part, a set of three interlocked rhythms, the *kilitan telu*, are divided among the eight cymbal players. The basic rhythm of the set is called *megbeg* ||: / - / / - / / - :||. The two other rhythms are identical to *megbeg* but rhythmically displaced, with the one, *nyandet*, anticipating *megbeg* by a sixteenth-note

(/)||: - / / - / / - / :|| and the other, *ngilit*, following *megbeg* by a sixteenth-note

||: - / - / / - / / :||. These three rhythms together create a continuous stream of sixteenth-note rhythmic motion:

Kajar	: x - - - x - - - :
Megbeg	: / - / / - / / - :
Nyandet	: - / / - / / - / :
Ngilit	: - / - / / - / / :
Composite	: / / / / / / / / :

The same principle – and indeed the same types of syncopated rhythms – defines the structure of the majority of interlocking *kendang* and *reyong* parts as well. Thus, for example, a standard *gilak* interlock between the male and female drums would have the female (*kendang wadon*) playing ||: / - / - / / - / - / - / / - :|| while the male (*kendang lanang*) plays the “same” rhythm starting a sixteenth-note earlier:

(/)||: - / - / / - / - / - / / - / :||. Again, the resulting composite pattern fills in all the rhythmic space, yielding continuous sixteenth-note rhythmic motion:

Kajar	: x - - - x - - - x - - - x - - - :
Kendang wadon	: / - / - / / - / - / - / / - :
Kendang lanang	: - / - / / - / - / - / / - / :
Composite	: / / / / / / / / / / / / / / / :

The reyong parts work in essentially the same way, but with the added complexity of integrating a melodic element into the interlocking texture. In the example below, note how each time pitch 6 (dang, or “A”) is struck, pitch 2 (dong, or “D”) is played as well, creating a Balinese harmonized sonority of *empat* (lit. “four”). The notes that fall between these syncopated dyads alternate between pitch 5 (dung, or “G#”) and pitch 3 (deng, or “E”).

Kajar	x      x      x      x      x      x      x      x
Reyong	: 6 5 6 3 5 6 3 6 5 3 6 5 3 5 6 3 5 6 3 5 6 5 3 6 5 3 6 5 3 6 5 3 6 5 3 :
	: 2   2      2   2      2      2      2      2      2      2      2      2      2      2      2 :

## Beleganjur kuno in the context of ritual cremation processions

The gamelan beleganjur acts as a quintessentially functional ensemble in Hindu-Balinese ritual processions. Its designated purpose is to serve the ritual needs of the occasion rather than to satisfy any explicitly artistic or aesthetic objectives. One of the two drummers, usually the player of the male (lanang) drum, is the ensemble leader. It is his job to regulate the pace and energy of the procession by translating processional needs into percussive sounds, into music that facilitates the meeting of key ritual requirements and aspirations.

Of all the processional ritual contexts in which beleganjur music is performed, the one with which it is most closely identified is the *ngaben*, or Hindu-Balinese cremation, procession. Performing cremations for its members is the principal responsibility of every Balinese *banjar*, the village wards or neighborhood organizations that form the bedrock of Balinese society. Ngaben processions may include multiple – sometimes dozens – of deceased individuals, or they may involve just one. The following discussion focuses on the latter type.

During ngaben processions, the gamelan beleganjur is typically situated immediately behind the *wadah*, the tall cremation tower that bears the body or exhumed remains of the deceased. Its music serves several

important functions. First, it is believed by the Balinese to have the power to frighten and literally deflect *bhuta* and *leyak* evil spirits, whose nefarious endeavors include attempts to capture the *atma*, or soul of the deceased, and drag it down to the dreaded Lower World of the Balinese cosmos. The battles of human ngaben participants against their evil spirit adversaries enlist beleganjur sound as both weapon and shield: on the one hand, the music is used to startle and “strike” the bhutas and leyaks, fostering fear and inflicting injuries that deter them in their malicious pursuits; on the other, it forms a protective shield around the tower and the precious *atma*, a sonic force field that should ideally prove impenetrable.

This may not be enough, however, so additional measures are taken to ensure ritual success in the desired liberation of the *atma* from its earthly bonds and its ascent to the Upper World of gods and deified ancestors to await reincarnation. Bhutas and leyaks are believed to congregate in greatest abundance at crossroads along the procession route. These crossroads are, therefore, the most dangerous locations for soul loss, necessitating extra vigilance and strategic effort on the part of the *atma*'s human allies. The tower is spun around a minimum of three times at every crossroad. This is done in order to confuse the evil spirits who gather there, since they are thought to have the ability to travel in straight lines only. Concomitant with the ritual spinning of the tower is an abrupt change in the beleganjur's musical style at these points. The lead drummer cues a dramatic rise in tempo as the cymbal players switch from their *kilitan telu* interlocking sixteenth-note patterns to a more driving rhythmic texture called *malpal*. The *malpal* rhythm features half of the cymbal section performing on-beat quarter notes while the other half answers with off-beat eighth-notes. This simpler interlock generates a steady, propulsive stream of eighth-notes rather than sixteenth-notes, and it is played as loudly as possible. The use of *malpal* at crossroads serves several interconnected purposes, energizing and strengthening the carriers of the heavy tower to spin the *wadah* quickly and decisively, heightening the capacity of the music's sound to terrify and ward off the swarming bhutas and leyaks, and emboldening the *atma* to be courageous even in the face of impending danger.

This last function of the beleganjur ensemble, both at crossroads and elsewhere along the procession route, is of crucial importance. The very same beleganjur sonic force that wreaks havoc on the meddlesome efforts of bhutas and leyaks is also thought to imbue the departing *atma* with the courage and strength needed to commence and successfully pursue its perilous afterlife journey. The beleganjur must do its part, for if the *atma* succumbs to fear, it is likely to try to escape from the tower and return to the native banjar as an unliberated soul. There, frustrated and in perpetual limbo, it will haunt and taunt the villagers ad infinitum for failing in their

ngaben efforts, potentially bringing about a host of serious problems, from illness and disease to drought and famine.

Finally, it is the responsibility of the gamelan beleganjur to establish, modulate, and maintain the proper mood and energy of the procession overall. Cremation processions can quickly devolve into anxious events since so much is at stake. An elusive balance of buoyancy and restraint on the part of the individual ritual participants and the collective super-organism they together form in this decisive moment of *communitas* must be achieved to ensure that all goes according to plan, leading to the desired outcome of the *atma*'s ultimate safe passage to the Upper World. The beleganjur-dominated soundscape becomes like a ritualistic energy valve, the lead drummer its chief engineer. He must open and close the valve just the right amount at just the right times by shifting the tempo, dynamic level, mood, and texture of the music in alternately subtle and dramatic ways. There are times for the drums and cymbals to enter and times for them to exit (the gongs, by contrast, are played continuously from start to finish), precise moments to transition into and out of the *kilitan telu* and *malpal* passages, points at which the tempo and energy of the music must be eased back to counteract growing feelings of tension and anxiety, and others at which they must be ratcheted up to combat encroaching lethargy or complacency.

A purely music-analytic assessment of a beleganjur *kuno* performance will not reveal all that much in the way of formal or structural musical complexity, let alone innovation. With rare exception, the gong cycle is always *gilak*, the core melody always the same *pokok*, and the interlocking figures of *reyong*, *cengceng*, and *kendang* quite uniform. Textural contrast is mainly limited to sections of the performance when the drums and cymbals are played and those where they are not, and between the relatively relaxed *jejalanan* musical styles played during most of the procession and the more intense *malpal* style of the crossroads.

This predictable uniformity of style accounts for the quality of malleability that is so essential to beleganjur's functional value as a music of ritual procession. It allows for the performance to be continually shaped and crafted to the exact requirements of the ever-emerging moment, rather than being confined to the inflexible structural and formal demands of a predetermined composition and arrangement. Indeed, one of the main complaints levied against many beleganjur groups today is that they have forsaken the traditional *kuno* style of old in favor of the flashy newer styles of *kreasi beleganjur*, even in ngaben and other ritual contexts where the *kreasi* style is patently inappropriate. It is to this very different contemporary style that we now turn our attention.

## **The contest style: kreasi beleganjur**

Beleganjur has always been a music of battle: spiritual battles between human beings and their evil spirit adversaries in ritual contexts like the ngaben; beleganjur-accompanied earthly battles fought by the royal armies of warring Balinese kingdoms in olden times; and, for the past three decades, the symbolic battles of *lomba beleganjur*, or beleganjur contests, in which rival groups compete before panels of judges and large audiences for trophies, money, prestige, and bragging rights.

The *lomba beleganjur* has roots in both the beleganjur kuno tradition and a series of intercultural musical developments dating back to 1979, the year of the inaugural Bali Arts Festival (Pesta Kesenian Bali) in Bali's capital city, Denpasar. The festival opened with a grand parade through the streets of the city. The music, that year and for the next four, was provided by large, Western-style marching bands.

In 1984, I Made Bandem suggested that a “genuine Balinese marching band” of some type would be more appropriate for the parade. This resulted in the formation of a giant *drumban* (drum band) called Adi Merdangga, Sanskrit for “Number One Drum.” It employed a hundred musicians and twenty dancers. The instrumentation included sixty *kendang* of all sizes, dozens of hanging and melodic gongs, and a huge *cengceng* section. The music drew liberally upon many different styles of Balinese gamelan, as well as from Western marching band music, but its musical foundation was resolutely beleganjur.

Two years later, in 1986, a weeklong ceremony commemorating the eightieth anniversary of the Puputan Badung was held in Denpasar, the present-day location of the former royal palace of the Badung kingdom. The Puputan Badung took place on September 20, 1906. It was on that day that the kingdom fell to Dutch colonial forces. Rather than surrender, the king, his family, and thousands of loyal subjects committed puputan (“death before surrender”), taking their own lives with sacred daggers or marching directly into the line of enemy fire in enacting a “heroic and distressing mass ritual suicide.”<sup>5</sup>

The 1986 ceremony was to commemorate the heroic martyrdom of the fallen and to conflate the heroic, *kepahlawanan* spirit of the puputan with the modern, patriotic ideals of the Indonesian nation. A committee including the great Balinese composer I Ketut Gedé Asnawa was formed to plan the commemoration. They decided that a grand music contest should be the capstone event, and, inspired by the popularity of Adi Merdangga and the long militaristic past of beleganjur itself, determined that a contest featuring modernized beleganjur music performed by groups hailing from banjars throughout the Denpasar/Badung region would be the perfect fit.

Asnawa was assigned the role of primary architect of the beleganjur contest event and the exciting new style of beleganjur music that it would showcase. He fashioned a formal set of criteria for evaluating contest performances that essentially prescribed the invention of a neo-traditional genre: kreasi beleganjur – “creative beleganjur” or “new creation beleganjur.” This was to be a music built upon the same foundations as its traditional, beleganjur kuno counterpart: the eight-beat gilak gong cycle, kilitan telu cymbal rhythms, ostinato core melody of the ponggang, and characteristic patterns of kendang and reyong interlocking. Beyond adhering to these shared root elements, however, kreasi beleganjur took off in an entirely new direction right from the start. Displays of breathtaking ensemble virtuosity and technical brilliance replaced functional purpose and efficacy as the music’s *raison d’être*. Elaborate choreographic sequences performed by the musicians as they played, *gerak*, became central to an aesthetic of showmanship and bravura. Colorful, matching costumes replaced the customarily drab attire of ceremonial beleganjur groups. The compositions and arrangements were formally complex and highly sophisticated, with a standard fast–slow–fast, three movement formal plan replacing the relatively simple with-drums-and-cymbals versus without-drums-and-cymbals alternating textures of kuno styles.

Within movements, too, works unfolded through a series of markedly contrasting *pukulan*, or variations, highlighting the various instrumental sections of the beleganjur ensemble in sequence and grafting source materials from myriad Balinese musical genres – as well as from other popular Indonesian styles such as West Javanese (Sundanese) *jaipongan* and even Western genres like funk and hip-hop – onto the music’s core gilak base. This was music that prized novelty and innovation, flash and panache, wit and whimsy, and it was music created and performed with one guiding set of motivations in mind: to impress the judges, excite and enthrall the audience, and win the top prize.

Kreasi beleganjur was also a restless music that refused to sit still. Taking its cue from the well-established competitive traditions of the *kreasi baru* (new creation) repertoire of the *gamelan gong kebyar*, it became a cauldron of perpetual change and one-upmanship as rival groups tried to outdo one another year after year. By the early 2000s, some groups were straying so far from the original musical style and its associated cultural values that pioneers like Asnawa were inclined to essentially disown the genre, at least in its most radicalized incarnations.

