Events

NAMM 2000, International Music Market

International Music Products Association, Los Angeles Convention Center, Los Angeles, California, USA, 3–6 February 2000

Reviewed by Frode Holm
Santa Barbara, California, USA

What follows is a quick snapshot of some items that caught my attention at this year’s International Music Products Association (NAMM) show in Los Angeles. There is far more to see and hear at NAMM than one can take in with a short visit, so I’m sure I have missed quite a few important announcements.

If it wasn’t obvious already, then certainly this year’s show brought it home once and for all: the magic numbers 24/96 (24-bit/96 kHz sampling rate) were attached to just about everything you could cast your eyes upon. Among the more curious manifestations of this stampede was a new mastering and CD-burner unit from Alesis, the ML-9600 Masterlink. It proclaims a “revolutionary new CD24” format, apparently squeezing 24/96 onto an “ordinary audio CD.” When pressed, the company representative was unable to explain how this was different from just writing an ordinary audio file onto a CD-ROM ISO 9660 formatted disk. Ah, the wonderful world of market-speak! This aside, the unit has an impressive set of features, including a full complement of mastering functions such as compression, limiting, equalization, and normalization. Sixteen different playlists can be stored with individual track settings for gain, fade-in and fade-out, and pause. And of course, the usual set of analog and digital in/outs is included. All for a suggested retail price of US$ 1,699.

Speaking of mastering, Yamaha was upping the ante in the “all-in-one-box” sweepstakes. Their new AW4416 audio workstation turned quite a few heads. It contains a complete recording studio with 16 tracks, the guts of an O2R console with motorized faders, and a complete mastering section with a CD burner. Additionally, it has a slot-based input/output architecture with your choice of ADAT, Tascam, converters, etc. Curiously though, this is one of the few units that decided to forego the 96 kHz rate, settling instead on the more compact 24/48 format. Unfortunately, they only had a partially working prototype on the show floor, but from what I could hear it sounded excellent.

Over in the other corner, Tascam and Mackie were battling it out for the removable-drive championship. The new contender, Mackie’s HDR24/96, is an impressive unit, and its stated purpose in life is to end the era of tape-based recorders, digital or otherwise, once and for all! That’s a pretty big stake to claim, but who knows, they might just pull it off. A key ingredient to their strategy is the introduction of a new hard-disc cassette format they intend to market and sell in the same fashion as VHS tape in music stores and maybe your local supermarket. No more megabytes for these people: hours and minutes is the only information you’ll get here. Apart from their marketing strategy, Mackie certainly didn’t miss a beat with this attractively designed 24-track recorder. Attach a monitor, mouse, and keys to the unit, and you have full access to its comprehensive editing features. You can chain as many of them as you want, with sample-accurate synchronization, of course, using an ordinary tip-ring-sleeve cable (or so they claim)!! Other features of note: compatibility with just about every synchronization method known, Apogee converters, slot-based input/output architecture, and a remote control unit are available. All this for a suggested retail price of US$ 4,999.

If you are anything like me, you will agree that the mouse is probably the worst device for controlling software faders and knobs on the screen. If not hastening an impending carpal tunnel disaster, then at best it is simply cumbersome, finicky, and downright unmusical. Sure, there have been MIDI controller boxes before, but in my opinion these just haven’t lived up to the demanding task of interfacing to digital audio workstation software. Well, finally some manufacturers have caught on to this rather obvious idea. The unit that caught my eye (and hands) at the show was the SAC-2K from Radikal Technologies. It interfaces automatically and seamlessly to all the major software brands through fast USB ports, has smooth and professional-feeling motorized faders, automatic readout of track names, etc., on a number of liquid-crystal display screens, and generally maps just about anything you need onto its control surface. This unit soared right to the top of my wish list!

CM Automation is also in this game, announcing their new 2000 Dashboard Digital Editor Worksurface, a companion to their Motor-Mix fader box released in 1999. This unit is designed to do editing work of the cut-and-paste variety. Combined with their motorized faders, all of which can be linked to form an impressive “console-like” surface, this makes for an impressive interface to the software of your choice. My only reservation is...
that the computer connection is via MIDI only, which in my experience has not been fast enough for transparent fader control.

The big splash at this year’s NAMM show was generated by Rocket Network, who chose this venue for their official launch of the Internet Recording Studio, a set of software modules and protocols that enables seamless transfer of synchronized audio over the Internet. If you have done any kind of distance collaboration, you will immediately appreciate the enormous amount of hassle this could save you and your partner(s). In a rare show of cooperation, arch rivals Steinberg and Emagic both showed Rocket working within their audio sequencers. Digidesign has also entered the fray, and Euphonics has announced support as well. No doubt more players will come on-board as this ride is sure to gain some serious momentum.

Rocket intends to be much more than just a behind-the-scenes software provider, however. It is now busy setting up a worldwide network of studios and individual Rocket-enabled sites. You need a track of Norwegian fiddle tuned to quarter tones for your ongoing session? Just post it and reel in the tracks. During the big launch party, we were treated to a live studio recording occurring in three different locations. On hand were jazz greats Herbie Hancock, Marcus Miller, Wah Wah Watson, and Chico Freeman. Amazingly, the tracks came together perfectly synchronized, with no crashes, outages, or terminally slow downloads. Backed by super-millionaire Paul G. Allen’s Vulcan Ventures, there is enough muscle behind this enterprise to make it a force to watch closely in the months ahead.

One nice addition to NAMM this year was the “museum of vintage synthesizers” [or something to that effect]. Of special note to us old synthesizer freaks was the very first prototype of the MiniMoog. I just can’t help being somewhat in awe of an object of such uniqueness and historical importance. Bob Moog himself was on hand to deliver a spirited recounting of the days when it all happened.

Fourth Annual Mathematical Diderot Forum: Mathematics and Music

Institut de Recherche et Coordination Acoustique/Musique (IRCAM), Paris, France, 3–4 December 1999

Reviewed by Marc Chemillier
Caen, France

The cycle of Diderot Mathematical Forums, held under the authority of the European Mathematical Society (EMS), features one conference a year taking place simultaneously in three European cities linked by telecommunications. Each cycle addresses three different aspects of the discipline: fundamental mathematics, mathematical applications, and the relation of both to society. The subject of the Fourth Diderot Forum was Mathematics and Music. It was held in parallel in Lisbon [organizer: Jose-Francisco Rodriguez], Vienna [organizer: Hans Feichtinger], and Paris, on 3–4 December, 1999. This review deals with the Paris forum, which took place at IRCAM and was organized by Gérard Assayag [IRCAM] and Laurent Mazliak [Université de Paris VI].

The specific theme of this conference was Mathematical Logic and Musical Logic in the 20th Century. The scientific and musical committee included, in addition to the organizers, Marc Chemillier, Laurent Fichet, François Nicolas, and André Riotte. Four sessions were scheduled: (1) historical perspectives about both formalization of logic and formalization of music in the 20th century, (2) implicit computation and unconscious computation in relation to ethnomusicology and cognitive science, (3) formal systems and their application to computer-assisted composition software, and (4) the limits of formalization.

The conference was introduced by Jean-Pierre Bourguignon [president of the EMS] and Laurent Bayle [director of IRCAM]. Mr. Bayle noted that while mathematics is not a subject studied in itself at IRCAM, it appears as a transversal discipline involved in many different domains from sound synthesis to computer-assisted composition. Mr. Bourguignon pointed out that this edition of the Diderot Forum has focused on the relation between mathematics and music in a much deeper way than preceding ones had focused on the relations between mathematics and other domains (finance in 1996, environment in 1997, and culture in 1998).

At the end of the first day, a videoconference [sponsored by France Télécom] provided a meeting point for the three forum locations: Paris, Lisbon [where the theme was Historical Aspects of the Relation Between Mathematics and Music], and Vienna [where the theme was Sound Processing]. Paris participants in the round table included Daniel Andler [cognitive science], Simha Arom [ethnomusicology], and Guerino Mazzola [mathematics and music], with Mr. Bourguignon as moderator. The Lisbon participants were unfortunately lost soon after the exchange began, due to technical problems typical of this kind of experience.

The session on Historical Perspec-
tives began with a presentation by Marie-Josée Durand-Richard on the formalization of logic since the work of George Boole. This was followed by Laurent Fichet, who, speaking from a critical perspective, gave examples of formal musical analysis of pieces inspired by set theory (such as Piano Sonata no. 2 by Pierre Boulez).

The second session, Implicit Computation, Unconscious Computation, addressed the question of whether mathematical structures exist only in formalized music or in all types of music. The speakers were Daniel Andler, who gave a brilliant lecture on the cognitive framework of this question, Marc Chemillier, who presented examples taken from sand drawings of the Vanatu, harp music from the Central African Republic, and polyrhythmic music from the Aka pygmies, where “ethnomathematical” structures can be found, and Marc Leman, who explained how formal logic can be used as a meta-level description system for understanding what he calls “musical images,” a model of music perception.

The session on Formal Systems presented a collection of mathematical models underlying computer-assisted composition systems. Mikhail Malt gave an overview of mathematical models used by Iannis Xenakis in his compositions, and demonstrated a recomposition of the piano piece Herma using OpenMusic, software developed at IRCAM. Yann Orlarey presented Eloyd, an impressive composition software developed at GRAME [Centre National de Création Musicale, Lyon], which is entirely based on the lambda calculus. Guerino Mazzola gave a lecture on the sophisticated mathematical tools, including Grothendieck’s factorial algebraic geometry and Lawvere’s topos theory of logic, that he has used in the implementation of music software such as Rubato. Shlomo Dubnov described the use of information theory for discovering hidden structures and redundancies, and presented research done in collaboration with Mr. Assayag on statistical learning methods applied to music generation, illustrated by an amazing computer-generated pastiche of J. S. Bach’s Musical Offering. At the final session, The Limits of Formalization, François Nicolas gave a lecture with the Ensemble InterContemporary, about the way the electronic part is provided technical explanations about the way the electronic part is based on recording, transforming, and playing back in real time the music performed by the soloist.

Altogether, the forum was well attended, with approximately 120 participants. The proceedings are to be published by Springer-Verlag [for further information on the Diderot Forum, visit the World Wide Web site www.ircam.fr/equipes/repmus/diderot99/EnglishPage.html].

### Publications

**Martin Russ: Sound Synthesis and Sampling**

Softcover, 1996; ISBN 0-240-51429-7; 400 pages, illustrated, time lines, review questions, glossary, index, Focal Press/Butterworth-Heinemann, Linacre House, Jordan Hill, Oxford OX2 8DP, UK; telephone [+44-1865] 314627; fax [+44-1865] 314091; electronic mail bhuk.orders@repp.co.uk; Focal Press, 225 Wildwood Ave., Woburn, Massachusetts 01801-2041, USA

Reviewed by Shlomo Dubnov Tel Aviv, Israel

**Sound Synthesis and Sampling**, by Martin Russ, is all about the principles of sound synthesis in electronic musical instruments. In a little less than 400 pages, the author provides a technical and historical overview of the various sound-synthesis methods. Starting from early tape manipulations through analog synthesis, digital sampling, and the latest physical modeling techniques, the book offers a comprehensive introduction to the main methods of producing and manipulating sound. The eight chapters are organized into five major divisions: an introductory chapter, four chapters describing synthesis techniques, two applications chapters showing the use of synthesis for musical needs, a summary/discussion chapter, and finally a comprehensive reference section containing a glossary, list of jargon, and index.

Presented in nonmathematical fashion and extensively illustrated, this appears to be an excellent reference book for researchers and musicians, or a supplementary textbook for a course on sound synthesis. En-
riched with a substantial glossary and time-line charts that mention key events in the history of sound synthesis, the book contains all the ingredients for a comprehensive survey of the field. Although it focuses mainly on commercially available synthesis solutions, it does not forget to present some of the more experimental laboratory methods that have not yet hit the commercial market.

*Sound Synthesis and Sampling* begins with an introductory chapter that from the start puts the subject of synthesis into the context of a “creative bringing together” of sound components, presenting the important conceptual dichotomy between synthesis model and interface abstraction. The synthesizer structure is divided into two basic functional blocks: a control interface that provides the parameters for a synthesis engine, and an engine module that interprets the parameters and generates sound output. This structure is used throughout the book as a reference for synthesis models. Certain conceptual categories of sound are suggested that basically distinguish between imitative and synthetic sounds, claiming that “the general public seems to expect synthesizers to produce synthetic sounds.” One of the author’s goals is to stress the importance of the creative use of the reproduction methods, then, appear not to be as interesting as the purely “synthetic” methods. On the other hand, we all witness how advances in research toward the understanding of real sounds or traditional music help musicians develop new means for their artistic expression. To this extent, the author correctly indicates that physical modeling could be one approach that blurs the difference between what is natural and what is synthetic.

Chapter 2 enters the world of synthesis by presenting analog synthesis methods. It identifies voltage-controlled oscillators [VCO], filters [VCF], amplifiers [VCA], and low-frequency oscillators [LFO] as the basic components. By means of time-varying envelopes, triggers, and LFOs, the author explains how the frequency contents (timbre) and amplitude are controlled. In this chapter, basic acoustical and signal-processing terms are introduced. These include the different types of filters (low pass, high pass, band pass, and notch), basic waveforms (sinusoidal, triangle, square, etc.), modulation effects, and so forth. The relationship between waveform and harmonic content is explained.

Some simple experiments that demonstrate basic acoustic phenomena, such as the creation of beats, vibrato, and tremolo, are suggested. Then, more advanced methods such as additive, frequency modulation [FM], and even formant synthesis are presented, together with the more traditional analog methods such as amplitude and ring modulation. Basic problems of control and the concept of MIDI are also introduced in this chapter. The final paragraphs demonstrate the use of the analog sound-generation/manipulation methods in historic commercial products: Moog [1965], Yamaha CS-80 [1978], Roland SH-101 [1982], and Oberheim Matrix [1984].

The problem with entering the world of synthesis through the analog door is that this approach could become rather confusing for an uninitiated reader. Historically, one might justly claim that all music-synthesis ideas, including today’s “hot” digital analysis/synthesis methods, have already appeared in the analog world. Nevertheless, it is clear that the amount of detail, precision of control, and level of understanding of the inner structure of sound are much more evident and advanced in the digital synthesis era.

Chapter 3 considers the methods of synthesis prevalent during the shift from analog to digital in the early 1980s. These include programmable analog monophonic synthesizers, digitally controlled oscillators in analog synthesizers, and analog modifiers of digital oscillators. Technically, the chapter offers a gentle introduction to sampling through a series of simpler methods such as wavecyles and wavetables (tables of wavecycles). Basic concepts of memory storage, frequency shifting for variable frequency playback, anti-aliasing filters, and questions of quality are thoroughly discussed. The hybrid scheme consists of a sample source playback (a digitally controlled oscillator [DCO]), a digital-to-analog converter [DAC], and analog filters as the final stage modifiers. There are also brief discussions of a number of instruments, including: Fairlight CMI [1979], PPG Wave [1982], Roland Juno-60 [1982], Roland D50 [1987], and the “redesigned” PPG instrument, Waldorf MicroWave [1989].
Chapter 4 is devoted to sampling technology. But instead of proceeding in a chronological manner, following on from the hybrid techniques presented in the previous chapter, the discussion digresses to tape techniques, mellotrons, and early methods of analog sampling. It is not clear why the author chose to “restart” the presentation in this manner. Since the whole book is more or less constructed chronologically, I find the consideration of tape techniques and similar older sampling ideas a little confusing. Many of the sampling basics, such as storage, pitch shifting, etc., are reintroduced in this chapter. The important ideas presented here are sample recording, editing, and RAM (instead of ROM) storage to enable the writing of samples to synthesizer memory.

Chapter 5 provides an overview of the most current synthesis methods. The first paragraph explains the basics of FM synthesis without going into much of the mathematics, though Bessel functions are mentioned by way of an analogy with filters. Instead of time or control voltage, Bessel functions here become black boxes controlled by a modulation index. The further away from the carrier frequency, the higher the control value needed to have an effect. This analogy, although possibly useful for didactical purposes (viewing FM as a tool for controlling timbre), might be confusing for those attempting to acquire a deeper level of understanding. Different FM operators are reviewed and demonstrated with the Yamaha FM algorithm.

The next topic to be covered is waveshaping, encountered commercially in the Casio CZ-series of synthesizers. Chebyshev functions are mentioned as the basic building blocks that control the sound’s spectral composition. The waveshaping building blocks consist of a DCO followed by a digitally controlled waveshaper (DCW), the DCW being analogous to the VCF encountered in analog synthesizers. Both FM and waveshaping are complex techniques, and these sections provide a good overview of the basic components, with lots of intuitive tips that should help put the reader on track for working with these nonlinear synthesis methods.

The last section of this chapter explains physical modeling. The idea of mathematical models that can be built to simulate the sound of instruments is presented by introducing several model types: (1) those the author calls “interaction emulation,” better known as source-filter models, which separately recreate the excitation and the resonator parts of the sound, including an optional coupling part that links the changes of excitation to changes in the resonator; (2) continuous models that deal with blown or bowed instruments using a physical model to create the excitation; and (3) impulse models for plucked or struck instruments, such as the Karplus-Strong algorithm. The principles of these different models are presented in a clear, nonmathematical style, and concerns relating to the implementation complexity of these models are discussed.

Other synthesis models presented by Mr. Russ include granular synthesis, formant synthesis (FOF), vocoders and voice simulators (VOSIM), and analysis/synthesis techniques. The underlying complexity and sophistication of these models, however, make a detailed presentation beyond the scope of the book. Examples of new synthesizers mentioned in this chapter include the Yamaha SY99 and SY77 as combinations of FM, sampling, and resonant filters for dynamic timbral changes. The Yamaha VL1 [1994] physical-modeling synthesizer is also presented, along with the Technology WSA1 [1995], which combines physical modeling with sampling and includes programmable resonators that provide the “interaction” between the excitation and resonator parts of the model.

The next section of the book is, in my opinion, one of its main original contributions: a discussion on the artistic uses of sound synthesis. This aspect is usually overlooked in computer music books, and only a few treatises dare to confront this important point. Methods of stacking, layering, and hocketing are suggested as the basic approaches for arranging synthetic sounds. Layering concerns the use of time-varying envelopes, and it is conventionally related to methods of building sounds so that one sound is used to provide an initial attack while others are used for the sustained or decay portions. This method of creating complex sounds is particularly effective with slowly evolving sonorities. Stacking concerns the combination of different timbres, something like orchestration principles for acoustic instruments. Principles of contrasting timbre combinations are presented, along with methods for doubling, harmonization, and detuning/choring. Hocketing concerns techniques of arpeggiation or fast, closely spaced imitation. Moving notes or note parameters between tracks can create a complex detailed arrangement. For instance, slight shifts between similar types of sounds can produce ensemble effects or provide a sense of movement. Another interesting technique is the use of velocity to allocate notes to different instruments. This method is suggested to be effective for sounds that move between accompa-
niment and melody. It can also be used as a mixing control rather than dynamics control. Multi-timbrality and polyphony are discussed in depth, as are the technical constraints on voice allocation and resources for synthesizers with limited capabilities.

The types and uses of effects are discussed as well, another important and original contribution. Artistic tips on the proper use of reverb, chorus, echo, flanging, pitch shift, and distortion are very enlightening. Sound editing, control, and programming are presented along with the use of librarians for properly managing the synthesis and composition production.

The penultimate chapter concerns the use of sound synthesis in performance. Separating the controller from the sound-generating mechanism requires a keyboard or alternative controller (wind, guitar, drum machine). MIDI is discussed as the standard form of communication between the controllers and the sound modules. A list of the most common controllers is provided (in reality, one must find out which is implemented for each synthesizer, and how it actually operates). ZIPi enhancements are also briefly mentioned as a possible future contribution. A general evaluation of the use of controllers is provided, indicating that the keyboard is better for complex polyphonic performances, while the wind controller provides better expression control and drums better triggering.

The final chapter is a short summary that basically presents the author’s views about the past and future of the field. The author predicts that the synthesizer will become part of a larger “multimedia” facility, which is indeed happening within the current structured-audio MPEG-4 activity. On the other hand, I dispute his opinion that the technology has reached a point where quality is no longer a problem. The author suggests that apart from minor improvements to the details of synthesis techniques, the only “open” problem left is the performer-instrument interface. I am not at all sure that the solutions to synthesis problems are solely dependent on the controllers. Significant advances have been made in understanding musical gestures, but any information derived from a complex action must be properly translated into synthesis parameters. Physical models have not yet reached a state where all synthesis tasks can be achieved within this framework. They are probably too complex to allow a simple low-dimensional control. Better models for sound definition and sound sharing must be defined, with lots of work still to be done to create an optimal balance between model complexity and ease of control. Better models of performance or expressive control of sound synthesis are needed, and these might provide the “missing link” between control and synthesis. The book appears to have been written in the period (mid-1990s) when the promise of physical modeling seemed to overshadow all other problems in sound synthesis. I think today we realize that much more work remains to be done.

In conclusion, Sound Synthesis and Sampling provides an excellent technical and historical overview of sound-synthesis methods in a nonmathematical fashion. The book offers a comprehensive introduction to the main methods of creating sound, from early tape manipulations to the latest physical-modeling and mathematical techniques. Although carefully presented and quite extensively illustrated, my impression is that the book might be rather difficult for the uninitiated reader. The abundance of technical details and the introduction of so many new concepts is quite overwhelming. The variety and complexity of tools presented in the book is indeed abundant, but the final results still remain rather vague (unless the reader is already an expert). The two chapters that present musical applications hold promise, but they are much too short and insufficiently supported with examples or demonstrations. It would be a great challenge to see the subject of Chapter 6 be developed into a complete treatise, supplemented with score excerpts, recorded examples, and the like.

This book should be a good reference for researchers and musicians, and a fine supplementary textbook for a sound-synthesis course. It lacks pointers, however, to the many freely available software-synthesis programs, bibliographical references, and other publications. It is thus clearly oriented toward commercial hardware-synthesis products. My last remark is that a book of this kind should provide sound examples, to give voice to the otherwise obscure methods and “mute” sounds.

Marc Treib: Space Calculated in Seconds: The Philips Pavilion, Le Corbusier, Edgard Varèse

Iannis Xenakis is well known as a composer and computer music pioneer. He is also known, at least in music circles, as an architect (his design work is much less discussed in the architectural world). Much of this aspect of his reputation rests upon the work he did with Le Corbusier, and the major project he worked on is the Philips Pavilion, built for the 1958 World Exposition in Brussels. What we know about this edifice comes to us mostly from Mr. Xenakis himself, as disseminated in his own writings and in the biography by Nouritza Matossian. The Philips Pavilion stood for less than a year, so for scholars assessing the work of Le Corbusier, it is considered a minor work, often not mentioned at all.