As composers, arrangers, and ensembles looking for a competitive edge – or just excited by the music’s open-ended possibilities – experimented with new gong cycles, breakneck tempos, stunning displays of interlocking complexity, radical textural variety (e.g., having the gong cycle

drop out for entire formal sections), pop music borrowings, odd meters, and satirical and sometimes subversive gerak routines, kreasi beleganjur became at once an explosive domain of artistic invention and a polarizing emblem of contemporary Balinese cultural expression.

## Conclusion

The world of the gamelan beleganjur offers a revealing lens through which to view the myriad complexities and paradoxes of Balinese musical life, as well as its profuse vitality and resilience. I define ethnomusicology as “the study of how people make and experience music, and of why it matters to them that they do.”<sup>6</sup> Exploring beleganjur as the musically unique and culturally situated percussion ensemble tradition I have endeavored to evince here offers rich opportunities to engage in ethnomusicological inquiry so defined.

Many questions and issues related to those addressed in the foregoing discussion extend beyond the scope of this chapter: What accounted for the surprising emergence and quick decline of women’s beleganjur in the 1990s?<sup>7</sup> What can we learn from the experimental adaptations of beleganjur music into genres as diverse as Balinese avant-garde music,<sup>8</sup> jazz (e.g., I Wayan Balawan), and heavy metal (e.g., Mr. Botax)? To what factors might we attribute the growing popularity of beleganjur among North American, East Asian, and European gamelans in recent years? How might ethnomusicological ways of thinking about beleganjur open our ears and attune our minds to new ways of conceptualizing other types of percussion ensemble music, whether of drum lines and new music groups or taiko ensembles and steelbands?

Such questions take us outward from the core of the Balinese beleganjur tradition per se, but we might just as productively move inward toward deeper structure interpretations. By way of conclusion, I venture a small step in that direction.

When I was working toward the completion of my first book, *Music of Death and New Creation: Experiences in the World of Balinese Gamelan Beleganjur*, I happened upon an unfamiliar word in my Balinese-English Dictionary: *dih*. Two definitions were provided. One defined *dih* as “the main strip of material in basket-weaving, the main thread in weaving cloth”; the other as “self, [or] person . . . [or as] one person (of two).”<sup>9</sup>

My unanticipated encounter with this intriguing word, *dih*, brought a flash of insight that sent tingles up my spine. It seemed to capture, in its polysemy and metaphorical reach, a poignant answer to the question of why so many of the Balinese musicians I had known and played music with made

music as they did, as well as why it was so important and meaningful for them to do so. For them, I surmised in my new light of dihi awareness, the experience of making music in the intricately interactive and interlocked ways that Balinese gamelan performance requires was to embody an experience of becoming that main thread in the weaving of a cloth, that main strip in the weaving of a basket. It was to realize one's self by dissolving into the larger fabric of a communal musical/social ideal, to become whole by becoming an indistinguishable yet integral part of the whole.

As for evidence in support of my hypothesis, I need look no farther than the perfectly wrought web of interlocking rhythms that comprise the kilitan telu, through which a single rhythm, made manifest in three tightly bound variants separated from each other by the minute imitative distance of a single sixteenth-note, could be transformed into a sonic cascade of perpetual rhythmic motion. This was an infinitely strong sonic fabric whose threads were all in the right places, indeed, to the point that one did not perceive those threads individually at all anymore.

To conceptualize the kilitan telu as a manifestation of dihi – the self, the main thread – is, I think, to cut to the core of what makes a great beleganjur performance groove so hard, contain so much power, and make such good community. It extends from there to other realms of Javanese and Balinese gamelan music and much further as well, suggesting a quality of experience that I would contend defines the essence of ensemble music-making at its sublime best regardless of genre, culture, or context. Viewed from such a perspective, the notion of listening to a gamelan as an orchestra, or an orchestra as a gamelan, seems not only plausible, but positively enticing.

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PART SEVEN

**Percussion and rhythm**



## 20 Lessons from the laboratory

The musical translation of scientific research  
on movement

MICHAEL SCHUTZ

From our first lessons focusing on the direct relationship between movement and sound quality to explorations of gestures' theatrical possibilities, physical movements have long fascinated percussionists. Scientific study of the topic has recently shed light onto the psychological underpinnings' of movement's musical uses. Although I now recognize this research's clear practical value, in my student days I mistakenly viewed "music research" as largely disconnected from my goals as a percussionist. My initial experiences in graduate school did little to challenge this perspective, with mandatory courses on library usage and lengthy written exams covering topics seemingly removed from my interests as a performer. However, a project focused on the perceptual implications of marimbists' physical movements challenged my perspective, dramatically changing my performing, teaching, and even thinking about music. Consequently, I began striving to balance my time between research and performance, finding that my efforts in one area informed and improved my work in the other.

Throughout this chapter, I will discuss scientific research on musical movement – with a particular focus on movements lacking acoustic consequences. While these studies vary in the immediacy of their application, all ultimately provide valuable insight. In this sense, the study of music cognition is analogous to that of music history: although some aspects are less immediately applicable, a broad understanding is helpful in becoming a well-rounded musician.<sup>1</sup> My specific aims in writing this chapter are twofold: first to emphasize technical scientific studies' practical value for performing musicians, and second to encourage musicians to think about new research questions and topics growing organically out of their personal experiences. As powerful research tools become increasingly widespread, the potential for harnessing their use grows dramatically. Consequently, there has never been a better time for curious musicians to begin exploring the psychological basis of our art.

## Music and body movement

As percussionists, we regularly face the importance of understanding physical movement. Renowned timpanist Fred Hinger's emphasis on the relationship between physical movement and sound quality<sup>2</sup> continues to influence many of today's leading percussionists. In addition to small movements of fingers and wrists, larger motions are required when playing drum set, marimba, timpani, and multiple percussion – not to mention merely arriving at the proper instrument in complex setups! Some composers have elevated physical movement to an art in its own right. Jennifer Stassack explores silent movements in her marimba solo *Six Elegies Dancing* (1987), and Thierry de Mey employs them to great artistic effect in *Musique de Table/Table Music* (1988). This issue is far from “new” – John Cage's *Living Room Music* (1940) touches on these issues to some extent by encouraging performers to creatively employ a variety of movements for reasons extending beyond their acoustic consequences. However, recent interest in “theatrical percussion” takes this relationship to a new level and is discussed at length in Aiyun Huang's article, “*Percussion theater; the drama of performance*” (Chapter 9 in this volume). My chapter supplements growing musical interest in this topic by exploring its scientific roots – *how and why* silent movements shape the musical experience. I am focusing on silent movements in particular as their role is counterintuitive, and also as acoustically consequential movements have understandably received more previous attention.<sup>3</sup>

Although rarely discussed in scientific terms, performers have long intuitively recognized movement's importance independent of its acoustic consequences. Steven Schick noted aptly that “physicality and gesture in percussion music are powerful tools of communication” and that “anyone who has ever attended a percussion concert can tell you that the experience of percussion music involves the eyes as well as the ears.”<sup>4</sup> Although percussionists perhaps deal most directly with the consequences of extra-acoustic gestures, we are not alone in this matter. Composer Robert Schumann once famously remarked of a well-known pianist that “he must be heard – and also seen; for if Liszt played behind the screen, a great deal of poetry would be lost.”<sup>5</sup>

Here I will summarize the latest scientific research on musical movement in two distinct sections. The first focuses on implications of *feeling our own* movements with respect to our perception of timing. The second explores the results of *seeing others' movements* when evaluating performances. Together, I hope this discussion will provide insights for composers, teachers, and performers. Although my focus is primarily on work relevant to percussionists, many of these issues apply equally as well to other musicians.

## **Feeling movement: moving to the beat affects timing perception**

When I first joined the percussion faculty at Longwood University in rural Farmville, VA, I frequently found myself coaching students through challenging repertoire by demonstrating the movements I would use to perform certain passages. Initially intended merely to provide a demonstration, dialogue about why I used certain movements led to some interesting introspection. On more than one occasion, I found myself unconsciously using gestures that were not strictly “necessary” for sound production. These movements were spontaneous, and although they “seemed helpful” I began wondering if this were actually the case – after all, at one point using a death grip to ensure my mallets didn’t slip “seemed helpful.” Many musicians move to the beat while playing or even listening – are such non-sound-producing movements musically useful? Musicians have recognized links between movement and rhythm for generations, and scientists have recently begun explaining the psychological and neurological bases for this connection.

One study presented participants with a six-beat sequence of snare drum and slapstick notes. Lacking accents, the sequence was created to be metrically ambiguous and could be interpreted as being in either 3/4 or 6/8 time. While listening, participants mimicked the bouncing motions of an experimenter moving either two or three times per grouping. When bouncing three times, participants were essentially moving in 3/4; when bouncing twice, they were moving in 6/8. Subsequent evaluations with acoustic accents added on every second or third note sounded more similar to the ambiguous rhythm when it *aligned with their previous movements*. In other words, moving while listening altered their understanding of the sequence’s structure.<sup>6</sup> Although movement’s effect could in theory reflect culture-specific associations, a parallel study using seven-month-old infants suggests it is innate.<sup>7</sup> Head movement, rather than movement of other body parts, is the essential driving force.<sup>8</sup>

This documentation of links between movement and timing perception complements parallel explorations of brain structure. Neural areas tasked primarily with motor control respond when listening to rhythms – even when the listener is not moving.<sup>9</sup> While neuroanatomy is “compartmentalized” with certain areas more active in some tasks than others, the degree of cross talk between distinct areas is significant. It is no more possible to ignore the feel of one’s movement when listening than to read the letters D-O-G without recognizing they refer to man’s best friend. Movement’s effects on our perception of ambiguous stimuli raises intriguing questions as to whether we can use such findings strategically. Although body movement *changes* our interpretation, can it *improve* our listening abilities?

### **Movement improves timing perception**

To explore whether movement can be “helpful,” researchers created a series of simple metronome-like sequences lacking metrical context (i.e., a stream of quarter notes with no rhythmic variation). They then removed certain notes to make the underlying pulse ambiguous. All participants moved their fingers while listening to this ambiguous sequence, but half were asked to tap their feet prior to this finger movement (the others listened without first tapping their feet). Foot tapping aided extraction of the underlying pulse, presumably by clarifying the tapper’s perception of the beat within ambiguous sequences.<sup>10</sup> This suggests that movement may be helpful when extracting pulse from rhythmically complex passages. It also raises an intriguing question – beyond assisting with a subjective task such as beat extraction, can body movement *objectively improve* our listening abilities?

To explore this question, Fiona Manning (one of my graduate students) is working with a paradigm designed to quantitatively measure movement’s effect on perception. Our approach uses customized software producing MIDI sequences while simultaneously recording participants’ tapping on electronic drum pads. The task involves listening to a simple five-measure pattern with three measures of quarter notes in 4/4 time followed by a measure of silence. Participants then hear a *probe tone* on the downbeat of the fifth measure, “probing” their perception of the downbeat. The probe tone occurs at the correct time (i.e., right on the beat) on half of the trials and is off by a slight amount on the other half – roughly a sixteenth note or thirty-second note early/late. Participants indicate whether this tone is correct and tap on half of the trials. We ask them to listen without moving for the rest. Participants are better at detecting the probe tone’s timing when tapping along as opposed to listening without movement.<sup>11</sup> This demonstrates that movement can objectively improve rhythm perception. Although intriguing, we then began wondering whether it is the movement itself that improves rhythm perception or instead the *acoustic results* of the movement (i.e., hearing one’s own taps).

Pinpointing the exact source of movement’s improvement required separating the feel of tapping from its acoustic consequences. However, as anyone who has attempted to silently pick up/set down a tambourine during quiet passages recognizes, silent movements are not always feasible! Unable to make the taps “silent,” we masked their sound using white noise – the static heard when tuning a radio between stations. Additionally, participants wore foam earplugs inside their headphones, blocking the sound of their tapping without obfuscating the MIDI wood-block sequence. Although they performed better when hearing as well as feeling their taps, the movement benefit persisted even when the taps were

masked.<sup>12</sup> This shows that movement alone can improve rhythm perception, an insight useful when performing and/or listening to rhythmically intricate percussion music. The effects of movement documented in these studies were found in participants who were not selected for musical training, consistent with the idea that auditory-motor connections are innate or “hardwired.” Nonetheless, the role of training is an important one to consider, and it consequently compelled a series of studies involving percussionists.

Our interest in training’s effect arose in part from the opportunity to work with the percussion ensemble TorQ in preparation for the 2012 McMaster University *Neuromusic Conference*. As the event alternated between discussions of my team’s research and TorQ’s energetic performances, we tested the ensemble prior to the concert and showed their results as part of the event. Unsurprisingly, they were excellent tappers! Their performance in the experiment raised questions regarding the role of percussion training in auditory-motor interactions, and consequently Manning brought a team of students to the University of Toronto and University of Western Ontario to test their percussion studios. Additionally, through a partnership with the PAS Scholarly Research Committee and with funding from the Petro Canada *Young Innovator Award*, we were able to bring the MAPLE Lab to PASIC in 2013 and 2014, testing over one hundred percussionists in a series of experiments. These studies revealed that percussionists benefit more from movement than those without musical training.<sup>13</sup> To some extent, this reflects that percussionists are (predictably) good tappers. Curiously, however, percussionists did not outperform non-percussionists in the *absence of movement* – a surprising finding whose potential implications are currently being explored.

### **Seeing movement: silent movements affect musical evaluations**

In addition to listeners’ movements affecting their own perception, the movements seen by audiences can affect their hearing of the music – even when acoustically irrelevant. Scholars formally exploring performers’ movements distinguish between two broad categories of gestures: *effective* and *ancillary*. Effective gestures are required for sound production – such as the downward motion used in striking a drum. Their acoustic relevance distinguishes them from ancillary gestures – movements more excessive than acoustically required. Elaborate sweeps of the arm after striking an instrument, head movements assisting with timekeeping in complex passages, and even rhythmic breathing are, in an acoustic sense,

“unnecessary.”<sup>14</sup> Yet, they are regularly employed in performances, often to great effect.

Research on musical movement has blossomed in recent years, to the point where it is possible to synthesize multiple findings through a technique known as a “meta-analysis.” This approach aggregates disparate results to summarize a large body of work. A meta-analysis including fifteen studies exploring visual influences on ratings of “overall quality,” “liking,” and “overall impression for performance evaluation” found that watching a performer’s body movements had a consistent influence on ratings of their performances.<sup>15</sup> This formal quantification complements other reviews of the many ways in which vision affects evaluations of musical expressiveness,<sup>16</sup> which range from high-level attributes such as “performance quality” down to low-level properties such as timbre, pitch relationships, and volume.<sup>17</sup>

One challenge inherent in understanding the psychological basis for ancillary gestures’ effects is designing studies capturing the full complexity of musical performances while yielding strong conclusions. One of music’s endearing qualities is its complexity and variation, and no two performances are exactly the same. Although this variation makes music interesting, it poses unfortunate challenges for reproducibility and control – factors crucial for scientific progress. Simplifications of musical material can be helpful in designing experiments affording strong conclusions. However, this approach can make it challenging to determine whether conclusions drawn from such passages apply to realistic musical material. Therefore, a full understanding of performers’ ancillary gestures requires a range of studies employing multiple approaches. In some cases, experiments conducted in realistic circumstances provide provocative suggestions, even if they defy clear conclusions. Alternatively, studies using constrained excerpts can be helpful as they offer convincing demonstrations of particular phenomena. Personally, I have found both approaches helpful in clarifying my understanding of how music “works.” And in fact, it was through discussion of this kind of issue that I began my own journey into exploring music’s psychological basis.

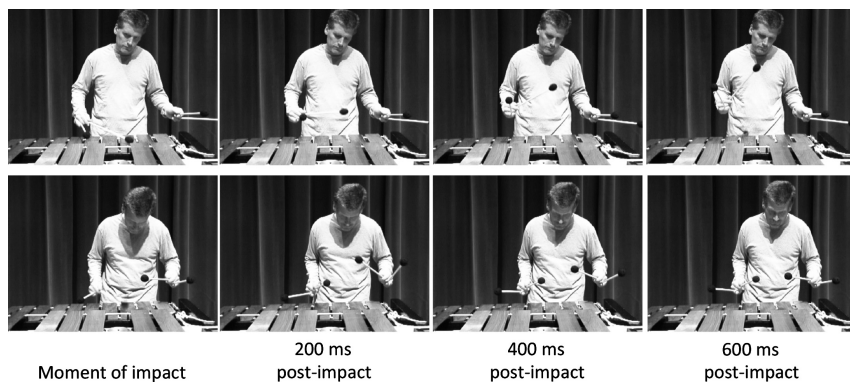
### **Hearing gestures, seeing music**

During one of my lessons as a graduate student at Northwestern University, Professor Michael Burritt suggested I use more demonstrative motions in order to “shape the audience’s listening experience.” I naively protested that such movements were not part of the “true music” as they play no role in audio recordings. (I had not yet learned about research on ancillary gestures!) After all, this use of acoustically inconsequential motions seemed curious given our typical fixation on economizing

motion. Upon further reflection, I began wondering if certain movements could be musically relevant despite lacking acoustic consequences. After all, “unnecessary” movements are pervasive. In fact, videos of my own playing documented that I myself frequently employed such gestures – despite my protests at the time as to their musical relevance! To clarify, I began a “controlled” project based on recordings of attempts to create marimba notes differing in duration. While single-note excerpts are a far cry from most recitals, this constrained scenario afforded exploration of a long-running musical debate: whether it is possible to create “long” and “short” notes on the marimba.

This experiment featured renowned marimbist Michael Burritt, who employed both “long” and “short” striking motions. His long gestures featured a flowing movement with a graceful “bounce” after impact, whereas short gestures ended abruptly.<sup>18</sup> My colleagues and I then asked musically trained participants to judge the durations of the resulting notes. Our key manipulation was switching the notes in half of the videos, pairing the long striking motion with the sound produced by the short motion, and vice versa. Despite instructions to judge the duration of the sound alone, visible gesture length significantly altered duration ratings. Furthermore, when judged in the absence of the gestures, evaluations of the notes produced by long and short gestures were indistinguishable. This documents that although long and short gestures do not affect the sound of notes produced on the marimba, they do affect *the way these notes sound* within the mind of the listener.<sup>19</sup> Subsequent studies demonstrate that it is specifically the post-impact motion that controls an audience’s perception of musical note duration<sup>20</sup> and that this illusion is similar even in those without musical training.<sup>21</sup> I described the psychological processes giving rise to this illusion in my first *Percussive Notes* article on this project<sup>22</sup> and the specifics of the motions involved in my second.<sup>23</sup> Videos from these experiments are also available freely in a review published in *Music Theory Online*.<sup>24</sup>

I chose a “controlled” approach to exploring the role of gestures in order to arrive at strong conclusions regarding vision’s influence on music perception. While this approach holds many benefits, it is admittedly based on simplified musical material – a single note! Therefore, I see it as complementing other approaches using recordings of complete compositions or at least prolonged passages. One such study used silent videos of a percussionist playing Goldenberg’s *Melodic Study in Sixteenthths*<sup>25</sup> – aptly identified by researchers as “neutral in emotional nature.” The marimbist attempted to convey four different emotional intentions: anger, happiness, sadness, and fear. Participants watching silent videos depicting the movements without sound were able to consistently discern the performer’s



**Figure 20.1** Time-lapsed images from Schutz and Lipscomb study showing long and short striking motions. Captured 200 milliseconds apart, the images show that acclaimed percussion soloist Michael Burritt’s striking mallet (held in his right hand) continues moving for longer after impact when using a “long” flowing gesture (top) than a “short” choppy gesture (bottom). This difference in post-impact motion changes our *perception* of the tone’s duration, even though it does not affect the tone’s *acoustic* duration. To see an animated version of this figure (and download demonstrations for personal/educational use), please visit [www.maplelap.net/illusion](http://www.maplelap.net/illusion).

emotional intentions. Manipulations using only portions of the video (i.e., removing the hands, showing only the head) were generally also sufficient. However, removing head movements reduced recognition of the performer’s emotional intentions.<sup>26</sup> Although this approach establishes that vision is capable of *conveying meaningful information*, it does not comment on whether this information *affects auditory evaluations*. However, this kind of question has been explored by percussionist/psychologist Dr. Mary Broughton.

Broughton is a professional percussionist who also earned a PhD in Experimental Psychology and now draws on this dual background to formally study marimbists’ body movements. One of her investigations involved asking participants to rate their level of interest and the level of “expressivity” exhibited in excerpts of popular solos such as *Marimba Dances* (Edwards), *Suite for Marimba* (Yoshioka), *Nancy* (Séjourné), and *Merlin* (Thomas). Broughton recorded these excerpts in two styles – either “expressive” (similar to an actual performance) or “deadpan” (with expressive aspects kept to a minimum). Participants rated these performances after hearing either audio-visual or audio-alone versions. They were in fact adept at detecting the expressive versus deadpan performance styles – however, only when watching as well as listening.<sup>27</sup>

This type of approach involving multiple performances of basic repertoire offers a “realistic” exploration of performance practices. Furthermore, it shows that differences in intention are both visible and can affect ratings of audio-visual performances.<sup>28</sup> As such, this design

provides insight into ancillary gestures' effects on musical evaluations. At the same time, it does not afford disambiguation of the different performance intentions' visual and acoustic consequences. The expressive and deadpan conditions differ with respect to both body movements and the acoustic results of these movements (i.e., both effective and ancillary gestures). Consequently, other studies using tightly constrained excerpts provide an important complement to these approaches as they afford stronger conclusions.

One such investigation explores whether vocalists' facial expressions affect audience perception of their singing. Here, participants rated silent videos of a professional vocalist singing intervals ranging from a minor second to an octave. Participants were able to correctly recognize the relative sizes of the sung intervals from merely watching these soundless excerpts.<sup>29</sup> Subsequent studies built on this result by including an auditory component, pairing the facial expressions with different pairs of sung notes – either major or minor thirds. Here, rather than interval size, participants judged their emotional quality, building on differences in the emotional connotations of major and minor thirds in Western music. Singers' facial expressions changed evaluations of their sung intervals, providing strong evidence that they not only convey musically relevant information, but this information *affects evaluations* of sound.<sup>30</sup>

This work involving pairs of sung notes bears similarity to my own involving single marimba notes – both use constrained musical examples and tightly controlled procedures to arrive at strong conclusions. As musical performances generally involve more complex material, other approaches using longer excerpts hold certain advantages. Yet, the complexity of using “realistic” videos simultaneously precludes the manipulations of auditory and visual components required to reach unambiguous outcomes. Eliminating sound entirely allows for the use of more involved examples,<sup>31</sup> but introduces different challenges with respect to practical applications. Fortunately, methodological diversity is a bedrock principle of scientific exploration, as examination from multiple points of view helps in triangulating truth. And curiously, recent technological developments build on and affirm both approaches by using alternative representations of human movement affording new explorations.

### **Threading the needle: new approaches to balancing realism and control**

Humans are adept at recognizing complex movements from surprisingly sparse representations. White dots tracking key locations (i.e., shoulder, elbow, hand, foot) against black backgrounds are effective at modeling many complex movements. In fact, movies such as *Avatar* use this approach to create compelling models of human motion. These models

appear curiously “realistic” given that they portray fictitious creatures never previously seen! In addition to their use in entertainment, these displays have a long history of aiding movement research,<sup>32</sup> including explorations of music<sup>33</sup> and dance.<sup>34</sup> I used a variation of this technique to create a “virtual marimbist,” which served as an eerily accurate surrogate for an actual performer in some of my previous work.<sup>35</sup>

New extensions to this well-established technique offer powerful opportunities for balancing realism and control, as the sparse nature of point light representations affords manipulations preserving natural appearances. For example, “time warping” involves subtle changes in movements, allowing for rendering different versions of human avatars that remain realistic in appearance. In one intriguing approach, pianists played Chopin’s *Prelude in E minor* with different degrees of expression – including “deadpan” (i.e., reduced expressivity), “normal” (i.e., typical expressive), and “exaggerated” (i.e., maximum possible expressivity). Pairing each time-warped movement sequence with each audio recording created visually identical but acoustically distinct (as well as acoustically identical but visually distinct) audio-visual performances.<sup>36</sup> Experiments using these hybrid audio-visual excerpts demonstrated a clear visual influence on performance evaluations of musical expressivity.<sup>37</sup> Because these animations used acoustically identical passages paired with different motions, they provide strong evidence that ancillary aspects of gestures can *alter evaluations* of concurrent acoustic information.