The controversy over authorship of the Philips Pavilion is also well known from Mr. Xenakis’s accounts. The employee, who clearly carried out most of the design and coordinated a great deal of the engineering, chafed at his enforced anonymity. Finally, he called for public acknowledgement of his contribution, which he did eventually receive. Bitterness remained, evidently, and Le Corbusier released Mr. Xenakis from his duties the following year. From that point on, to the immeasurable benefit of the musical community, the composer-engineer-architect devoted himself to music.

This book by Marc Treib, published in 1996 (but somehow escaping our notice), gives us a meticulously researched, balanced account of the genesis of the Philips Pavilion and a lucid and informed assessment of its innovation and importance. It is a rare pleasure, I must say, to come upon research of such insight and care, presented with clarity and enthusiasm. Mr. Treib, professor of architecture at Berkeley, is well respected in his domain, and is the author of a number of other studies.

In spite of the ephemeral nature of the architecture, the genesis of the Philips Pavilion has been extremely well documented. Louis Kalff, the director of the project for the Philips Corporation, saved copies of all correspondence and documentation, and Le Corbusier, too, preserved his sketchbooks and much of the design materials from his office. Mr. Treib has worked his way through all of these documents, along with much else. He also enlisted the aid of Berkeley colleague Richard Felciano (professor of music) to present sketch material pertaining to the tape composition Edgard Varèse created for the Philips Pavilion, Poème électronique. Considering the importance of this piece in the history of electroacoustic music, that chapter is fascinating on its own. One finds details of the spatial distribution of the tape over the four hundred (or so) loudspeakers installed in the pavilion. The routing equipment was created specially for the presentation, so in an important sense, this tape piece has not really been properly heard since. It is particularly interesting to see Mr. Varèse’s sketches, just to gain some insight into how he thought about the sounds and how he organized them. This, it must be remembered, was his first composition entirely for tape, and he created it essentially on his own. The Philips technicians had little understanding of (or sympathy for) his music or compositional process. (Philips had originally proposed Benjamin Britten as the composer for the project, an indication of the gap between the commissioners and the creators. Both Le Corbusier and Mr. Xenakis were continually reassuring the directors as to Mr. Varèse’s suitability, and the architect had to make it conditional upon his own participation to force Philips to acquiesce.) When Edgard Varèse composed Déserts, for ensemble and tape, he worked in Paris at the studios of the Groupe de Recherches Musicales (GRM), where he was assisted by musically trained, sympathetic technicians such as Pierre Henry.

Le Corbusier, who considered himself more of an “artist” than an “architect,” was much more concerned in this project with the multimedia presentation within the pavilion than he was with its housing. His initial conception of the floor plan in the shape of a stomach (a curved design with funnels for getting the spectators in and out) was given to Mr. Xenakis, who conceived the striking hyperbolic paraboloids for which the pavilion is known. Mr. Treib’s research shows, however, that Le Corbusier was kept apprised of (and gave his approval to) all of the plans and discussions as they progressed, even...
though he was spending long periods in India supervising the construction of the city of Chandigarh, his grandest project.

Along with Mr. Xenakis, Mr. Varèse, the technicians at Philips, and the engineering firm responsible for constructing the edifice itself, Le Corbusier also enlisted the aid of film director Philippe Agostini and author/graphic designer Jean Petit to assist him in the realization of the lighting effects and the projected images. Mr. Treib carefully studies the contributions of each, and assesses their work in the light of the various influences current at that time. The film, as it ultimately took shape, owed much to the experimental work of Sergei Eisenstein, Luis Buñuel, and Fernand Léger (Ballet mécanique). The remarkable feat of engineering that saw the construction of the pavilion from a thin layer of prestressed concrete [for which Mr. Xenakis has taken much credit] turns out to have been a particular specialty of H. C. Duyster, the Belgian engineer who not only oversaw the project, but found a way to do it when others said it was impossible. To his credit, Mr. Xenakis, with his engineering background, understood the difficulties and the advantages of the paraboloid design, and would no doubt have been better able to communicate with the engineers than another architect with a less technical background [such as Le Corbusier himself]. It is also interesting to note that the hyperbolic paraboloid was all the rage at that time—some of the other pavilions at the exposition in Brussels also incorporated these curves into their designs. The Philips acoustician, Willem Tak, was instrumental in the design of the large, complex sound system [though there again, Mr. Xenakis, with his interest in music and his experiments in the studios of GRM, was closely involved in this aspect of the project as well].

The book is especially valuable for its reproduction of numerous photos of the pavilion, and for images from the film that was projected inside, the lighting effects, the stages of construction, and so on. Considering that the building is no more, these documents are all the more important. And for those of us who have only read about it (and most of us have only read about it through the subjective slant of Mr. Xenakis), it is wonderful to be able to see views of the Philips Pavilion and details of the Poème électronique. That title, incidentally, was conceived by Le Corbusier for the entire multimedia performance. Most of us remember it only as the title of the piece by Mr. Varèse.

Perhaps most remarkable in the whole story of the Philips Pavilion is the courage and vision shown by Mr. Kalff, of Philips. The pressure he was under must have been enormous, given the perpetual tardiness and problems of the creators, and the worried rumblings from the directors of the corporation. The pavilion and the display within it were memorable for their bold vision and creative engagement. This was no mere display of the latest gadgets [as is so often the case at these expositions]. For most of us, the Cold War “one-upmanship” of the American and Soviet pavilions have long been forgotten. The Philips Pavilion and the Poème électronique are all that we remember from that event. And for us musicians, even if Mr. Xenakis may be seen to have somewhat overstated his own case, his little electroacoustic gem, Concrète pH, created for the interlude between presentations of the main event, and Edgard Varèse’s piece remain important works in the history of electroacoustic music. Thanks to Mr. Treib, we now have a much more nuanced context within which to understand how they came to be.


Softcover, 1999; ISBN 0-89579-438-1; 463 pages; illustrated, glossary, bibliography, name index, subject index; A-R Editions, Inc., Madison, Wisconsin 53717-1903, USA; telephone (608) 936-9000 (USA only 800-736-0070); fax (608) 831-8200; electronic mail orders@areditions.com; World Wide Web www.areditions.com/cmdas/cmdas015.html

Reviewed by Daniel Hosken
Northridge, California, USA

The Digital Audio Music List (DAML) is Volume 15 of the venerable Computer Music and Digital Audio Series (CMDAS) from A-R Editions. This series is quite eclectic, ranging from such brass-tacks works as Ken Pohlmann’s Compact Disc Handbook to the more iconoclastic Computers and Musical Style by David Cope. There are few preset notions one can have about a CMDAS volume. Nevertheless, they have generally been technically oriented works aimed at the professional, or textbooks aimed at college-level students. Digital Audio Music List goes against that grain, to some degree, by targeting a consumer audience: the mid- to high-end home-audio crowd.

This book’s primary purpose is to present reviews of technically excellent recordings. It can be broken down into two distinct sections. The first consists of 8 chapters comprising 68 pages of preparatory material.
necessary to understand the issues involved in the reviews. The second consists of two chapters, “Ratings: Classical,” and “Ratings: Popular and Jazz,” comprising 228 pages. These two sections are followed by six appendices comprising 110 pages. These page counts reveal the core material of this book: technical reviews of digital audio recordings.

The overall concept is a bit curious—why a book of reviews that are solely technical? Howard Ferstler reveals his purpose in the introduction: “The problem with most record reviews is that the people who write them often fail to mention whether a recording’s technical quality is bad, good, or even decent.” Digital Audio Music List is clearly designed to remedy this perceived problem. The author delineates three functions for his text in the introduction: “First, technologically good recordings give listeners an idea of what is possible in modern home audio.... Second, decent recordings are mandatory when evaluating audio hardware.... Third, good recordings are useful for setting up equipment on hand.” It is clear that the home-audio listening environment is the central focus here, and that the primary audience is an “audiophile” audience. Fortunately, Mr. Ferstler has restricted himself to digital recordings so the traditional audiophile analog vs. digital debate is not revisited.

The core of the preparatory material is aimed at presenting background for the five basic criteria used to evaluate recordings: “(1) soundstage width, depth, and spaciousness; (2) instrumental transparency and delineation; (3) vocal and instrumental realism; (4) dynamic range; and (5) wide-band frequency response.” The three substantial chapters of this section discuss “Tools, Techniques, and Microphones,” “The Speaker/Room Interface,” and “Surround Sound and Its Impact.” The “Tools, Techniques...” chapter sketches out the basic “purist” microphone techniques, including variations on spaced-array and near-coincident configurations. Mr. Ferstler argues that purist techniques are usually necessary to satisfy the above-named criteria. This chapter also includes a discussion of various 18+ bit technologies and largely dismisses them as unnecessary: “A perfectly aligned, 16-bit DAC [digital-to-analog converter] should be able to deliver 96 dB of dynamic range, near-perfect linearity, and inaudible distortion.”

The “Speaker/Room Interface” chapter covers issues related to the layout of the home listening environment, and discusses both optimal and practical configurations for perceiving the various qualities of a recording (or “transcription” as the author likes to put it). Of particular interest here (and in the reviews) is the issue of a realistic soundstage. The “Surround Sound” chapter discusses the basics of synthesized am-bience and Dolby Surround (Pro Logic) that are popular in high-end home audio, and the impact of such processor/decoders on the soundstage of nonencoded two-channel material. Mr. Ferstler is careful here to distinguish between Dolby Pro Logic and the Dolby Digital Surround and Digital Theater Systems that are largely the domain of motion picture and home video.

The two large sections of reviews—classical and popular/jazz—follow this preparatory material. True to his word, the author sticks to the technical aspects of each recording, usually focusing on the soundstage and the effects of various Dolby Surround decoder and ambience processor settings. During the course of the reviews, several trends become prominent: a short list of reliable “purist” engineers and a short list of reliable “purist” labels. Quality recordings that include neither of these purist entities are noted with some surprise. The chosen recordings include a wide variety of ensembles, recording environments, and repertoire. No particular trend in the choice of repertoire sticks out: there are 3 recordings of Mahler’s Fifth Symphony but none of Beethoven’s; 14 recordings of Stravinsky and 1 of Schoenberg; 6 recordings of Flim and the BB’s and 1 of Pat Metheny.

The six appendices that follow include an annotated list of journals/magazines that include record reviews, a detailed list of the audio hardware used for the evaluations, a brief discussion of processors, a list of test/sampler recordings, a list of discrete-channel surround-sound recordings (e.g., Dolby Digital), and a list of recordings that Mr. Ferstler came across after the manuscript of the book was finalized. A glossary, bibliography, name index, and subject index round out the book.
I found that the key to understanding where this book was coming from was to read the subtitle carefully: “a critical guide to listening,” not “a guide to critical listening.” Pedagogy is not really the goal here. The book is primarily designed as a reference source for good recordings that you can buy if you are buying or testing a home-audio setup or if you just like technically good recordings whether they are of Bruckner or Enya. In that light, the book seems to fulfill its mission—there is a big list of technically good recordings here. The question that remains is whether or not this really needs to be collected in a $30 book.