In an approach equally relevant to performing musicians, a different study explored the degree to which body movements provide insight into the winners of prestigious musical competitions. Six-second videos of finalists’ performances were presented as either audio-visual, video-alone, or audio-alone clips. These excerpts showed violinists and pianists performing in high-stakes venues such as the Van Cliburn International Piano Competition and the International Tchaikovsky Competition. The overall level of playing was extremely high, and participants in the audio-alone and audio-visual conditions failed to perform better than chance at identifying competition winners. Curiously, only those watching *silent videos* performed better than chance! These results were robust across different assessments, and replicated even when using highly trained musicians as evaluators.<sup>38</sup>

Although many visual clues were available in videos, follow-up studies suggest that gross body movements played a crucial role. Silhouettes obfuscating facial features and smaller movements while preserving larger gestures again afforded predictions of the ultimate winners; however, still images did not.<sup>39</sup> Extensions of this paradigm involving ensemble performances in the Saint Paul String Quartet Competition and Fischoff

Competition suggest this phenomenon is not limited to solo performances.<sup>40</sup> Although further research is needed to determine the precise aspects of the performers' gestures contributing to this outcome (i.e., ancillary vs. effective), the use of material from important competitions means these results hold significant practical implications.

### **Concluding thoughts and future opportunities**

I have summarized a variety of movement studies pertinent to our work as musicians. My hope is that this knowledge will not only help performers, teachers, and composers, but that it might also encourage musicians to propose and pursue new research questions. Given the growth in tools and training programs, there is now tremendous potential for curious musicians to make important discoveries. Personally, I have found insights from this research not only fascinating, but also musically useful. When students in my percussion ensemble are struggling with certain rhythmically intricate passages, I am able to explain to them that moving while performing can help their efforts to keep time. Additionally, arranging setups so that my students can see one another often helps them to better align their performances. When puzzling through transcribing or simply listening to complex rhythms, I now tap along, improving my ability to extract the beat and recognize rhythms.

Knowledge of how performers can shape an audience's listening experience through the proper use of ancillary gestures is invaluable in striving to ensure they contribute toward our musical goals. Such movements can be helpful communicative tools in recitals and competitions, unscreened orchestral auditions, and live performances in a variety of ensembles – as audiences' attention is often disproportionately drawn to the percussion section (and for good reason!). I also find knowledge of gestures' perceptual effects helpful in explaining to students that effective performance is less about technical flash and faster tempos than the communication happening between performer and audience.

Scientific studies of musical communication can be pursued in a variety of different manners. After completing my Master of Music in Percussion Performance, I took the somewhat unusual step of pursuing a PhD in Experimental Psychology rather than the more typical path of enrolling in a Doctor of Musical Arts program. This decision helped me to develop the skills required for running my own research laboratory – which now allows me to explore a variety of musical issues. However, this is not the only way to become involved in scientific research on music, as scientists are often eager to collaborate on projects of mutual interest.

For example, Roger Chaffin's group at the University of Connecticut has pursued novel explorations of practice and memorization techniques employed by professional pianist Gabriela Imreh.<sup>41</sup> This partnership proved quite fruitful, and he subsequently studied issues of memory in realistic practice and performance scenarios through partnerships with cellist Tânia Lisboa<sup>42</sup> and vocalist Jane Ginsborg.<sup>43</sup> Both Lisboa and Ginsborg now blend performance and research activities as part of their professional portfolios. Therefore, collaborations hold great potential for enhancing dialogue between the artistic and scientific communities and represent the epitome of interdisciplinary research trumpeted by universities. Musicians interested in exploring such opportunities may wish to consult the Society for Music Perception and Cognition map of researchers and facilities at <http://musicperception.org/smpc-resources.html>.

In conclusion, there are many ways in which psychological research can inform and inspire musical activities. I believe the importance of understanding music cognition parallels the importance of understanding more traditional subjects included in music curricula, such as musical harmony. A firm understanding of basic principles of music theory as presented in undergraduate textbooks provides useful insight into the structure of actual symphonies and solos – even though in practice “rules” are not always followed as cleanly as in the classroom. Similarly, controlled studies can be helpful in probing the general principles employed in processing more complex musical material. Although it is possible to recognize “moving to the beat” helps timekeeping without knowledge of the cognitive basis for this insight or that ancillary gestures on stage affect performance evaluations without an understanding of cross talk between neural areas processing sight and sound, understanding the cognitive basis for these phenomena only improves our understanding of music – and the musicians giving it life. Sound only becomes music within the mind of the listener, and consequently understanding music's psychological basis provides significant benefits for all who perform, teach, compose, and enjoy this important human endeavor.

As the field of music cognition grows, I am excited about the possibility of experimental psychology's powerful techniques to explore musically motivated questions, complementing music cognition's traditional focus on using music to explore psychologically motivated questions. As musicians, we possess finely tuned intuitions cultivated from a wide array of musical experiences, which hold the potential to lead organically to exciting new research questions. Such interdisciplinary explorations hold significant and far-reaching benefits, helping us inch closer to a fuller understanding of the surprising ways movement can be used to create more effective musical performances.

## Notes

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## 21 In the beginning was the beat

### Evolutionary origins of musical rhythm in humans

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Every known culture has music with a sense of pulse, or beat, that organizes time, enlivens our bodies, and can enable groups of people to move in time in dance, music-making, or work.<sup>1</sup> There can be a sheer joy in coordinated action with others, and pulse in music is one vehicle for achieving this. While the basic idea of being able to perceive and move in time with the pulse of music may seem simple, this simplicity belies a rich complexity of central interest not only to musicians, but also to scientists of many stripes. The underlying neural mechanisms are fascinatingly complex, providing insights into how the brain shapes our reality and connects sensation with movement, while its evolutionary origins are matter of vigorous speculation and ongoing debate.

So, when and how did the beat begin? The universe is full of repeating patterns of light and dark, ebb and flow, swinging to and fro, and this is the milieu for all life. For organisms to be able to track *and predict*, for example, the coming of day or night has adaptive value, and synchronization with the light/dark circadian cycle is observed throughout nature. Most organisms create other rhythms of their own, of locomotion, breath, and heartbeat.

Despite the pervasiveness of oscillation and entrainment in the world, the ability to synchronize motor output to auditory input as humans do when dancing, performing, or just tapping a foot along with music turns out to be extremely rare in other animals, something Fitch has called the “paradox of rhythm.”<sup>2</sup> There are at least two levels to this rareness: the first is basic, and often noted, that the presence of a neural link by which auditory pattern perception can influence motor pattern generation is necessary for synchronization with sound, but this link appears not to be present in most animals. It enables basic sensory motor synchronization (SMS), but this does not encompass human rhythmic capacities. It is thought that in humans this auditory/motor link is bidirectional, opening rich possibilities for an internal sense of beat to affect not just how we respond to the world of rhythm, but how we actively perceive it.<sup>3</sup> We will call this capacity rich beat perception and synchronization, or rich BPS, which we suggest is a second key development responsible for our rhythmic abilities. Highlighting the distinction between basic SMS and rich BPS

is important for understanding the origins of human musical rhythm, for it emphasizes that multiple steps were likely involved. The distinction between these is not always made clear in the literature, and the majority of comparative and evolutionary accounts have focused on basic SMS, while rich BPS has not yet been demonstrated in any other animal to our knowledge.

In this chapter, we will focus on a deeper origin question, asking what are the forces that shaped our ancestors to have these capacities? Frankly, it's an odd thing, to link sound and movement as we do. Adding a deep interest, remarkably, synchronized action often leads to deep feelings of bonding and oneness between individuals. Did the beat evolve because it had survival value for our distant ancestors? Is it a by-product of our complex emotional and social brains or an invented technology for pushing our minds in pleasurable or even useful ways? We cannot know for certain. Our tangible view of the past is quite limited, with the earliest musical instruments, bone flutes, found dating from only 40,000 years ago, indicating that tonal music at least was well under way in our Paleolithic ancestors.<sup>4</sup> Nonetheless, there is a wide range of other evidence to draw from in creating theories of the origin of musical rhythm, including behavioral and neuroscientific studies of rhythm perception and production in humans, a comparative look at other animals to see what aspects of rhythmic behavior they may share with us, and why, and studies of other cultures as a way to peel back our technological and cultural developments to glimpse how music and dance may have played a role in societies of the past.

### **Rich beat perception and synchronization: a view from cognitive neuroscience**

First, what are we actually trying to explain? Here is a cognitive scientist's perspective, which may seem basic and familiar to a percussionist but with some differences in terminology and formulation. It can be boiled down to this: rhythmic patterns of sound are "out there" in the world; the beat is entirely "in here," a creation of our minds. Temporal patterns of acoustic energy exist in the world. Our brains are able to find regularity and thereby form predictions about the future of these patterns, predictions that influence our perception and action. Sound patterns become rhythms *only* through an interaction with our brains: what can be predicted from a given signal is a property of the perceiver, not the signal. Just as different frequencies of light become colors only by interacting with an eye and brain – the colors we see are very different from that of a bee – so it is with

rhythms: their periodicity is something we must be able to engage with. Consequently, much of our work in the cognitive science of rhythm is aimed at explaining our capacities for prediction in terms of internal mechanisms.

### **Beat-based perception**

It has long been known that for humans when temporal patterns have, at least loosely, certain temporal properties, such as having note durations related to each other by simple ratios, or having some degree of periodicity or repetition, they can induce in us a pulse that enables a special form of temporal perception, beat-based perception.<sup>5</sup> This central human mode of rhythmic engagement involves the induction, from rhythmic input, of a continuous sense of periodicity or *pulse* (termed “beat” when reinforced by a periodic train of sonic events). A pulse can exist at multiple hierarchical levels, and all levels need not be isochronous (evenly timed), though often at least one is. The pulse tempo need not be metronomic, but can have a certain elasticity, although different levels often track each other (except, e. g., in music built incorporating multiple tempos phase slipping across each other – something that has not been much examined by science). While we can use the pulse hierarchy to organize the timing of our movements, the pulse also plays a central role in perception: one might say that the musical sense of rhythmic pulse forms a recurrent scaffold upon which time perception is organized. The timing of events is perceived relative to our internal pulse. In this way, an acoustically identical note can be perceived in very different ways: upbeat, downbeat, offbeat, afterbeat make no sense except in relation to an internal pulse through which they gain different perceptual identities and different performance realizations. Beat-relative perception also aids memory for patterns. Critically, the pulse is not slavishly determined by sound, but is something we can, to varying degrees, control: when we listen to highly syncopated rhythms, we can still “find” and tap our toes to the pulse of the music despite the complex sequence of note durations, many not beginning “on the beat.” Conversely, we can generate highly syncopated rhythms on an internal pulse. When the internal pulse is shared among a group of performers, they can coordinate their perception and production of rhythm. We will present below a conceptual cataloging of increasingly complex features that comprise rich BPS and distinguish it from mere SMS, keeping track of which features have and have not been demonstrated in other animals.

### **Basic sensory motor synchronization**

Modern scientific studies of rhythm perception and production have been under way for well over a century.<sup>6</sup> The most basic level and the

canonical paradigm for most of our work so far is 1:1 SMS with isochronous sounds, where people move once for each sound. Most humans, even without any explicit musical training, are extremely good at this in the sense of matching the average tempo of their movement (often finger tapping) with a metronome within a few percent. Two observations point to the *existence of an internal pulse*. First, synchronization is not a reactive process, but instead a predictive and anticipatory one – synchronized movements often precede a metronome, and the movement initially synchronized to a metronome can continue when the metronome is removed.