One of the author’s justifications for writing a book of solely technical reviews is to counter the prevalence of solely aesthetic reviews. Mr. Ferstler makes the claim that “no professional critic will always fairly judge the artistic qualities of a recording. After all, you like the type of music you like, I like what I like, and a professional record reviewer may like something completely different.” This glib dismissal of aesthetic evaluation is followed by a claim of objectivity regarding technical reviews. The message is that we can’t know whether a performance or a work is good or bad because of the subjectivity problem, but we should know if the recording is good. Unfortunately, this leads to a series of reviews that serve only limited purposes. While these reviews may be of value to an audiophile, in the absence of any aesthetic evaluation of the performance or work involved, these reviews are of only a little value to anyone else. Personally, I would want to spend quite a bit of time cross-referencing the recordings listed in this book with reviews in Fanfave or other such review publications before purchasing any of these recordings.

I wouldn’t find this to be a devastating problem if the preparatory material were more substantial. A solid, well-organized technical or quasi-technical treatise on issues of quality recording followed by a very select list of works that exemplify the quality criteria could constitute a useful book for many musicians and would serve to wake them up to the technical qualities of the recordings that they care about. As it stands, this preparatory material is generally journalistic in tone, eschewing in-depth discussion or technical explanation in favor of generalizations and rules of thumb.

An additional problem with the reviews themselves is the matter of selection. There are a large number of reviews [and an appendix of additional reviews], but it’s not clear what superset they were chosen from. Were these chosen from all digital recordings? All recordings available at a certain library? All recordings from certain labels? If there were fewer reviews chosen specifically to demonstrate certain quality criteria or a basic set of ten or a hundred quality recordings for testing purposes, then the issue of selection would be clear. In this case it appears that the author listened to “lots” of recordings and chose the ones he liked technically. A smaller, more focused selection coupled with in-depth preparatory material would be a better primer on recognizing good recordings and a valuable reference source for a manageable number of these recordings. The argument could also be made that a less focused group of reviews such as those in DAML would be better placed in review periodicals than in book form.

Apart from my qualms about the structure and focus of the book, there are several additional problems with the layout. Of the eight initial chapters, four consist of three pages or less. This may appear trivial, but it bespeaks a lack of clear organization of the material. The content of these tiny chapters bears this out: the two-page chapter entitled “Analyzing Nonelectrified Vocal Music” seems only to say that some poor recordings warp the stage sound by making the singers subjectively too large and some recordings blur the diction of the singers. This discussion would better fit into a single chapter dedicated to special ensemble concerns; a chapter like that would also encompass another tiny chapter, “Analyzing Popular-Music Recordings,” and material scattered in other, larger chapters.

A small quibble is that all figures are placed at the ends of the chapters, disrupting the flow of reading. A larger problem related to the figures is that several of them have multipage captions in small print. This material, some of which reaches usefully technical levels, should clearly be integrated into the body of the text itself.

Overall, I don’t find the Digital Audio Music List to be a worthy addition to the Computer Music and Digital Audio Series. For computer musicians there is little of technical interest and, by design, nothing of aesthetic interest. For musicians in general, the lack of aesthetic criteria in the reviews and the lack of a clear pedagogy regarding critical listening leave the book with little value. For people interested in the issues surrounding “purist” recordings, there is some useful material, but it lacks good organization and depth—other sources [including Mr. Ferstler’s other books, to which he frequently refers] might provide more in-depth and focused information. For people buying or testing home-audio equipment, DAML provides a list of good recordings to use, although reviews
in several different periodicals might also suffice. For home-audio enthusiasts, it provides a one-stop resource for quality recordings that have been reviewed by a single person, eliminating some of the trouble of searching out such reviews.

Jennifer A. Lennon: Hypermedia Systems and Applications: World Wide Web and Beyond

Softcover, 1997; ISBN 3-540-62697-2; 297 pages; illustrated, bibliography, index; Springer-Verlag, Tiergartenstrasse 17, D-69121 Heidelberg, Germany; telephone (+49-6221) 487-235; electronic mail orders@springer.de; World Wide Web www.springer.de

Reviewed by Douglas Geers
New York, New York, USA

In her book, Hypermedia Systems and Applications: World Wide Web and Beyond, Jennifer Lennon attempts to codify the current state of the art in hypermedia technologies. The text, aimed at nonexpert readers, functions rather well as a source of introductory explanations with a large number of references for further study. Given, however, the pace that these technologies are evolving, writing a book such as this is a brave and tricky task. This and several other factors make it a bit problematic, as I will explain below.

Although I am a composer who has been delving into multimedia composition over the past several years, I must admit that I did not know the exact meaning of the term “hypermedia” when I first opened Ms. Lennon’s book. So for the sake of others who also may not be sure, let me begin by supplying her definition: “multimedia, with links, embedded in a network.” That is, hypermedia exists when multimedia objects (she defines multimedia as “a rich combination of text, graphics, pictures, video, and audio, in digitized form”) are combined in a single, linked network.

Hypermedia seems designed as an undergraduate textbook, and indeed, in his foreword to the book, Hermann Maurer mentions that he has used it for a one-semester course entitled Networked Multimedia Systems. The book covers a wide range of topics relating to hypermedia, including history, concepts, hardware and software implementations, trends, and predictions of where the technology is headed. These, with a few notable exceptions, are treated concisely, though not exhaustively. Generally, the assumption is that the reader has little or no knowledge of the subject, though again there are exceptions. I think that with a good instructor to explain some of the technical language and ideas, this book could be used as a text for non–computer science students such as composers, visual artists, and multimedia artists.

Hypermedia is structured in clear outline form, divided into three main parts: “Introduction to Hypermedia Systems and Their Applications,” “Web Technologies,” and “Advanced Applications and Developments.” These parts are subdivided into series of chapters, the chapters into numbered sections, and the sections into ideas presented as chains of short, easily digestible, numbered paragraphs.

The first section, “Introduction to Hypermedia Systems and Their Applications,” is the most successful, especially for use in conjunction with classroom teaching. It begins by introducing the major ideas that the book will cover (Chapter 1).

These concepts include hypermedia, hypertext, interactive movies, threedimensional models, and electronic personal assistants. Chapter 2 presents a brief history of multimedia and hypermedia concepts and systems, highlighting a total of 16 thinkers and developers—sometimes groups of people—and their innovations, including such luminaries as Vannevar Bush, Douglas Engelbart, Janet Walker, and Bill Atkinson. Personally, I found this chapter to be the most entertaining of the entire text, though Ms. Lennon’s descriptions of what exactly was achieved technically and/or conceptually are often so brief that the accomplishments themselves do not seem adequately clarified. To her credit, the author does state that she would have liked to give more space to this history. It is a shame she was not able to; this history is not only intriguing but is also the segment of the text that will retain its utility the longest as the technologies and methodologies of hypermedia continue to evolve.

Chapters 3–5 introduce the Internet and concepts of hypermedia related to it. Chapter 3, “The Internet: A First Glance,” offers a brief introduction to the historical development of the Internet and associated applications and protocols such as Transmission Control Protocol/Internet Protocol (TCP/IP), area networks, firewalls, client/server architectures, electronic mail, ftp, Telnet, and more. These discussions are indeed glancing, and often are so slight as to be nearly meaningless. In her description of area networks, for example, Ms. Lennon mentions but does not define the ring, tree, and bus topologies of a local area network (LAN), wide area networks (WANs), and packet switching. It would have been much more rewarding for read-
ers if she could have taken time to at least define, if not to explain, terms introduced.

Indeed, this lack of explanation recurs in several places throughout the book and is a serious shortcoming. As it is, readers—especially if they are of the apparently targeted audience, novice undergraduates—will be repeatedly frustrated by the barrage of technical terms with no clarification. A glossary would have helped, alleviating the problem of clogging the main body of the text with definitions.

After the slender presentation in Chapter 3, Chapter 4, “Hypermedia Systems: Meeting the Challenge of the Web,” contains a welcome degree of detail; however, this one also has its problems. Ms. Lennon begins by quickly reviewing the historical development of the Web, then listing a number of problems with the current “first-generation” Web. She then discusses a number of ways in which the Web might be improved upon, including corrections to current problems and extensions to improve and add functionality. In general, these potential improvements sound interesting and worthy of investigation—the need for reputable electronic publishing houses, for instance—and some of them are discussed later in the book.

Unfortunately, this chapter introduces another problem, one that accumulates through the remainder of the text. In her discussion of potential improvements, Ms. Lennon repeatedly makes reference to the Hyperwave software, created by Austrian researcher Hermann Mauer. In fact, from this point to the end of the book, the software and ideas of Mr. Mauer come to dominate the text, including three entire chapters dedicated to discussion of his software and hypermedia communication protocols. Mr. Mauer was the author's advisor for her doctoral work at the Hypermedia Unit of the University of Auckland, New Zealand. While it is certainly reasonable to expect that she would know and advocate his work, some of which she coauthored, the repeated mentions go beyond biased advocacy toward overt promotion.

Hyperwave, now a commercial product, has won awards and become quite successful. Still, I felt uncomfortable with the way his ideas and products are featured, often without comparison to or mention of competitors’ work.

Finally, Ms. Lennon completes Chapter 4 with a thorough discussion of Web security issues. In fact, her discussion of encryption and security protocols is much more detailed and technical than any other section of the book, to the degree that it seems out of place. She not only explains the ideas of cryptology but discusses the algorithms down to bit-level mathematics. At another point, she describes how the bits of ASCII message code are XORed, but she never defines ASCII or XOR. Obviously, nontechnical students would be quite confused by instances such as this.

Chapters 5 and 6 return to a more generalized and introductory level of presentation and are rather successful. Chapter 5 is an interesting projection of ways that hypermedia systems might further infiltrate day-to-day life in the near future. Ms. Lennon discusses a number of topics, including virtual reality, data visualization, electronic marketplaces, electronic publishing, and computer-supported learning. The discussion of each topic is brief—nearly always less than one page—but the chapter acts as a good overview, and she returns to some of these topics later.

Chapter 6, “The World Wide Web,” begins the second major section of the book, “Web Technologies.” As a jumping-off point for the subsequent discussions, this chapter acquaints readers with the essential technologies that make up the Web: Uniform Resource Locator (URL), HyperText Transfer Protocol (HTTP), HyperText Markup Language (HTML), Common Gateway Interface, Java, browsers, search engines, and Web crawlers. The presentation is good enough as a conceptual introduction, but I do think that the scant one-sentence entry regarding Java is a fairly serious shortcoming.

Next, Chapter 7, “Hyperwave—An Advanced Hypermedia Document Management System,” explains the origins and specifications of Mr. Mauer’s software. Hyperwave was designed to enable orderly management and presentation of large databases of hypermedia materials. The Web will certainly need improved methods of data management if it continues to evolve toward greater multimedia content. One notable difference between Hyperwave’s protocol and the more familiar HTTP model is that links are not embedded into Hyperwave documents. Instead, each document contains pointers to addresses stored in a separate database file. This way, the updating of links does not require one to edit all files that refer to them, just the database file. Moreover, Hyperwave systems are always organized in a hierarchical fashion, which may allow for easier navigation and orientation. They are also quite flexible in being able to access and present documents created in HTML as well as Hyperwave’s own HTF format, standard graphics and sound formats, and Java applets.

Chapter 8, “Hypermedia: Standards and Models,” describes the standard networking protocols: network access services, TCP/IP, Asyn-
chronous Transfer Mode (ATM), HTML, and digital compression techniques. The explanation of compression techniques, like the earlier discussion of Web security, is clearly intended for a more technologically educated audience than the majority of the book, for no apparent reason. The text continues with brief presentations of several hypermedia models, including the Dexter Hypertext Reference Model, the Hypertext Data Model, and the HM Data Model. These are brief but well done, and the author does in this case present differing systems for comparison.