Even simple synchronization with others has a strongly emotional and social component that develops very early. It is prosocial, meaning synchronized partners feel more positively inclined toward each other. Children are more likely to help out an adult with whom they are synchronized.<sup>7</sup> Basic synchronization generally develops around age four;<sup>8</sup> prior to that children are generally animated and moving in response to music, but not in synchrony.<sup>9</sup> Underscoring the importance of social interaction if modeling an adult, even two-and-a-half-year-olds can synchronize.<sup>10</sup>

#### **Animal evidence for basic synchronization**

This basic form of 1:1 SMS has attracted the majority of attention in comparative studies and has been described in a number of animals including several species of insects and frogs which create “synchronous choruses.”<sup>11</sup> These findings have inspired a number of evolutionary accounts explaining group synchronization because of the benefit synchronized chorusing has for increased spatial reach calls in order to attract mates or defend territory, the so-called “beacon effect.”<sup>12</sup> Nonhuman primates have been shown to have only very limited aspects of basic synchronization. Macaques, after training, can match the tempo of auditory and visual metronomes but are unable to match the phase, always tapping after the metronome. This is in contrast to humans who can tap on or even before the metronome. This result suggests that macaques do not have the same degree of prediction, although they are able to make some predictive use of the regularity because their reaction time is shorter to regularly timed sounds than randomly occurring ones.<sup>13</sup> (For comparison, budgerigars have similarly been trained with similar results.)<sup>14</sup> Chimpanzees can be trained to alternately tap keys on a keyboard, and their spontaneous tapping is weakly affected by a metronome, but only at tempos close to the original spontaneous tapping rate.<sup>15</sup> It is not known if they can be trained to synchronize. Comparative results have informed a number of theories, including the vocal learning hypothesis (discussed below) as well as the “gradual audiomotor evolution hypothesis,” which proposes that

our primate relatives might resemble earlier stages in the gradual emergence of BPS.<sup>16</sup>

### **Tempo and subdivision**

Compared to animals, humans have considerable flexibility even for basic SMS: (1) they are able to synchronize across a broad range of tempi, from roughly 30 to 300 bpm,<sup>17</sup> and can predictively follow tempo changes. (2) Humans can generally change the mode of synchronization from one movement per metronome tick to subdivisions and multiples, tapping, for example, twice per tick, or every two ticks, which we could call *m:n* synchronization. This is one way of establishing metrical hierarchy. Binary subdivisions and multiples are generally the easiest for nonmusicians,<sup>18</sup> but the system can accomplish more complex divisions, meters, and polyrhythms.<sup>19</sup> The latter implies the existence of some distance between input and output into which pulses can be selected and manipulated, such that the output need not slavishly follow the input.

### **Complex temporal patterns, hierarchy**

A second type of elaboration concerns the complexity of input and output patterns that can be represented and produced. Synchronizing with complex multipart music is an example of the former, while playing a complex drum pattern to a click track is an example of the latter. Of course, complex sounds can also lead to complex movements, and this is indeed the most common configuration. Key, however, is the existence of an internal pulse to tie it together. Basic auditory perception processes such as grouping of sounds, separation of different sources, and measuring event rate appear widespread in animals and are present in human newborns.<sup>20</sup> These processes are not necessary components of SMS, but rather enrichers of it, providing a wider variety of sound representations with which to synchronize.<sup>21</sup> A fully hierarchical, metrical, system of beats may further require brain regions that in humans are essential to language, which have been hypothesized to more generally implement nested hierarchies of action,<sup>22</sup> as well as require associated development of motor system complexity.<sup>23</sup> In animals, synchronization with actual music, with its multiple temporal scales, has been demonstrated to date in only cockatoos,<sup>24</sup> parrots,<sup>25</sup> and California sea lions,<sup>26</sup> with only cockatoos so far displaying hierarchical movement patterns – moving different parts of its body (head, trunk, feet) in sync with different metrical levels, as in human dance.<sup>27</sup>

### **Active perception**

A third elaboration which we believe to be critical for the fuller set of behaviors associated with rich BPS is for the motor pulse to influence

auditory perception, even in the absence of movement. In support of this blurring of the distinctions between hearing and moving, it has frequently been observed that during the perception of strongly pulse-inducing rhythms, motor planning regions are activated even in absence of movement,<sup>28</sup> suggesting they may play a role in generating an internal pulse. By studying multiple metrical interpretations of a single ambiguous rhythm, we have demonstrated that the pulse can influence auditory responses.<sup>29</sup> We have proposed the action simulation for auditory prediction (ASAP) hypothesis to formalize the idea that the motor system plays a causal role in perception through reciprocal transformations of auditory and motor pulses via the parietal cortex and that one explanation for human abilities is the presence of robust bidirectional connections in this network.<sup>30</sup> The active influence of pulse on auditory perception has not been demonstrated in any other animals to date though it has only been tested in a few species.<sup>31</sup>

### **Human expertise and training**

Though all of the foregoing mechanisms exist in humans, they may have varying levels of efficacy in different individuals and be dependent on implicit experience or training to be fully functional. For example, while synchronization with a metronome, simple subdivisions, or simple, strongly metrical patterns is easy for most nonmusicians, for many, synchronization with more highly syncopated patterns is more challenging.<sup>32</sup> Similarly, more complex  $m:n$  polyrhythmic synchronization ratios generally have to be learned. Active perception, by which our internal pulse shapes how we hear rhythm, is often challenged when we hear unfamiliar music from a different culture; only through experience can we begin to understand intended pulse structures.<sup>33</sup> Many first time salsa or West African dancers are acutely aware of this and face the need to learn, usually through the body, how to hear the pulse of these rhythms. Musicianship demonstrates the human ability to build, maintain, and assert an internal sense of pulse even based on audiovisual input streams with complex, shifting temporal relationships to a central but not directly expressed or reinforced pulse.

There are other levels of elaboration that we will not deal with in this short treatment, including the involvement of short- and long-term memory, the potential for complex syntactic structures of nested rhythmic patterns within patterns, and the connection of these more mechanistic aspects of rhythm perception and production with goals, motivations, and emotions. Notably, these higher levels are what strike us as most musical, and it is these that are often accounted for most directly in evolutionary accounts of the origin of human musical rhythm.

## **Accounts of the origin of beat perception and synchronization**

The first question is if musical behaviors evolved at all. Have we evolved to be rhythmic because of some fitness or survival benefit conferred to our distant ancestors that enabled those with the rhythmic skills outlined above to better survive to pass on their genes to the next generation? Alternatively, if rhythm is thought to confer no survival value, it cannot have been shaped by natural selection. In this case, is BPS merely a by-product of other adaptations which we have learned to use for musical purposes?

### **Nonadaptation views**

Most famous of the nonadaptation views is Pinker's<sup>34</sup> argument that music is "auditory cheesecake" in the sense that it was invented in order to stimulate existing auditory sensitivities (to vocal emotion, language, auditory scene analysis, etc.) in much the same way cheesecake was invented to titillate our (presumably evolved) desires for foods high in fats and sugars. In his view, music is a mere "pleasure technology" with no biological utility, a statement that proved surprisingly offensive to many, perhaps because it appeared to trivialize one of humanities dearest attributes. Pinker was criticized for a view too rooted in our modern, Western relationship to music where listening to recorded music predominates: indeed superficially, being deprived of one's iTunes, Spotify, or music videos should have no effect on an individual's survival. This is debatable, given pervasive uses of music for motivation and emotional regulation which surely impact our well-being and worldly and reproductive success. Music as pleasure technology seems even less tenable in a world prior to on-demand recorded music or in other cultures in which music and dance performance still play a more central and participatory role in daily life.

A related view is Patel's<sup>35</sup> suggestion that while music is nonadaptive, it is biologically useful in the life of an individual. Music is not a mere pleasure technology, but a "transformative technology of the mind" (TTM) that has impacts on more general cognitive functions like attention and language and provokes emotions by exploiting existing reward mechanisms, such as the reward for correct temporal predictions. Its universality is explained by analogy to another human technology, the control of fire. With regard to rhythm, Patel's "vocal learning hypothesis" accounts for the emergence of BPS as a by-product of adaptations for vocal learning, which is assumed to require strong connections between auditory

and motor systems to enable the tuning of motor acts to match the acoustics of sounds to be imitated.<sup>36</sup> If such circuitry extended to the whole body, not just vocal musculature, Patel suggested it could be a foundation for BPS. The hypothesis predicts that only vocal learning species, among them parrots and dolphins, should be capable of BPS. This excludes other primates who are not vocal learners. The hypothesis was initially confirmed by the discovery of the first nonhuman animal that could synchronize with a musical beat, a sulfur-crested cockatoo named Snowball, that was able to intermittently synchronize head-bobs to music of different tempos, demonstrating the ability to abstract a pulse from music and couple it to movement.<sup>37</sup> Subsequent support came from a survey of public videos that showed the only animals that quantitatively synchronized with music were cockatoos, parrots, and an elephant, all vocal learners.<sup>38</sup> The relative inability of nonhuman primates to synchronize is likewise consistent with the hypothesis. Similar abilities were demonstrated in a California sea lion, not a known vocal learner,<sup>39</sup> possibly contradicting the vocal learning hypothesis, although there remains some controversy on this point given its close relation to walruses and harbor seals, which are known vocal learners.<sup>40</sup>

Nonadaptation views, perhaps surprisingly, are in the minority. For one thing, they do not accord particularly well with the use of music in small-scale cultures, where ritual aspects predominate, and if music was invented for its cognitive benefits, it seems a rather roundabout way of transforming the mind. Beyond this, other thinkers, for better or worse, seem unable to resist the sense that music must be an adaptation, with distinct survival or reproductive advantages, given the universality of music in human culture, and the fact that music is, at least in some sense, unique to humans, that aspects of it appear innate and are deeply linked to emotion and groups. We will turn to these accounts next.

## **A brief introduction to evolution**

*Natural selection* was defined by Darwin as the principle “by which each slight variation, if useful, is preserved.”<sup>41</sup> “Useful” in this case means a variation in a trait that enhances an individual’s chance of surviving long enough to create progeny. This concept was proposed in the context that there is naturally occurring variation between individuals and there is considerable struggle for existence – because of geometric increases in population, many individuals will not survive. Over time, traits consistent with survival in the current environment will become enriched in the population. (The use of “natural” was

chosen in contrast to artificial selection by man, as in selective breeding.) Traits compatible with survival are often called *adaptations* and discussed as being *selected* by the environment, though both these terms are arguably too active to describe the phenomenon and should be understood without their usual sense of agency and goal direction. The beauty of this simple principle is that it can amplify traits at any level (so long as they can be inherited).

Darwin next defined *sexual selection* as a “less rigorous” form of selection not in terms of life or death, but an individual’s chance of securing mates, which then impacts their ability to create offspring. Sexually selected traits tend to differ in males and females and include those involved in direct competition within a sex (such as the size of a stag’s horns) and those involved in attracting the opposite sex, the canonical example of which is a peacock’s plumage. Two additional forms of selection are often discussed but are more controversial: *kin selection* as a way of explaining traits that give benefit to one’s relatives, though at the expense of oneself; and *group selection* as a way to explain traits that benefit the larger group, even though they may not directly benefit the individual. Group selection is controversial as it implies that groups are the units of selection, mutation, and reproduction (i.e., groups generate new groups). We’ll sidestep this interesting argument. I think the most helpful view is that traits can have effects at multiple scales: to recognize that humans are inexorably bound up in groups, and thus may have some traits that enhance their ability to be in a group; and that if these traits have overall positive impacts on their individual fitness, then this is all that matters in the end as humans are individuals that reproduce and mutate. Indeed Darwin noted in the context of natural selection that “In social animals [natural selection] will adapt the structure of each individual for the benefit of the community; if each in consequence profits by the selected change.”<sup>42</sup> That will do just fine for our purposes in understanding social aspects of rhythm.

## **Adaptational theories focused on the individual**

### **Sexual selection**

Darwin predates Pinker’s skepticism: “As neither the enjoyment nor the capacity of producing musical notes are faculties of the least direct use to man in reference to his ordinary habits of life, they must be ranked amongst the most mysterious with which he is endowed.”<sup>43</sup> He solved the mystery by suggesting, by analogy with bird song, that music must have played a role in our ancestors’ courtship, but colorfully suggests that

cultural developments have eliminated any original sexual dimorphism in the trait.

More recently, Miller<sup>44</sup> renewed the argument stating, “Music is what happens when a smart, group-living, anthropoid ape stumbles into the evolutionary wonderland of runaway sexual selection for complex acoustic displays.” Music is thus like Darwin’s famous example of selection, the peacock tail. Miller amusingly applies a common trope that rock and rollers have lots of sex, but don’t always live so long (so, music may actually be maladaptive for survival). Extrapolating to a time prior to birth control, he suggests this would have been a powerful means of enhancing reproductive success. Musical performance is an indicator of mate quality (though working through “preexisting perceptual and cognitive preferences” shaped by evolution). Musical expertise and prowess advertise stamina, physical coordination, and creative ability (a serious concern in novelty-craving species).