Chapters 9–16 constitute the final section of the book, “Advanced Applications and Developments.” Chapter 9 presents a good overview of the possibilities for electronic presentation, publishing, and digital libraries. Chapters 10–12 focus on using hypermedia technology for educational purposes. For educators interested in pursuing the development of hypermedia content, these three chapters provide examples of the possibilities both now and in the future, from using technology in a traditional lecture situation to online learning situations. Throughout the discussion, Ms. Lennon cites and briefly explains existing educational systems using these ideas.

Chapter 13 covers the topic of interactive movies, both for entertainment and education. The kinds of interactivity include zooming into specific portions of the image, annotations attached to elements in the image, viewer-influenced actions, and “total immersion learning environments.” Interestingly, when discussing the possibilities of zooming into portions of an image in any way they wish, the author adds that, “just as modern video cameras can localize and magnify sound, it will be possible to have the sound adjusted to correspond to the pictorial zooming.” Her description makes this sound easy, but computer musicians will know that this is definitely not a trivial problem.

Next, Chapter 14 investigates “personal assistants,” tiny computers that in the future we might carry around everywhere and which will provide a large range of services. These services might include information retrieval and automated organization, computer anticipation and automatic performance of services, visual and sound recognition functions, and more.

Finally, the last two chapters discuss MUSLI, a “MUlti Sensory Language Interface.” This essentially is a protocol for a new kind of visual communication in which instead of reading static symbols such as letters and words, one reads animated icons. MUSLI was created by Ms. Lennon and Mr. Mauer and seems to be an idealistic attempt to create an animated Internet Esperanto. While somewhat intriguing conceptually, it seems a bit much to devote more than 40 pages to this protocol in an introductory text on hypermedia. It does, however, serve to conclude the book in a way that makes the reader feel on the edge of new ideas that might eventually transform society (or quickly be left behind by the tides of history). This feeling of anticipation and unknowing is often what makes new technology fascinating to use and study.

Overall then, Hypermedia Systems and Applications seems a bit uneven. At its best, it provides coherent, condensed introductions to most of the currently relevant facets of hypermedia technology. It is written in a clear style and is organized in a manner that is easy to navigate. By mixing many brief explanations of history, current protocols, and possible future directions, this book could function as a fine point of departure for further lectures or class discussions. However, the technical skill level to which it is written is not consistent, and technical terminology is sometimes used without being defined. Moreover, as the book progresses, her bias toward and promotion of a few specific people and products comes through more strongly than I feel is appropriate.

I would like to suggest a couple of small additions that would help improve the reader’s experience of the text significantly. One would be to include a glossary at the end of the main text. The second would be to better format its list of referenced URLs. As it is now, the URL found in the body of the text consists of a two-character alphanumeric code corresponding to a complete URL listed at the end of the book. This list, however, does not identify what exactly the address refers to. It would be much better if the appended list included a title for each URL in addition to the code number, to alleviate this problem.

**Martin Supper: Elektroakustische Musik und Computermusik: Geschichte, Ästhetik, Methoden, Systeme**

Softcover, 1997; ISBN 3-923-99777-9; 208 pages; illustrated, notes, bibliography, subject index, name index; Wolke Verlag, Hofheim, Germany

*Reviewed by Anna Sofie Christiansen
New York, New York, USA*

As suggested by its title, *Electroacoustic and Computer Music: History, Aesthetics, Methods, and Systems*, Martin Supper’s book takes...
as its point of departure a historical survey of electroacoustic and computer music garnished with information on methods and systems that have been used in sound synthesis and computer music composition. Unfortunately, this orientation seems to have overshadowed his discussion of aesthetic issues, leaving us with yet another book on electronic and computer music, that—despite an enticing title—does not leave space for discussion of the aesthetic implications of the medium.

The book reads almost like an encyclopedia entry on electronic and computer music. The introduction presents a classification of electroacoustic music into live electronics, tape music, musique concrète, and electronic music. These categories can be exemplified by Edgard Varèse’s Déserts, John Cage’s Williams Mix, Pierre Schaeffer’s Cinq études des bruits, and Karlheinz Stockhausen’s Studien I and Studien II. Despite its obvious pedagogical virtues and historical value, Mr. Supper’s classification has two problems. The first of these arises from examples given in each category that are ambiguous or erroneous.

The mention of the Studio di fonologia in Milan as being founded on the approach taken by the Cologne studio requires further explanation to convince me. The author correctly mentions that the Cologne aesthetic was oriented toward the synthesis of new electronic sounds. However, the placement of Luciano Berio’s pieces Tema: Omaggio a Joyce (1958) and Visage (1960–61) in this category seems problematic. In Visage, the vocal sounds are split into phonemes or nonspeech sounds such as snorts and moans, which led to a ban of the piece before it was even broadcast on Italian radio (Nicola Scaldaferrò has humorously characterized these sounds as “pornophony”). Both compositions consist of editing and otherwise manipulating recordings of the human voice into a montage. The pieces more properly belong in the category of musique concrète or tape music, or should perhaps constitute a category of their own.

Despite Mr. Berio’s inevitable knowledge of Gesang der Jänglinge (1956), in which vocal sounds are interspersed with synthetic sounds, he consciously chose to use vocal sounds exclusively to explore their expressive capabilities. One could argue, as does Mr. Supper (p. 25), that the Milan studio was inspired by the work taking place in Cologne. It is true that they shared an interest in exploring the tape medium as a way to explore the boundaries of human communication. In Cologne, however, this was exemplified by interest in the work of Werner Meyer-Eppler, in Milan, by the collaboration between Umberto Eco (and other Italian writers) and Mr. Berio. Hence, the approaches were quite different.

Another unfortunate imprecision is found in the listing of Mr. Cage’s Williams Mix (1952) and Fontana Mix (1956) both as live-electronic pieces, i.e., pieces that have an obligatory live control of the mixing board during performance (Supper, p. 15) and tape music pieces as well (p. 17). According to James Pritchett (who presents sketch material in his book, The Music of John Cage), Williams Mix does not call for any live intervention in performance. Neither does the 1956 version of Fontana Mix (the one explicitly mentioned by Mr. Supper), or subsequent versions. This piece is simply an open score that serves as instructions for how to record a tape piece, without indicating anything about the actual execution of the piece during performance. Live mixing is, on the other hand, crucial in the series of Imaginary Landscape pieces (which are correctly classified as live-electronic pieces).

Rather than merely presenting this contradictory information, the above-mentioned ambiguities could have spurred an important discussion of an oft-ignored issue in writings about electronic music: performance. Despite the aesthetic intentions of most of the early electronic composers to eliminate the performer, most of the early pieces were performed in places that could not provide proper equipment, thereby submitting the music to the uncertain destiny of live mixing. Furthermore, many of these pieces were intended for four tracks, a fact that often required live mixing because of the high technical demands on quadraphonic systems. Hence, the constraints on performance often required compromises with respect to equipment as well as the inevitable variations due to concert presentation. Performance, therefore, is an important issue.

The second problem in Mr. Supper’s classification arises from the overlapping functions of the computer. He correctly mentions that the computer to a large extent has been employed to facilitate and extend sound synthesis, whereas he claims that the term “computer music” adds to the previous categories through its ability to formalize composition [i.e., algorithmic composition]. It seems as though the author has forgotten that, among others, both Olivier Messiaen (Mode des valeurs et d’intensités) and Mr. Stockhausen (Studien I and II) had already attempted to formalize the compositional process without the aid of the computer. The computer thus contributes but a facilitation of this process rather than the creation of a separate new category.
This categorization therefore seems to founder on a confusion between technique and the nature of the medium itself. The computer offered a vast increase in the ability to explore ideas that had already been developed. Hence, rather than constituting an epistemological shift in compositional approach, the computer could better be characterized as a tool that challenges the above-mentioned classification solely through its capacity to handle an immense and complex set of data, whether control parameters or generative algorithms. One could argue that the computer constitutes a new category through its ability to interact with a live performer, but the author does not make this connection.

In the main part of the book, Mr. Supper focuses on the historical emergence of sound synthesis and then carries on to algorithmic composition. He ends with brief introductions to, among other things, interactive composition and linguistics. His exemplification of the different stages in sound synthesis is thorough and makes the book a good source of information on this subject. These encyclopedic qualities are reinforced by the inclusion of an impressive and comprehensive bibliography organized by topic, and a detailed index. Unfortunately, the interpretation of the facts listed often seems scattered and arbitrary because of the failure to relate them to a larger context.

In the section on sound synthesis, I find the point of departure in the perception of sound crucial for writing about this topic. The author’s point that in electronic music the listener does not discover sound but constructs it is important, but as I will show later on, problematic. This point helps us to understand why the development of electronic music was such an important event: suddenly music could be disembodied from the performer and hence from the aesthetic reins of the concert hall repertoire. It seems, however, that Mr. Supper’s description gravitates toward models of sound rather than how those models were employed by composers. He describes Dennis Gabor’s idea of sonic quantum and Albert Einstein’s “phonon,” as well as Norbert Wiener’s cybernetic theories. Unfortunately, these explanations are not linked to case composition studies, even though it is commonly known, for example, that Mr. Wiener’s ideas had a strong influence on two pioneers in American electronic music, Louis and Bebe Barron [e.g. For an Electronic Nervous System No. 1].

The presentation of sound synthesis could benefit from a contextualization of the techniques described. A brief discussion of why vertical synthesis [Mr. Supper’s expression for additive and subtractive synthesis] appears to have become the prime directive for many early experiments, for example, would have been welcome. This trend occurred not only because of the technologies available, but also because it provided a conceptual framework presumably derived from composers’ knowledge of Helmholtz’s theories, which linked directly into the paradigm of constructivist thought. On the other hand, FM [frequency modulation] synthesis, the third technique placed under the rubric of vertical synthesis, was a means to enrich the otherwise terse sounds generated by the other two techniques. The author points this out, but again, it would have been appropriate to point to the shortcomings of FM synthesis rather than merely list facts about the Yamaha patent. [The sounds generated by this process often resembled each other so much that, thanks to repeated exposure to them in Yamaha’s products, they became identified as stereotypical “synthetic” sounds.]

A concluding section on aesthetic consequences does not go much beyond the previous sections. Mr. Supper lists compositions as examples of different sound-generating techniques, but again, any discussion of the pieces as music is unfortunately omitted. The last part of the book is concerned with algorithmic composition and generative processes. Here again, the author displays an impressive knowledge of the historical facts that he sees as predecessors for the automation of musical composition. We find explanations of voltage-controlled oscillators (VCOs) and analog sequencers as well as hybrid systems offering both sound synthesis and control; from there the discussion moves to punch-card-controlled synthesizers and, finally, the development of MIDI.