Others have rejected sexual selection accounts, perhaps too strictly, based on the fact that both sexes are musical (while most sexually selected traits are seen only in one sex). As we saw above, this is not a serious problem, as the differences could have been erased historically, or mate selection could be in both directions. Sexual selection may appear at odds with the group role of music in many small-scale societies, so sexual selection proponents tend to hark back to a time when music was more of a solo activity, which seems to be their major flaw. However, this seems not a critical objection, as who can doubt the ability of music and dance to introduce us to an individual intimately, whether they are alone or in a group, and play a role in attraction? For a social animal, part of attractiveness could well be the ability to stand out in a group while simultaneously displaying one’s ability to cooperate with others in a group. Group music-making could have developed as a more efficient way of finding mates in larger groups, compared to one-on-one interactions.

#### **Natural selection: adaptation for survival**

One of the first of the recent writers to speculate on the survival value of music, Roederer<sup>45</sup> identified music as a kind of acoustical-emotional pattern perception training tool that would enable the mother-child dyad to tune up the infant’s brain for the complex auditory pattern perception needed for speech perception as well as in emotional relationships. Infants and mothers deficient in necessary skills would be at a disadvantage in the social world. This view does not deal with rhythm or synchronization explicitly, but, as emotionally laden elements of music, accounts for a suggested role in maintaining group cohesion by

establishing ways to equalize or synchronize emotions. This view bears a striking similarity to Patel's transformative technology of the mind.

### **Theories rooted in bipedalism**

A number of accounts have identified the special development of bipedalism as a reason for the emergence of rhythmic synchronization. Bipedalism had numerous survival advantages, including freeing up the hands and arms for tasks other than supporting the body. Unlike quadrupedal locomotion, the energetically most efficient gaits for bipeds are all isochronous, with strict left/right alternation.<sup>46</sup> Thus, all humans would have endless experience with producing and hearing isochronous rhythms, as well as have the ability to smoothly modulate tempo. This could explain the motoric substrates for synchronization, as well as explain the human preference for walking-tempo isochrony,<sup>47</sup> but it does not immediately explain synchronization of movement to sound.

One suggestion, by Riggle,<sup>48</sup> explains the emergence of synchronization as a by-product of a system that rewards periodic vestibular and auditory inputs, a system that is proposed to motivate infants to begin walking and reward their production of steady gaits. Larsson<sup>49</sup> identifies bipedal locomotion as providing an opportunity for groups to match their walking and running gaits to reduce the continuous auditory masking that unsynchronized footfalls would create. By evolving the ability to synchronize gait, windows of quiet would be available to detect other important sounds of predators and prey. This could enable groups to move around more stealthily by obscuring the size of a group and confer a survival advantage.

### **Theories rooted in caregiving**

Bipedalism brought with it disadvantages, including the need for a smaller birth canal due to constraints on pelvic shape, which in turn necessitated giving birth to helpless infants born at an early stage of development. Dissanayake<sup>50</sup> proposes that a motivational system had to evolve to ensure that bipedal mothers would become committed to the extended caregiving required by their immature infants and that this selective pressure led to a structured form of rhythmic emotional bonding that depended on abilities to predict the timing of others actions and to feel bonded because of it. This initial foundation supports the continuous use of musical interactions throughout life and exemplifies the grander sweep of more holistic origin hypotheses – embedded in a supramodal framework of ritual and imitation, rhythmic synchrony becomes just one piece in the whole that combines emotion, sociality, and rhythm.

## **Adaptational theories focused on groups**

### **Rhythm as facilitator or marker of social groups**

Music-making is often done in groups. Brown<sup>51</sup> has argued core features of music, including a temporal structure that readily encourages group synchronization, are optimal for making this so. The communal participatory use of music in small-scale cultures reinforces this notion of music's central use. Not surprisingly then, many evolutionary accounts of music emphasize its ability to create cohesive groups, some going so far as to state that the capacity to synchronize is the critical developmental milestone that enabled the growth of human culture by enabling earlier humans to form larger groups, using the power of joint synchronization to ease the inevitable social tensions that forced earlier groups to fracture.<sup>52</sup> Many others have pointed out that music can serve as a sort of social glue and medium for group emotional regulation and communication, that builds group identity.<sup>53</sup>

Related to the idea that music serves to build groups is the parallel that music serves to advertise the quality of a group. Merker<sup>54</sup> explains the emergence of isochronous group synchronization as a modification of a behavior like the chimpanzee "carnival display," a riotous group movement and noisemaking session in response to finding a fruit tree. He supposes that if a common ancestor of chimpanzees and humans was able to develop means of synchronizing such vocalizations as a group, the summed super-voice could advertise food abundance more broadly to migrating females and draw them in. This "beacon effect" was previously used to explain group chorusing in other synchronously chorusing species. He further hypothesizes that, because of the linkage of breathing, vocalization, and locomotion, such displays might be at around the walking pace, the rate that modern humans prefer to synchronize. In contrast to Fitch,<sup>55</sup> Merker dismisses primate "drumming" displays as merely individual noisemaking often presented at biophysically limited maximum rates (one might think of a captive animal rattling a cage door), and thus not a promising foundation for synchronization.

Hagen and Bryant<sup>56</sup> suggest music is at the heart of an even higher level of human social organization: the existence of intergroup relationships in the absence of any kinship ties. They propose that music and dance enabled this more complex social organization by acting as both a group identifier and a credible indicator of group quality for the purpose of forming mutually beneficial alliances with other groups. Music and dance performances take much longer to prepare than to perform, and thus a short performance can instantly communicate a large degree of credible information about group stability and ability to act in a coordinated way. Only established groups with adequate time and traditions

could prepare impressive displays. This account is proposed to explain why humans with greater musicality in both production and discrimination of quality would be better adapted to signal group quality. This argument is quite similar to a sexual selection hypothesis, only operating at the levels of groups. While compelling ethnographic evidence for the model of using music and dance to court other groups for alliances is presented, this account seems to fit equally well with a nonadaptational account such as TTM in which cultural innovation built on preexisting abilities replaces biological adaptation.

### **Future directions**

We have tried to lay out the wide spectrum of accounts for the origin of human beat-based rhythm. It is a fascinating, though admittedly incomplete, set of views. Each one seems to have made one or more leaps, and most focus intently on only part of the evidence available. As unsatisfying a conclusion as it might be, it seems likely that all of the foregoing accounts have some aspects that are correct: music and rich BPS are complexes of many individual components, and most accounts so far have simplified this. Every account, even nonadaptation accounts, presumes that functional aspects evolved, but disagree on what selective pressure led to this. On top of these adaptations, we have apparently invented vast and varied traditional repertoires of music and dance for a range of purposes. It remains to sharpen the conceptual account of the components of human rich BPS and to find neural mechanisms accounting for these different components. The input of percussionists would be most welcome here. Ultimately, we need an account for the evolution of each aspect of rich BPS, and to determine if they are separable, evolved for specific reasons, or are best considered as a whole. There are of course many other questions left unanswered: If the benefits of group music-making are so powerful, why have they not evolved more often? Is it that the neural change needed to link auditory and motor systems is difficult to evolve, or is it that other species lacked the social milieu and essential prerequisites for the addition of this link to be of any value? We hope the reader is sufficiently stimulated to read further and join the debate.

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## Index

- Abe, Keiko, ix, 44, 46, 48, 53, 119, 163, 298  
Abel, Alan, 3, 10  
Ableton Live, 92  
Adams, John Luther, 147  
Adzenyah, Abraham, 229, 234  
Afro-Cuban, 244  
*Agbadza*, 175  
Aho, Kalevi, 125  
Akai, 88  
Albert, Ludwig, 52  
Aluphone, 44  
*amadinda*, 64, 65, 66, 246  
ancillary gestures, 130, 271, 272, 275, 277, 278  
Andriessen, Louis, xiii, 51, 126, 127, 169  
Aperghis, Georges, 128, 137  
Applebaum, Mark, 135  
Aquarian, 73, 74  
Arbeau, Thoinot, 243  
Asabuki, Eiichi, 45  
*Atsiagbekor*, 175, 235
- Bach, Johann Sebastian, 97  
backbeat, 85, 94, 191, 216  
Baker, Arthur, 87  
Baker, Ginger, 69  
Balter, Mike, 45  
Bambaataa, Afrika, 87, 92, 94  
bamboo, 103  
Bang on a Can, xvi, 105, 144  
banjo, 248  
Baroque, 115, 123, 296, 299  
Bartók, Béla, 99, 100, 112  
Basia, Count, 191, 193, 198, 214  
bass drum, 23, 36, 39, 67, 68, 74, 86, 91, 150, 174, 194, 195, 201, 206, 213, 216, 219, 220, 221, 224, 239, 241, 242, 243  
Basta, James, 45  
Baur, Steven, 206  
beat, xii, 83, 84, 85, 87, 92, 94, 104, 148, 149, 150, 152, 175, 187, 189, 190, 191, 192, 194, 195, 197, 200, 203, 205, 208, 217, 233, 234, 237, 238, 240, 250, 256, 257, 259, 262, 269, 270, 277, 278, 281, 282, 283, 287, 288, 293  
beat-boxing, 238  
Beatles, iii, 206, 209, 250  
Bebey, Francis, 244  
be-bop, 188, 192, 198  
Beck, John, xvii, 12, 19, 224  
Becker, Howard, 212
- Beethoven, Ludwig van, iii, xiv, 8, 29, 53, 98, 99, 100, 101, 103, 107, 113, 114, 143, 150, 152, 156, 173, 200, 243, 297  
beguine, 84  
*bel canto*, 145  
bell, 175, 177, 180, 235  
Bell, Dylan, 229  
Bellson, Louis, 68, 215, 219  
Belon, Pierre, 243  
*bendé*, 255, 256  
*bendir*, 242  
Bergerault, 44  
Berio, Luciano, 48  
Berliner, Paul, 250, 252, 296  
bipedalism, 291  
Blackearth, xiv, 55, 111  
Blaine, Hal, 216  
Blakey, Art, 69, 194  
Blondie, 85  
blues, 68, 245, 246, 248  
Bollywood, 234  
*bonang*, 255  
bones, 133, 151, 248  
bongo, 69, 70, 178  
Bonham, John, 218  
bossa nova, 85, 246  
Boston Symphony, 11, 19, 50, 72, 78  
Boulez, Pierre, 46, 50, 156  
Bowles, Edmund A., 8  
Bozzio, Terry, 220  
Brahms, Johannes, iii, 155, 156  
brake drums, 103, 113, 245  
Bralower, Jimmy, 86, 90, 93, 94  
Britten, Benjamin, 156  
Broadway, xiii, 2, 31, 37, 173  
Broughton, Mary, xvii, 274  
Brown, Arthur, 85  
Brown, James, 191, 193, 201, 202, 205, 208, 209  
Brown, Rich, 234  
Brubeck, Dave, 12  
Bruford, Bill, 89, 94  
brushes, 151  
Burns, Roy, 73, 74  
Burritt, Michael, 130, 272, 274  
Burton, Gary, 44, 45, 46, 53, 297
- cabasa, 70  
Cage, John, iii, ix, 2, 55, 97, 102, 106, 111, 112, 115, 117, 129, 161, 168, 169, 175, 241, 244, 251, 268, 300

- Calato, Joe, 72  
 calfskin, 22, 23, 71, 215  
 call-and-response, 203, 247  
 calypso, 246  
 Carnegie Hall, xvi, 10, 49, 106, 123  
 Carneiro, Pedro, 45  
 Carter, Elliott, 50, 125, 166  
 castanets, 23, 24  
 Catlett, Sid, 11  
 cello, iv, 62, 280  
 Centre Pompidou, 147  
 Chaffin, Roger, 278  
 chamber music, 2, 31, 32, 46, 50, 100, 101, 107,  
     109, 112, 117, 119, 124, 130, 147  
 Chamberlin Rhythmate, 84  
 Chamberlin, Harry, 84, 85  
 Chapin, Jim, 218, 219  
 Chenoweth, Vida, 45, 46, 53, 54, 119  
 Chester, Gary, 220  
 Cheung, Pius, 51  
 chimes, 44, 53, 62, 255  
 chimpanzees, 284, 294  
 Chopin, Frederic, iii, 163, 234, 276  
 Cirone, Anthony J., 10  
 clarinet, 19, 50, 143  
 Clark, Mike, 201  
 Clarke, Kenny, 216, 219  
 claves, 84, 107, 180  
 Clayton, Jay, 178  
 Cobb, Jimmy, 191, 194  
 cockatoos, 285, 288  
 Cocker, Joe, 191  
 Coe Percussion, 44  
 Cohen, Leonard, 234  
 Cohen, Martin, 69, 72, 73, 80  
 Colaiuta, Vinnie, 190, 212, 224  
 Collins, Phil, 85, 93  
 colotomic, 255  
 Coltrane, John, 229  
 conch shell, 104  
 Concorde, 44  
 conga, 70, 79  
 Cook, Gary, 52  
 Coquillat, Willy, 128  
 counterpoint, xi, 100, 175, 176, 192, 194, 196,  
     230, 235  
 cowbell, 69, 220  
 Cowell, Henry, 82, 93, 110, 241, 244, 245  
 Creston, Paul, 45, 117  
 Crosby, Bing, 173  
 Crumb, George, 46  
 Cunningham, Merce, 109, 110  
 Curtis Institute of Music, 10  
 cycle, 58, 114, 262  
 cymbal, 8, 23, 24, 36, 60, 63, 67, 68, 69, 72, 77, 78,  
     79, 199, 201, 203, 206, 214, 220, 241, 243, 255,  
     260, 262  
 Czerny, Carl, 163  
 D, Chuck, 207  
 Dagbamba, 242  
 Davis, Joshua aka DJ Shadow, 88  
 Davis, Miles, 173, 174, 191, 198, 216  
*davul*, 243  
 de Leeuw, Ton, 47  
 de Mey, Thierry, 137, 268  
 Deagan, J. C., 43, 53, 73  
 Dean, Matt, 211  
 Deane, Christopher, 51  
 Debussy, Claude, 253  
 DeChristopher, John, 73, 77, 78  
 DeMorrow, 44  
 Dennison, Doris, 110  
 DeVeaux, Scott, 216  
*dihhi*, 263, 264  
 Dilla, J, 92  
 Dillon, James, 156  
 DiMuzio, Lennie, 78  
*djembe*, 249, 250  
 Doerschuk, Bob, 86  
 Doyle, Peter, 204  
 Dreiman, Bill 'Marimba', 45  
 drone, 165, 170  
 Drouet, Jean-Pierre, 128, 133, 137, 140  
 drum corps, 71, 72, 101, 164  
 drum kit, 85, 89, 201, 202, 206, 208  
 drum set, 2, 67, 68, 77, 78, 89, 121, 179, 195, 211,  
     212, 213, 214, 215, 216, 218, 219, 220, 221,  
     222, 223, 224, 238, 239, 248, 249, 268  
 Duff, Cloyd, 10  
 Dun, Tan, 144  
 Duran Duran, 88  
 Dynasty, 44  
 Eastman School of Music, xiv, 12, 13, 16, 17  
 electronic dance music, 87, 88, 90, 208  
 electronics, 52, 53, 84, 85, 152, 175, 179, 183, 211  
 Ellington, Duke, iii, 191  
 Emerick, Geoff, 206, 209  
 Encore Mallets, 45  
 Erskine, Peter, x, xiv, 2, 75, 76, 77, 78, 126,  
     187, 193  
 Eshun, Kodwo, 91  
 Evans, 71, 296  
 Ewazen, Eric, 49  
 Ewe, 175, 246, 296  
 Famularo, Dom, 216  
 Feldman, Morton, 117, 168  
 fiddles, 248  
 fife, 248  
 Firth, Vic, 11, 19, 45, 55, 72, 73  
 Fissinger, Alfred, 46  
 flam, 248  
 flamacue, 248  
 flower pots, ix, 106, 113, 114  
 flute, 50, 143, 248

- Flying Lotus, 92, 94  
 Foss, Lukas, 110  
 Francis, Paul, 78  
 Hinger, Fred, 268  
 Friedman, David, 45  
 Friese, Alfred, 9, 10, 19  
 Friis, Morten, 120  
 Frisell, Bill, 196  
 frying pan, 145  
*Fujii Database*, 53  
 funeral (bands, music), 248  
 funk, 2, 68, 85, 87, 91, 187, 188, 192, 201, 202, 205, 208, 209, 216, 262  
  
 Gadd, Steve, 191, 201, 208, 217, 218, 221, 224  
 gamelan, x, xiii, 229, 231, 253, 254, 255, 263, 264, 296, 300  
*gankogui*, 175  
 Garibaldi, David, 201, 202, 208  
 Gaye, Marvin, 87  
 Gershwin, George, 107  
 Gewandhaus Orchestra, 8, 9, 18, 19  
 Ghana, 175, 242, 246, 247  
*gharana*, 19  
 ghost notes, 201, 202, 203, 205, 208, 209  
 Gibb, Robin, 84  
 Gibbs, Terry, 44  
 Gilbert, Jeremy, 92  
 Ginsborg, Jane, 278  
 Glass, Philip, 229, 245  
 Glennie, Evelyn, 49, 119  
 Globokar, Vinko, 128, 133  
 glockenspiel, 8, 25, 36, 43, 123, 178, 180  
 Goldenberg, Morris, 52, 273, 279  
 gong, 23, 24, 146, 150, 176, 255, 256, 257, 260, 262  
 Goodman, Benny, 214  
 Goodman, Saul, 9, 10, 11, 12, 19, 173  
 Gordon, Michael, 104, 245  
 gospel, ii, 221, 225  
 Green, George Hamilton, 45, 47  
 Green, Ray, 110, 244  
 Grenser, Friedrich August, 8  
 Gretsche, Fred, 68, 73  
 Gronemeier, Dean, 52  
 groove, 2, 82, 90, 92, 93, 94, 187, 191, 192, 193, 196, 197, 199, 200, 201, 202, 203, 204, 206, 207, 208, 209, 217, 223, 233, 242, 246, 249, 264  
 Gruber, HK, 126  
*gungon*, 242  
 guru, 235  
 G-Wiz, Gary, 207  
  
 Hamilton, Chico, 68  
 Hampton, Lionel, 11, 44, 45  
 Hanley, Ed, 229, 238  
 Hardenberger, Håkan, 124  
  
 Harr, Haskell, 173  
 Harrison, George, 229  
 Harrison, Lou, 110, 169, 241, 244, 251  
 Harry, Deborah, 85  
 Hartsough, Jeff, 80  
 Hatzis, Christos, 50  
 Haydn, Josef, iii, 99, 101, 123, 243  
 Haynes, Roy, 194  
 Headhunters, 2, 201  
 heartbeat, 281  
 Heath, Percy, 174  
 Heinemann, Herr, 10  
 Helble, Raymond, 47  
 hemiola, 195  
 Henze, Hans Werner, 47, 118  
 Herc, DJ Kool, 206, 207  
 Higdon, Jennifer, 123  
 hi-hat, 170, 214, 220, 221  
 Hindemith, Paul, 123, 161  
 Hindi, 238  
 Hindustani music, 164, 165  
 hip hop, 87, 88, 90, 92, 203, 205, 206, 207, 208, 209, 210  
 Hiraoka, Yoichi, 20, 45, 46  
 hocketing, 108, 257  
 Holt, Simon, 123  
 Hovhaness, Alan, 46, 119  
 Humphrey, Ralph, 215  
 Hutcherson, Bobby, 45  
 Hyer, 45  
  
 improvisation, 162, 194, 202, 230, 236  
 Isherwood, Nicolas, 135  
  
 Jackson, Milt, 45  
 Janissary, 167, 241, 242, 243, 251  
 Jarre, Jean Michael, 84, 93  
 jawbone, 70  
 jazz, xiii, xv, 3, 8, 11, 31, 46, 68, 69, 70, 75, 163, 164, 173, 187, 188, 190, 192, 193, 202, 214, 216, 218, 221, 224, 229, 230, 233, 234, 235, 236, 237, 238, 239, 242, 245, 246, 247, 248, 263  
 Abercrombie, John, 196  
 Johnson, Marc, 196  
 Jones, Elvin, 78, 191, 192, 221  
 Jones, Harold, 191, 193  
 Jones, Jo, 191, 214, 216  
 Juilliard School, 10, 14  
 junk, 104, 106, 145  
  
 Kagel, Mauricio, 128  
 Kakehashi, Ikutaro, 84  
*kanjira*, 231  
 Kaptain, Laurence, 50  
 Karnatak music, 229, 239  
 Katoh, Tsutomu, 84  
 Katz, Mark, 201, 205

- kempur*, 255, 256  
*kendang*, 255, 256, 257, 260, 261, 262  
 Kent, David, 19  
 Kenton, Stan, 76  
 Kernfeld, Barry, 201  
 kettledrums, 7, 243  
 keyboard, 22, 25, 26, 34, 35, 36, 43, 44, 45, 66, 72,  
     79, 82, 97, 99, 120, 131, 168, 284  
 kick drum, 84, 87, 174, 202, 203, 204, 205,  
     206, 207  
 Kincaid, William, 14  
 King Crimson, 89  
 Klatzow, Peter, 49, 119  
 Kodaly, Zoltan, 237  
 Kohloff, Roland, 12, 19, 173, 246  
*Konmakol*, 229, 240, 299  
 Korg, 84, 85, 89, 90, 93  
 Kori, 44  
 Korogi, 44  
*korvai*, 231, 232  
*kotekkan*, 176  
 Kraftwerk, 85, 87, 92  
 Kroumata, 111, 113, 119  
 Krupa, Gene, 11, 173, 214  
 Kulesha, Gary, 50  
 Kurka, Robert, 45
- La Jolla Symphony, xvi, 143, 144, 146, 153  
 Lachenmann, Helmut, 154  
 Lang, David, 51, 104, 112, 113, 114, 144, 245  
 Lange, Thomas, 220  
 Latin Percussion, 69, 72, 80  
 Latour, Bruno, 212  
*laya*, 233  
 Leedy Drum Company, 43  
 Lewis, Mel, 77, 191  
 Ligeti, Gyorgy, 51, 117  
 Linn, Roger, 86, 88, 91, 92, 93, 94  
 Lipscomb, Scott, 130  
 Lisboa, Tânia, 278  
 Lomax, Alan, 247  
 Lombardi, Don, 73  
 Ludwig, William F. and Theobald, 20, 44, 45, 52,  
     67, 72, 74, 76, 213, 299  
 Lutoslawski, 253
- macaques, 284  
 Mackey, Steven, 49  
 MacMillan, James, 118  
 Mahler, Gustav, iii, 143, 154, 156  
 Majestic, 44  
 Malletch, xiii, 44, 45, 73  
 mallets, xiii, 25, 36, 44, 47, 52, 53, 61, 62, 65, 72,  
     78, 151, 155, 255, 256, 269  
 Mande, 249, 251, 297  
 Manhattan School of Music, 111  
 Maraïre, Dumisani, 250  
 Maric, Dave, 122, 127
- marimba, xv, 1, 12, 25, 35, 43, 44, 45, 46, 47, 48,  
     49, 50, 51, 52, 53, 56, 60, 61, 65, 72, 79, 117,  
     119, 123, 125, 126, 128, 130, 140, 145, 162,  
     163, 167, 178, 180, 243, 249, 268, 273, 275  
 Marimba Nandayapa, 51  
 Marimba One, 44, 73  
 Marimolin, 49  
 Martland, Steve, 122, 127  
 Maslanka, David, 47  
 Massey, Graham, 88  
 Masson, Askeil, 118  
 Mather, Bruce, 161  
 Mayer, Jojo, 217  
 Mayuzumi, Toshiro, 46  
*mbira*, xvi, 3, 246, 249, 250  
 McLaughlin, John, 229  
 McLeod, John, 118  
 Mendelssohn, Felix, 8  
 Menuhin, Yehudi, 229  
 Messiaen, Olivier, 229  
 metallophone, 59  
 meter, 176, 177, 180, 181, 187  
 metronome, 84, 130, 231, 270, 284, 285, 286  
 Metropolitan Opera, 13, 29  
 Miki, Minoru, 46  
 Milhaud, Darius, 117  
 Mills College, 245  
 Mimura, Nanae, 50  
 minimalism, 245  
 Miyoshi, Akira, 46  
 Mizuno, Saburo, 44  
*Modern Drummer*, xiv, xv, 68, 70, 75, 80, 90, 93,  
     94, 208, 217, 218, 224, 225, 297, 298, 299  
 Moeller, Sanford A.'Gus', 17  
 Moody, Rick, 91  
 Moon, Keith, 69  
 Morello, Joe, 11, 12  
 Mortensen, Gert, 118  
 Motown, 187, 191, 198  
*mrdangam*, 3, 229, 231, 232, 236, 238, 239  
 Mulligan, Gerry, 191  
 multiple percussion, 150, 249, 268  
 Muslim, 243  
 Musser, Clair Omar, 43, 119  
 Mussoorgsky, Modest, 253  
 Mycka, Katarzyna, 50  
 Mylar, 215
- nadai*, 231  
*nakers*, 243  
*naqqarah*, 243  
 Native American, 102, 103, 104  
 natural selection, 287, 289  
 Negus, Keith, 216  
 New Orleans, 192, 246, 248  
 New Percussion Quartet, 110  
 New School, 83  
 New York Philharmonic, 10, 14, 173