The subsequent discussion of algorithmic composition has similar strengths but suffers from some of the same drawbacks as the previous sections. Here again we find a listing of techniques presented historically but without any critical commentary. One might want to ask a basic question such as why, for example, the incorporation of random elements became such a prominent paradigm for music composition. In the case of Lejaren Hiller, random processes were used to generate a prolific compositional material that was then submitted to the rules of species counterpoint and other compositional processes. In his subsequent mention of Iannis Xenakis’s stochastic music, the author neglects to point out obvious differences between the two composers’ works. In the latter’s pieces, randomness [here in the guise of probability functions] became a means to transcend the rigid ma-
Charles Madden: Fractals in Music: Introductory Mathematics for Musical Analysis

Hardcover, 1999, ISBN 0-9671727-5-6; 210 pages; illustrated, bibliography, index; High Art Press, P.O. Box 58661, Salt Lake City, Utah 84158-0661, USA

Reviewed by Bruce Quaglia
Salt Lake City, Utah, USA

Charles Madden’s recent book, Fractals in Music: Introductory Mathematics for Musical Analysis, purports to “establish a new genre of musical analysis” that is “expected to be on the shelves of dedicated music theorists for decades to come.” This is what the author states on his back cover, at least. There is no doubt that traditional music theory and its techniques of analysis have long been under fire from both within musical academia as well as from the outside, but is Mr. Madden’s book an auger of what the music theory of the future might be like? I doubt it. Instead, I believe this book offers an interesting but ultimately idiosyncratic view of music history and theory that is often overly generalized and severely underdeveloped. In all fairness, the author has clearly intended this as a speculative introductory text, and so it is natural that many of his ideas would require further development. It remains to be seen, however, whether he is truly “on to something” with respect to many of his historical interpretations and especially with respect to his attempted applications of advanced mathematics to musical analysis.

The scope of the book is ambitious. It covers topics as diverse as historical tuning systems, multiphonics, acoustics, theorists such as Rameau, Schoenberg, and Schenker, historical use of the Fibonacci series, “randomicity” and noise, statistical distribution, signal processing, and transforms. The very breadth of the topics covered virtually ensures that no single topic will receive adequate treatment. Despite Mr. Madden’s stated intention to write detailed books on each of the topics introduced in this book at some point in the future, the coherence of the present text unmistakably suffers from insufficient focus. His thesis seems to be that advanced mathematics have in the past held considerable sway over theories of music and that they will do so again in the future. Although this argument has certain obvious virtues, to contrast the intellectual milieu of Pythagoras and Rameau with the present situation is to ignore the fact that, for these earlier thinkers, mathematics, science, art, and philosophy were part of an undifferentiated continuum, whereas today we live in an era of highly specialized intellectual pursuits.

Just the same, the interface of the arts and science is plainly a rich terrain in our own time. Perhaps such
historical justification is simply not necessary.

Throughout the early chapters of this book, the author presents us with the rudiments of chaos theory and fractal geometry amid an ongoing narrative comprised of musical analogues to the concepts presented. Unfortunately, many terms are introduced with little or no explanation during the discussion, and the reader is quickly distracted by "Julia sets," "the L-system," "Cauchy sequences," and the like. The book apparently assumes no prior knowledge of these topics but does not offer the restrained use of jargon or the more detailed explanations we would expect of an introductory text. Definitions or discussions in the form of footnotes or an appendix would certainly ease the difficulties for the uninstructed.

One of the most pervasive concepts discussed in the early part of the book is the topic of the "attractor" and its many and varied musical corollaries. Mr. Madden's discussion of this concept as it is drawn from chaos theory is clear and simple enough, and certainly his analogies to concepts within music and music theory are plain enough as rudimentary metaphors, but they appear to be little more than that. To reduce Schenkerian theory to a "dynamic" theory that is about motion toward an "attractor" is such a gross oversimplification that it jeopardizes the credibility of much of the surrounding discussion. Indeed, when we take the highly complex theories of figures like Schenker and Schoenberg and then throw in the polemics of Stravinsky for good measure and treat them in the most generalized and metaphorical manner possible so that they all come out roughly the same, we do music theory a grave injustice. We do not really need mathematics to do that, and I suspect we can put musical mathematics to better use. Along these lines, I found myself wondering why there is no detailed discussion of theorists such as Allen Forte, Milton Babbitt, David Lewin, Robert Morris, Henry Klumpenhower, and their contemporaries. Surely these are theorists who have used mathematics in pursuit of music theory and analysis? This brings me to my biggest complaint about the book: the author seems intent on including in his agenda the reform of music theory and how it is taught. Judging, however, from the examples he cites that are simply misconstruals and the glaring omissions that ought to have been cited in some detail, the authority of his views on music theory has to be somewhat called into question. The idea of self-similarity in music is not new: it has been discussed in some depth using fairly sophisticated mathematical apparatuses by many authors whose work Mr. Madden appears not to be familiar with. The list of theorists I have mentioned above is merely the basis of a much larger bibliography that any author on this topic really ought to be intimate with.

The later sections of this book present a variety of analyses. Some of these seem relevant and to the point, while others exhibit that worst of analytical sins: simply using the wrong tool for the job. These chapters focus on analytical techniques that rely upon distribution analyses, statistical and otherwise. While the use of such techniques seems not only appropriate but even illuminating when applied to music by such composers as Iannis Xenakis, their application to Schubert and Gregorian chant do not seem to yield results that tell us anything we don't already know about this music. Their inclusion seems to weaken the case for developing such tools. If we merely intend to apply such techniques to music for which we already have better analytical tools, we might as well not bother. Plainly the more compelling use for such tools is their application to repertoires for which we still lack precision in our analytical descriptions. The author does present some such analyses, of Charles Dodge, Ian Stewart, and Mr. Xenakis, for example. These are paltry, though, at most a vague paragraph or two each.

I am also surprised that a book devoted to mathematics in music and particularly to fractals would omit mention (much less detailed analysis) of composers such as György Ligeti and Charles Wuorinen, composers who by their own admission have been working with fractals for decades as part of their compositional procedures. Other lesser-known composers could also have been included. Having reviewed entire CDs of such composers in the past, I feel certain that there is no shortage of them. Why not apply fractal-based analysis where there is evidence of fractal-based composition?

The book concludes with a brief discussion of signal processing and transforms. It is difficult for me to imagine a reason for revisiting these topics in an introductory manner when definitive treatments of this material have already been available for years in standard computer music texts (Charles Dodge, F. Richard Moore, etc.). The use of these tools for analytical purposes would have been far more interesting. A timbral analysis of Mr. Ligeti's Artikulation based on Fourier transforms, for example, would be compelling. What is presented is not new and is not applied in a new way.

In conclusion, I think this book promises far more than it can de-
liver and will be disappointing to anyone with a detailed knowledge of music theory. It may be of interest to readers with a dilettante’s interest in both music and mathematics, but I am afraid it would also be grossly misleading to such a reader. If Mr. Madden does indeed write more advanced books in this area, I hope that his focus will turn to specific means of applying analytical mathematics to particular pieces of music that require such tools. Such analyses would need to be far more substantial and detailed than what appears in *Fractals in Music* to make a convincing case for reforming the current toolbox that most music theorists bring with them to work each day.

**Recordings**

**Jorge Antunes: Musica Eletronica 70’s I; Musica Eletronica 70’s II; Musica Eletronica 90’s I**

Compact discs CD ST 001 (1994), CD ST 002 (n.d.), CD ST 004 (1998); available from Sistrum Edições Musicais Ltda., Caixa Postal 04580, 70919-970 Brasilia—DF, Brazil; fax (+55-061) 368-1797

Reviewed by Osvaldo Budón
Montreal, Quebec, Canada

Born in 1942 in Rio de Janeiro, Jorge Antunes is, with Reginaldo de Carvalho (Guarabira, 1932), Gilberto Mendes (Santos, 1922), and Willy Corra de Oliveira (Recife, 1938), one of the earliest practitioners of electroacoustic music in Brazil. His first experiences go back to 1962, when he had built several generators, filters, modulators, and other electronic equipment. Mr. Antunes is presently director of the Electroacoustic Music Studio of the University of Brasilia, and president of the Brazilian Society for Electroacoustic Music. These three mini-CDs present an opportunity to listen to a selection of his compositional output, including both early and recent works.

**Musica Eletronica 70’s I**

This disc includes two compositions realized at the Electroacoustic Studio of the Centro Latino Americano de Altos Estudios Musicales (CLAEM) of the Torcuato Di Tella Institute in Buenos Aires, Argentina. If nothing else, the commercial release of these pieces is important as it documents part of the musical output of this institution, which existed between 1961 and 1971 and had important repercussions on the new music life of Argentina and Latin America. CLAEM offered biannual scholarships to young Latin American composers who thus had the opportunity to study with some of the most important musical figures of the day, including Luigi Dallapiccola, Gerardo Gandini, Alberto Ginastera, Bruno Maderna, Riccardo Malipiero, Oliver Messiaen, Luigi Nono, and Iannis Xenakis.

**Cinta Cita** (1969) is a 5-min composition that is the first that Mr. Antunes—a student at the time—realized in a professional studio. The purely electronic sound material includes filtered noise and synthetic sounds created by additive synthesis. The piece presents the interaction between sustained, continuous textures and groups of short sound events which create irregular rhythmic configurations. It works quite well, displaying formal clarity and an effective economy of material.

**Auto-Retrato Sobre Paisaje** (1970) incorporates an objet trouvé in the form of an Argentinian tango taken from an old recording. Fragments of this material are looped and provide a basic pattern over which the composer builds the characteristic rhythms of Brazilian samba. Halfway through the piece, the spoken voice of the composer makes its apparition, gradually coming to the foreground. Made up of mostly meaningless vocals, the speech does include certain understandable words which are intended to convey the composer’s concern with the political situation of Latin America. This is a longer piece (ca. 15 min) and is as formally successful as *Cinta Cita*. It is more interesting, in a sense, as it presents a conscious search for a musical identity that reflects Latin America.

**Musica Eletronica 70’s II**

This disc features a single 20-min piece composed at the Institute of Sonology at Utrecht, Holland. Dedicated to the composer’s first son, *Pata Nascer Aqui* (1971) is organized in three sections roughly outlining an ABA form. Long, slowly evolving, complex sounds characterize the A sections, while configurations of mostly short, punctual sounds characterize the contrasting middle section. I very much enjoy the exploration of a limited yet rich sound world and
the way that these materials match the time span over which they evolve. I do not, however, find a correspondence between the formal structure and the composer’s declared intention that “the music tries to evoke all the dramatic aspects of pregnancy and of delivery.” The crying of the composer’s infant son and a repeated major chord (elements expected to express “conclusive manifestations of Life and Hope”) that are brought in at the end of the piece appear to me as foreign material, unrelated to the composition’s internal logic.

Musica Eletronica 90’s I
This CD contains a single composition produced at the Groupe de Recherches Musicales [GRM] in Paris. Here we find Mr. Antunes approaching electroacoustic music as a means of witnessing the social reality of his time. Ballade Dure (1995) centers on a recording of the voice of an unemployed man begging for money in the Paris metro. As a counterpart to the man’s voice, the sounds of the metro—particularly the closing of doors—and static textures made of electronic sounds are used. It is clear that these sound materials, even the strictly electronic ones, are used for their evocative qualities rather than for purely musical reasons.

I find the [few] digital transformations of the man’s voice to be unimaginative. Also, in spite of the modern equipment used to generate them, the electronic sounds appear dated, as if belonging to a different decade. In addition, some of the recorded materials [e.g., running steps] sound like low-budget, radio-theater sound effects. Moreover, the formal organization of the piece seems rather loose and its temporal scope (20 min) excessive. All this is surprising coming from such an experienced composer. Perhaps he was not quite at ease with the technological environment he was working in, or perhaps he trusts the message contained in the material itself (the recording of the beggar) to be strong enough to override all the above-mentioned deficiencies. In any case, I was disappointed.