- Nexus, 47, 111, 113, 119, 229, 235  
 noise, 24, 59, 87, 97, 98, 103, 104, 112, 113,  
     131, 138, 157, 169, 170, 172, 175, 201, 244,  
     245, 270  
 Norgaard, Per, 118  
 Northern Illinois University, xiv  
 Norvo, Red, 44, 45  
 Nussbaum, Adam, 78  
 Nuyts, Frank, 50, 119
- Oberheim, 91  
 Oberlin Conservatory, xiv, 11, 55, 111  
 oboe, 14  
 Oliver, Jay, 218  
 Olympos, 56, 58, 59, 60, 64  
 Orff, Carl, 237  
 organ, 84, 85, 122, 194, 204, 220  
 Osanai, Tadashi, 84  
 ostinato, 175, 202, 207, 208, 214,  
     256, 262  
 Otte, Allen, 111  
 overtones, 21, 23, 24, 56, 57, 59, 60, 62,  
     63, 65, 215, 221, 250  
 Owen, Charles, 34
- Paich, Marty, 191  
 Paiste, Robert and Toomas, 72  
 Panufnik, Andrzej, 120  
 paradiddles, 181  
 Paris Conservatoire, 11, 14  
 Parker, Charlie, 173, 188  
 Parsifal glockenspiels, 43  
 Partch, Harry, 55  
 partials, 56, 62  
 Paterson, Robert, 52  
 Payne, Jim, 201  
 Payne, Sonny, 191, 193  
 Peabody Conservatory, 49  
 Pearl Drums, 73  
 Pearson, Ewan, 92  
 Peart, Neil, 218  
 pedagogy, 32, 51, 126, 163, 237,  
     242, 248, 250  
*pelog*, 257  
 Percussions de Strasbourg, Les, 119  
 Percussive Arts Society (PAS), 47, 77  
 Peter Maxwell Davies, 48, 118  
 Peterson, Oscar, 191  
 Pfundt, Ernst, 8  
 phasing, 175, 179, 246  
 Philadelphia Orchestra, 10, 14  
 piano, xvi, 8, 17, 19, 45, 48, 53, 56, 84, 97, 99,  
     118, 119, 123, 125, 126, 163, 173, 180, 195,  
     230, 231, 232  
 Piano, Renzo, 147  
 piccolo, 107, 152  
 Pike, Dave, 45  
 Piper, John Mark, 44
- Pittsburgh Symphony, 10, 68  
 plastic heads, 71  
 police whistle, 107  
 polyrhythm, 65, 241, 249  
 popular music, xv, 3, 8, 68, 82, 84, 92, 187, 205,  
     207, 209, 215, 216, 236, 248  
 Porcaro, Jeff, 86, 197  
 Premier Drum Company, 43  
 Price, Paul, 111  
 Prince, 87  
 Ptaszynska, Marta, 50  
 Public Enemy, 207  
 pulse, 65, 68, 85, 188, 191, 192, 194, 196, 235,  
     250, 270, 281, 283, 284, 285, 286, 288  
 Purdie, Bernard, 201
- quills, 248
- raga*, 165, 234  
 ragtime, 46, 248  
 ratamacue, 248  
 ratchet, 22  
 rattles, 23, 98, 247  
 Rautavaara, Einojuhani, xiii, 123  
 Reed, Ted, 11, 219  
 reggae, 207, 246  
 Remo Belli, 72, 73  
 repetition, 191, 224, 298  
 resonator, 61, 211  
*reyong*, 255, 256, 257, 258, 260, 262  
 rhythm, xiv, 1, 3, 17, 82, 83, 84, 85, 86, 87, 91, 93,  
     99, 112, 138, 142, 164, 170, 173, 174, 175, 177,  
     180, 182, 187, 190, 194, 195, 196, 198, 201,  
     202, 210, 230, 231, 233, 234, 237, 245, 246,  
     250, 257, 259, 264, 269, 270, 271, 279, 281,  
     282, 283, 286, 287, 289, 290, 291, 293  
 Rhythmicon, 82, 83, 93  
 Rich, Buddy, 74, 77, 118, 198, 215  
 Richards, Emil, 46  
 ride cymbal, 69, 174, 176, 187, 190, 194, 216  
 Riley, Terry, 169  
 Rimsky-Korsakov, 39  
*riqq*, 243  
*Rite of Spring*, 173  
 ritual, 255, 258, 259, 260, 261, 288, 291  
 Roach, Max, 174, 193, 214  
 Roberts, John Storm, 247  
 rock and roll, 68, 70  
 Rogers, Joseph, 73  
 Rogers, Richard, 147  
 Roland (electronics), 12, 19, 85, 87, 88, 89, 90,  
     173, 246  
 Roldán, Amadeo, 110  
 Rosauero, Ney, 50, 120  
 Rosen, Michael, xvii, 111  
 Rosengarden, Bobby, 70  
 Rossing, Thomas, 56  
 Roundtop glockenspiels, 43

- Rouse, Christopher, 118  
 Royal Academy of Music, 120  
 Royal Conservatory of Music, 230  
 Royal Scottish National Orchestra, 121  
 ruff, 248  
 rumba, 84, 242, 246  
 Russell, William, 110, 244
- Sabian, xiii, 72, 73  
 Sadler, Eric 'Vietnam', 207  
 Safri Duo, 120  
 Sahai, Sharda, 19, 229  
 salsa, 246, 286  
 samba, xv, 192, 218, 242, 246  
 Samuels, David, 45  
 Samuels, Ron, 73  
 Sanskrit, 238, 240, 261  
 Sato, Hidehiko, 45  
 Savery, Uffe, 120  
 saw blade, 104  
 scat singing, 233, 234, 237  
 Schmidt, Hermann Gustav, 9  
 Schoenberg, Arnold, iv, 55, 97, 129, 147, 161, 280  
 Schubert, Franz, iv, 173  
 Schuller, Gunther, 49, 154  
 Schwantner, Joseph, 49, 118  
 Schwar, Oscar, 10, 13  
 Schwertsik, Kurt, 53, 123  
 Seattle, 110, 176  
 Séjourné, Emmanuel, 51, 52, 274  
*Semar Pegulingan*, 176  
 Serry, John, 47  
 Sexton, Peggy, 248  
 sexual selection, 289, 290, 293  
 Shona, 246, 296  
 Side Man, 84, 86, 93  
 Silver, Horace, 126, 174  
 Simmons, 88  
*sistrum*, 243  
 Siwe, Thomas, 53  
 Slingerland, Bud, 73  
 Small, Christopher, 212  
 Smith, Steve, 78  
 snare drum, 22, 23, 36, 79, 214  
 Snowball, 288  
 Sō Percussion, xvi, 2, 98, 110, 112, 113, 114, 115, 168, 169, 170  
*solkattu*, 229, 231, 237, 239, 240, 299  
 Soph, Ed, 214  
 soul, 191, 259  
 Southbank Centre, 126  
 Spandau Ballet, 88  
 Starks, John 'Jabo', 193  
 Starr, Ringo, 206, 209, 250  
 steel drums, 103  
 Stensgaard, Kai, 52  
 Reich, Steve, 63, 169, 183, 235
- Stevens, Leigh Howard, 73  
 Stewart, Bill, 78  
 Stockhausen, Karlheinz, 112  
 Stoltzman, Richard, 176  
 Stone, George Lawrence, 219  
 Stout, Gordon, 47, 167  
 Strang, Gerald, 110, 244  
 Stravinsky, Igor, 39, 116, 144, 161, 162, 181  
 Street, William G., 12, 13, 20  
 string quartet, 99, 100, 107, 168  
 Stubblefield, Clyde, 2, 193, 201, 208  
 Sumarsam, 253, 254, 264, 300  
 Sundanese, 262  
 Sutter, Wendy, 144  
 Suzuki, D. T., 17  
 swing, 86, 88, 89, 92, 93, 187, 190, 191, 192, 216  
 Sylvestre, Gaston, 128, 133  
 Syndrum, 88, 89, 94  
 Synergy Percussion, 111  
 synth pop, 88, 90, 91  
 synthesizer, 87, 208  
 Szymanowski, Karol, 52
- tabla*, xvi, 19, 229, 238  
*tabor*, 242  
 Tabuteau, Marcel, 14, 20, 300  
*taiko*, xiv, 101, 263  
 Takahashi, Michiko, 44, 47  
 Takemitsu, Toru, 47  
*tala*, 231, 234  
 tam tam, 60, 63  
 Tama Drums, x, 73, 76  
 tambourine, 8, 24, 241, 243, 270  
 Tanaka, Toshimitsu, 46  
 tango, 84  
 techno, 87, 90, 92  
 Telemann, Georg Philipp, 99  
 temple blocks, 24, 65, 84  
 Tenzer, Michael, 253, 254, 264, 300  
 Théberge, Paul, 216  
 Theremin, Léon, 82, 83  
 Thigpen, Ed, 191  
 Thomas, Bobby, 177  
 thunder sheet, 104, 245  
 timpani, 1, 7, 8, 9, 10, 11, 12, 14, 16, 17, 18, 19, 22, 35, 55, 63, 66, 72, 79, 103, 120, 121, 128, 145, 199, 241, 249, 268  
 tin can, ix, 104, 105, 106, 107, 128, 169  
*tombak*, 137  
 tom-tom, 68, 104, 140, 206, 214  
 Torke, Michael, 121  
 TorQ, 271  
 Tower of Power, 201, 208  
 triangle, 21, 241, 243, 248  
*Trio le Cercle*, 128, 132, 137  
 trumpet, 11, 19, 124  
 tuba, 145

- Tudor, David, 175  
 Turkish crescents, 243  
 Turnage, Mark-Anthony, 126  
 twelve-tone, 176  
  
 University of Illinois, xv, 49, 111  
  
 van Sice, Robert, xvii, 49, 112, 119  
 VanderPlas, 44  
 Varèse, Edgard, 98, 116, 127, 131, 147,  
   156, 241, 245  
 Velez, Glen, 229, 237  
 vibraphone, 25, 35, 36, 43, 44, 45, 46, 48,  
   49, 51, 52, 53, 117, 142, 145, 176, 180  
 Vibraslap, 70  
 Viñao, Alejandro, 50  
 viola, 168  
 violin, 8, 10, 12, 13, 49, 50, 107, 126, 152  
 vocables, 248  
  
 Wallen, Errollyn, 120  
 Wallin, Rolf, 125, 127  
 wash tub, 104  
 Wavedrum, 89  
 Weckl, Dave, 217, 221, 224  
 Wen-chung, Chou, 148  
 Wesley-Smith, Martin, 50  
 Westlake, Nigel, 50  
 Wettling, George, 11  
 Wieck, Friederich, 8  
 Williams, Jan, 110  
  
 Williams, John, 162  
 Williams, Tony, 192, 198  
 wind chimes, 59, 60, 66  
 Wolfe, Julia, 104, 125, 127, 245  
 wood block, 23  
 Woodstock, xiv, 60  
 Woodyard, Sam, xii, 191, 194  
 Wuorinen, Charles, 48  
 Wurlitzer, 84, 85, 86  
 Wyre, John, 229  
  
 Xenakis, Iannis, 112, 118, 145, 155, 156, 168  
 xylophone, 8, 11, 13, 20, 21, 25, 36, 43, 45,  
   46, 47, 51, 53, 60, 61, 64, 123, 151, 180, 241,  
   243, 246  
  
 Yale University, xvi, 49, 112, 113, 224,  
   251, 299  
 Yamaha, 44, 45, 47, 49, 73, 76  
 Yamashta, Stomu, 118  
 yoga, 156, 233  
 York University, xiii, 210, 229, 230  
 Young, La Monte, 229  
 Yuyama, Akira, 46  
  
 Zagorski-Thomas, Simon, 217  
 Zeltsman, Nancy, 49, 119  
 Zildjian, ix, 72, 73, 78, 79  
 Zimbabwe, 246, 296  
 Ziporyn, Evan, 245  
 Zivkovic, Nebojsa, 51, 53