Judging from the program notes, Mr. Antunes does indeed have high expectations about the extramusical communicative power of his composition: “The final part of the work takes us to a new and surprising situation. Antunes uses an expressive silence of about ten seconds which will provoke, in the attentive listener, a great and powerful moment for profound reflection on our society and our internal and external worlds.” The result does not measure up to the expectations.

I find these recordings to be uneven in their artistic quality. I would rate Musica Eletronica 70’s I as the most interesting, followed by Musica Eletronica 70’s II, and last, by far, Musica Eletronica 90’s I.

Mary Lee Roberts: Six Compositions

Compact disc Open Space 9, 1997; available from Open Space, R.D. 2, Box 45E, Red Hook, New York 12571, USA; fax (914) 758-6740; electronic mail postmaster@the-open-space.org; World Wide Web www.the-open-space.org

Reviewed by Patricia Dirks
Kitchener, Ontario, Canada

Mary Lee Roberts (b. 1964) is an American composer who has been teaching music technology at Moorhead State University in Minnesota since 1995. She has an impressive talent for creating fascinating sounds. Five of the six compositions on this disc are computer generated, and all of them were produced and mastered by the composer using Sonic Solutions at New York University in 1997.

The first composition is Eusebio Consumed, an electroacoustic work in three movements: Eusebio Rec oniles His Passions, Dialoguing with the Ventana Sea Nymphs, and Re-birthing. Back to the Womb. The entire composition is based on Robert Schumann’s imaginary figure Eusebio, from his Carnaval. Eusebio is the personification of Schumann’s own nature as an introvert and youthful dreamer. In this work, Ms. Roberts takes the listener one step further into the possible depths of Schumann’s creation. Through an ambient and colorful soundscape, Ms. Roberts depicts a musical story from her own very worst imaginings of what it would be like to observe the psychoanalysis of Schumann’s Eusebio by Sigmund Freud. What results from this exploration is a daydream-like atmosphere achieved by subtle sonic changes from one similar timbre to another, producing a wash of sounds that seem to ebb and flow with the tides. At times, pro-
cessed murmurings and dove-like coos evoke images of alluring sea nymphs singing to entice Eusebio. *Eusebio Consumed* is wonderful music with its delicate treatment of sprightly sounds and the absence of an audible pulse, enabling the listener to experience a calming soundscape suitable for one’s own daydreams.

*Things Fall Apart* is a sonic journey from the recognizable to the incomprehensible and all points in between. This electroacoustic composition is based on a computerized voice of which various transformations form the sonic landscape. Ms. Roberts describes this work as a deconstruction of sonic elements such that the comeback of musical elements occurs. The voice is used at times for its percussive nature, emphasizing consonant-like sounds, and at other times for its sustaining qualities, thus emphasizing vowel sounds. The music plays upon the listener’s comprehension, with one audible moment briefly emerging before being pulled back into the deconstructive sound world already present. This ability to play upon the listener’s desire for understanding arouses anticipation throughout this intriguing composition.

*Madeleines* is a five-movement computer-generated composition representing an attempt to trigger past memories. The title of the work is a reference to the small delicacies mentioned in Marcel Proust’s *Remembrance of Things Past*. In the book, the tasting of the madeleine triggers recollections in the same way certain smells can bring back lost memories. In this composition, each of the short movements—1, 3, and 5—are the “madeleines,” with the longer passages—movements 2 and 4—being the memories or events one is trying to remember. The sonic material uses contrasting elements of sustaining string-like sounds against fragmented vocal material to achieve this. Overall, this work again draws on Ms. Roberts’s success in engaging the listener in a mentally stimulating sonic exploration.

*Winter Cranes* represents a particular migration of cranes in an aural, electroacoustic setting. This work was inspired by a friend’s experience watching the migrating flight of a group of cranes in the California desert. The music reflects this image through sounds that seem to soar around the sonic landscape Ms. Roberts has created. This is a reflective work in the way various sounds are juxtaposed to create an ambient space.

*CROSSING on the Salmon* is the only acoustic work featured on this disc, and is a composition for vocalist and ensemble. Grace Mannion-Jacobson is the soprano and tam-tam player on this recording along with the University of California at Santa Barbara Prisms New Music Ensemble. The text was written by the composer after driving at twilight through the Salmon River country in central Idaho, where she experienced a “blissful view of a blue sunset over black mountains.” Ms. Roberts delicately dovetails the voice and instruments to create a finely woven mesh of sound, very much reflective of the sound worlds she creates in her electroacoustic compositions. The text and music mirror one another such that one can easily hear the emptiness of land and imagine the blue black skylines of the country. *Crossing on the Salmon* is an inviting composition that superbly compliments the computer-generated works surrounding it on this CD.

*White Writing* is an electroacoustic composition in two movements: *Bird*, and *Night Foxes*. This work was inspired by the technique used by artist Morris Graves to produce light through the process of applying tiny skritches of white paint in dense yet transparent coatings. According to the composer, this technique often occurs over figures of animals. *White Writing* was also inspired by the famed radio talk-show artists, “Pam and Joanne,” of WWWE Cleveland/The Monster on the Lake. In the composer’s words, they “tried (unsuccessfully) to [en]lighten the air waves.” This piece features sonic material similar to that used in *Madeleines* (both were composed in 1997). Vocal calls transformed through signal-processing effects dominate the first movement, while shimmering, radio-wave-like frequencies occur in the second. The entire composition features unique sounds rich in timbre and fascinating transformations.

All of Ms. Roberts’s compositions included in this collection are presented as sonic descriptions of her own thoughts, ponderings, and experiences. This CD exemplifies her delicate and delightful treatment of sounds, rich in timbre and tantalizingly pleasing to the ears. *Six Compositions* is a refreshing and satisfying listening experience.

**Jon Welstead and Yehuda Yannay: The Ghost in the Machine**


Reviewed by Camille Goudeseune Urbana, Illinois, USA
This compact disc presents compositions and improvisations by one or both of Jon Welstead and Yehuda Yannay. The title refers to “how the rational functionings of the ‘Machine’ are mediated by the impulsive and unexpected choices that the creative ‘Ghost’ makes.” The six fairly long works recorded here demonstrate various aspects of this mediation.

Milton Babbitt once quipped that a recording of a Tchaikovsky symphony is a work of electronic music. The first track, a recording of a Tchaikovsky symphony is fragmented and intensified by manipulation with a sampler. (It is encouraging to hear a work using decade-old technology that does not sound dated!) The predominance of speech fragments in the musical surface lets the composer present lengthy stretches of new material with only occasional [but instantly recognizable] restatements of motifs from earlier in the piece. A Babbitt-esque synthesizer comments on the proceedings from time to time. This piece is paired with another that uses voice as its source material. Mr. Welstead's All In A Whisper samples on a much finer scale with granular synthesis. The resulting timbres are the perfect contrast to the crystalline sounds of the opening track: separate chirps flying around [but no pulse trains!], slightly gritty sustained tones and chords acting as micro-active backgrounds, or panning.

Steve Nelson-Raney, another University of Wisconsin-Madison resident, adds his saxophone to Mr. Welstead’s synthesizers in the coimprovisation entitled Waiting In Non-Compliance: If We Want It So.

This track stands out for its imagination and freshness. The saxophone avoids full-tilt wailing, preferring nervous licks or short quiet notes. The timbral variety of saxophone and synthesizer is evenly matched. A memorable texture from this work is a long lyrical saxophone line over a burbling bed of algorithmically generated MIDI messages. Prominent fourths and fifths in both melody and harmony suggest tonality without actually falling into it to get comfortably stuck. This improvisation is fantastic in the original sense of the word.

In Topochronos, Mr. Welstead turns to the combination of unprocessed singer, harp, and synthesizers. The synthesized sounds present another paradox for ears used to more traditional ensembles: this orchestral tour de force feels bigger than big because all the instruments seem very close to the listener, not spread over a concert stage. Only the tenor (Daniel Nelson, also the singer for In Madness...) sounds distant.

The final selection, In Between Us, suggests coimprovisation in its very title. Mr. Yannay and Mr. Welstead themselves collaborate here with their synthesizers and software. With more than one performer making decisions, the boundaries between sections blur. On the recording we cannot see who is responsible for what—we hear it as a single performance. As with Terry Riley’s In C, careful formal analysis may be irrelevant if it is even possible. One thing happens, then another, then another—slowly or quickly. The music could go on for 40 minutes instead of 20. The truism that talking about music is like dancing about architecture fits this last work well.

The booklet accompanying the CD has over a dozen pages of solid text which serve as a good presenta-
tion of the challenges computers give to musicians and to conventional labels of form or style. This discussion is well illustrated by the variety of sounds and structures found in the music. The Ghost in the Machine could be just the thing to introduce your uncle or mother-in-law to the mysterious work you spend so much time doing.

Ned Bouhalassa: Aérosol

Compact disc empreintes DIGITALes IMED 9840, 1998; available from DIFFUSION i MéDIA, 4850 avenue de Lorimier, Montreal, Quebec H2H 2B5, Canada; telephone [514] 526-4096; fax [514] 526-4487; electronic mail info@electrocd.com; World Wide Web www.electrocd.com

Reviewed by Anna Rubin Oberheim, Ohio, USA

The composer Ned Bouhalassa has been an active and influential practitioner of electroacoustic music in Montreal for much of the 1990s. Mentored by composers such as Francis Dhômont, he has integrated the latter’s acousmatic poetry with such street influences as techno and rap. His music is characterized by a richly textured and rapidly shifting sound palette. In this collection he favors such sounds as the “jet” gesture—swooshes of white noise and/or water—which pervade the music, both as theme and point of formal articulation. Mr. Bouhalassa also uses silence to articulate his rondo-like structures in which he cycles through various gestures in ever-evolving variation strategies. Throughout, quirky rhythmic textures interject themselves, sometimes as fragments, sometimes in extended sections. He uses orchestral-like pads in the same way, sometimes evoking film-like scenes.

This release, though billed as a “compact compact disc,” in fact contains five pieces comprising over 50 min of music. The first piece, Jets (1996–1998) is a dynamic exercise in which “water, air and dust…serve as models for the creation of…sonic materials.” We are introduced here to the eruptive jet streams of white noise, heard sometimes in rapid and other times leisurely glissandi. Layers of delicate, tinkly tonal music contrast with completely atonal twitterings. Shades of Buchla FM/joystick meanderings pervade the center of the work, evolving into slowly shifting layers of jet stream. A twittering rhythmic layer of quirky vocal-like utterances spills into a gentle tolling of bells.

Constatment (autoportrait) (1997) features water/wind waves and children’s voices. The opening wave evolves into a thin stream of filtered noise and becomes a low pulse before dying. Strange creakings, footsteps, air, and then suddenly there appears an orchestral interlude from a film noir. It is night; pulsings erupt, wing-like, organ-like, with another brief orchestral comment. Bird-like twitterings cadence the section. The second part is comprised of fragments of breath, a quirky techno beat, orchestral snippets, and water sounds. The night returns; there is traffic. The techno layer is wonderfully separated in stereo space. Then, weird vocal fragments appear, all manner of distortions, gentle jets swoop across chirps, giggles, screams, whoops, and yelps. Kitchen sounds? Quicksand? Then more techno is overlaid on gentle siren glissandi. I wanna’ move! The diverse frag-

ments become completely absorbed in an extended rhythmic cadenza. Attraction (1992–1993) continues the play of fragments of water/wind gestures, vocal fragments, and abrupt shifts from one sonic lick to another. Percussive rhythmic patterns interject, sometimes gritty, sometimes like filtered mouth harps. Skateboards scrape against resistant surfaces. Delicate tonal pads float above, even reigning supreme at times. Nothing really persists in this environment, and everything returns, builds, dissolves. We are born along in a fractured but seductive rhythm of fragment.

Move 1 (1994): a manic bee swarm, oddly mechanical birdsongs, a looped water wave—this is nature subdued and packaged—rhabid twitterings and animal calls, wings. Water is heard, again, with things submerged or dunked. Music that is “…percussive imaginary echoes of the ‘natural’ world” (composer’s notes, p. 16). Metallic iterations take over, jangling, banging, doors—steps—bells like bees—steps in gravel—skateboards dance in staggered stereo counterpoint. An extended section of metallic pinging back and forth across the stereo image moves to more abstract sound fields, intensely dynamic on the micro level, beating and shimmering. There are also shifts on the larger morphological levels like wild lava flow. Bees return upon an orchestral-like chord repetition only to be abruptly muted.

The title of the last work, Bouffée délirante [Maddening exhalation], is the “sudden occurrence of a brief fit of madness in a patient suffering from a slight mental instability” (composer’s notes, p. 17). This piece includes the greatest use of abrupt cutoffs [introduced at the end of the last one]. It is the most mysterious
and fragmentary, but, initially, slower in pace and sparser in texture. The by-now-familiar Bouhalassian vocabulary of orchestral-like chord fragments, jet-like swooshes, quirky rhythmic interjections, and metallic clinks are here combined in a somewhat different, more ominous atmosphere. An extended, slow stream of wind/breath ends the piece and, quite satisfyingly, the whole CD.

**Michael Kallstrom: Stories**

Compact disc CPS-8655, 1998; available from Capstone Records, 252 DeKalb Ave., Brooklyn, New York 11205, USA

Reviewed by Michael Gogins
New York, New York, USA

The introduction to *Stories* on the back of the CD cover says: “A chamber opera for solo performer with puppets and electronic tape based on Old Testament stories from the King James Bible with original text by the composer....” That is quite an accurate description, although of course there are no puppets in the playing of the recording. Some [but not all] of the pieces seem to be aimed at a young audience.

*forbidden fruit* (8:20) begins with highly reverberated tonal electronic music, and immediately a pleasant baritone begins singing a text that is a contemporary gloss on Genesis. The accompaniment consists of chimes, plucked strings, bass, and a drum kit. It sounds like a sampling synthesizer played via MIDI. The style of arrangement is at times faintly reminiscent of Morton Subotnick or Todd Machover. The mix is muddy, though, with too many sounds overlapping in the midrange and too much reverberation. A pop/blues vamp comes in, with smarmy lyrics.

*babble* (8:28) tells the story of the Tower of Babel, using much of the original language at first. It begins to occur to me that the composer is better at arranging, and the arranger is better at singing. There is little difference in tempo, dynamics, or arrangement in comparison with the first track. But there is again a contrast of styles, from classical recitative to musical theater. The story of Babel takes a rather grotesque comic turn as it moves into contemporary language, not black humor that might suit the tale, but childish humor.

*vertically disadvantaged* (8:59) is about David and Goliath. David threatens Goliath with loss of television, among other catastrophes. Goliath obviously represents mass media and mammon, and David both art and the might of righteousness. There is a change of tempo into bouncy counterpoint as David sings, “Now that you are dead, I must cut off your head.”

*soliloquy* (10:03) starts in a slower tempo, with a sadder and more electronic-sounding arrangement using chimes, flanging sine waves, and FM percussion. The vocal and accompaniment flow melodically and harmonically. To my ears, this track is of distinctly higher quality, perhaps because it is not trying to be funny or ironic. The piece recounts King Saul’s madness from his point of view, including David’s soothing harp. The electronic instruments are used less here as a substitute for conventional large forces and more as voices in their own right. However, I found the lyrics rather bombastic at the climax, and the instrumental sounds are at times careless and clichéd.

>window* (7:06) is David singing about his peeping upon Bathsheba. This track has a regular beat that is not a backbeat. What might have been a moving, propulsive largo is undercut by the slight cheesiness of some of the electronic sounds.

*fiery furnace* (9:33) tells the story of the three men in the fiery furnace. Again, the imperial might and ambition in the Bible story are recast in terms of materialistic modern culture. Nebuchadnezzar commands: “When you hear the funky music [synth riff], fall down and worship with your face in the sand.” The finale is a humorous calypso: “They were strolling along in the fiery furnace, Shadrach, Mesach, and Abednego, singing and dancing, having a wonderful time.”

On the whole, I feel that some real melodic facility and the emotional and spiritual dynamite in the stories had trouble finding their way through flaccid clichés in the arrangements, drastically ineffective attempts at levity, and the too-easy reliance on preset patches.

Recordings
Mnemonicists: Horde

Compact disc ReR MO1, 1998 (reissue from 1984); available from ReR, 79 Beulah Rd., Thornton Heath, Surrey CR7 8JG, UK; fax (+44-181) 771-3138; electronic mail megacorp@dial.pipex.com; World Wide Web megacorp@megacorp.unet.com

Reviewed by Holly Day
Minneapolis, Minnesota, USA

“Intricately structured chaos” is the best way to describe this disc—loud, crashing waves of static fall into saxophone and percussion jams, while sixtyes-style, coffee house-esque free jazz explodes into booming thunderclaps of electronic noise punctuated by ethereal moans of both natural and electronic equipment. The “songs” from tracks 1–5 flow seamlessly into one another and seem to actually belong as a group, while the second half of the disc, tracks 6–10, come across as a second “set.” As the original recording was issued in 1984, it may be fair to assume that the music was arranged for the sides of a vinyl LP. The first set is dark, noisy, and chaotic, while the second is much more subdued. This would be a great soundtrack for the end of the world, although I think I would prefer to see the film rather than actually sitting through the real thing!

Personally, I prefer the first half of this disc. The juxtaposition of the guitar-saxophone-clarinet-cello-piano-violin-recorder ensemble with the screeching sounds of what sounds like a record played backwards at high speed and something large and metallic being beaten to death is just amazing. Played back at high volumes, this section borders on causing sensory overload. It comes close to being just a mess of noise, but it never actually falls apart. The second half of the disc relies much on silence and low registers as the first relies on cacophony and volume. Seconds pass without any noise at all coming from some of these tracks, leading one to believe that the piece is over, only to find that it isn’t—the silence is the music. Perhaps that reasoning is a little too subtle for me to pick up on a recording.

The Mnemonists were an important part of the experimental music scene in the UK and Europe in the 1970s and 1980s, a movement that included AMM, Art Bears, Faust, Henry Cow, and others. Many of the recordings of these groups have been remastered and released on the ReR Megacorp label.

John Oliver: Icicle Blue Avalanche

Compact disc earSay es-98004, 1998; available from Earsay Productions, 308-720 Sixth St., New Westminster, British Columbia V3L 3C5, Canada; telephone (604) 527-2358; fax (604) 524-9356; electronic mail earsay@earsay.com; World Wide Web earsay.com

Reviewed by Michael Gogins
New York, New York, USA

The title track of Icicle Blue Avalanche consists of Zeta MIDI guitar, heavily processed, with pounding, scratchy strings, and heavy, rock-inspired chords. There is an accompaniment of synthesizer patterns. The initial impression is of a good sequence of ideas. After a while, that impression disappears. The blues and rock riffs have been heard in too many other places, and do not sound quite at home here. About 7 min in, the music gets thicker in texture and more interesting; it is more broken up, less obvious, more out of control—better.

Copper Flying is more like studio-based electroacoustic music. It begins with gongs and clatterings, through much reverb. It becomes apparent that the guitar is still driving the sound, though heavily processed. The sounds are bigger and more spacious. The rock-based tonality is still present, but the beat and the typical riffs are not in evidence. This is a slow jam of some interest, more deeply felt. Sounds descend in swoops over a fairly majestic and not-too-obvious guitar fuzz drone, with other processing effects used as ornamentation and variety. I’m a sucker for this sort of thing; it’s what drew me to electronic music in the first place.

Off the Edge starts out like this: “scratch—scratch—whoop—whoop,” followed by pitched noises—thumps—rumbling under—with increasingly frantic stutterings of noise blocks. This section is fortunately short, so that whatever interest it possesses does not die out. It sounds like a cappuccino machine whose milk steamer has become psychotic. Some high sine-wave chirps take over, creating a whole new field of events, looping and phasing. Then
the noises sneak back in: water on the boil—rain of Ping Pong balls—drum roll of rolled newspapers—pitched percussion on the loop, I mean loose—howling of feedback. Mr. Oliver knows how to mix it up. There is a kind of pulse underlying all these sections that ties them together, an ascending or perceptually increasing tempo, a rising curve of time. There are discovered rhythms, musical discoveries in the noise. For this kind of thing to work, there not only has to be constant change before sections become boring, but also something to relate one section to another, to give movement and propulsion. That does happen here, mostly. Each loop or circuit of sound beats and phases against the other: the tapping on a keg with dozens of chopsticks, steam escaping from a madman’s ears. The ascending curve becomes a titanic mush of noise. It would sag if it continued, but it fades and guitar pads come through: ascending tones—the big old whammy bar—tapping and shimmering on the strings—sheets of noise pouring off the processed strings. Fuzzy old sine and pulse waves enter to signal a sort of cadence or finality, under the earring of the guitar. This, too, is a pretty good piece.

_Second Nature_ sounds like the breathing of a mummy, to start. Then: pads of vocal processing—a major chord, a subdominant progression—woody knocking sounds as the pads continue—processed fiddle? Certainly, there is processed guitar, then shimmery sounds—”hahhh” vocals—sliding violins. It seems close to pop music and film scores, and unfortunately these references pull my attention away from the actual field of events. There is a sampled, processed, and pitch-shifted vocal part. Then violins and cello accompany the vocal part, which hyperventilates with sharply in-drawn breaths of theatrical surprise, or orgasm. After 6:30, the vocals slow down, the underlying pad comes in as a higher pitch in a different key, then sinks down into the cellos. The noise and breath sounds fade out, and it’s over.

_Noh 1_ begins with a fuzz guitar chord, feedback chirps and whines, then phasing and flanging of the guitar chord. A rock progression appears, followed by sounds like tapping on the strings near the bridge, with a little high-pitched drum as accompaniment. This, too, could be film music—the hero prowling the darkened docks. A synthesized melody sings over the guitar pad, filled out by a counterpoint of these pulse-wave voices, like Emerson, Lake, and Palmer updated. Cymbal accents join the little hand drum/wood block. A “B” section abruptly cuts in; the bottom drops out, the synthesizer sharpens up with another theme, but the transition does not convince. The bridge is better, reflecting a calmer and more resigned mood, then we go back to the previous section. The piece is really too cheesy, but still, I like it. It’s saved from cliché by its conviction and the original embellishments, the sighing of pulses on the downbeats, the insistent percussion.

The final track, _InDia_, begins with yet another slow guitar pad. But a psychedelic and vaguely North Indian solo enters, with what sounds like a drum machine underneath. Again, I get the feeling that we’re sliding off into cliché land—a completely typical rock solo line...but I’m afraid I don’t like this one. A very high chime accents the struggle of some kind of vocal sonority to cut through the murk. The solo theme is not distinguished enough, its development static and repetitive, with too much uninspired improvisation, in spite of the fact that the timbres and arrangement are as interesting as the other tracks. The music fades out on a pulse shimmer.

Perhaps at this point I should make it clear that I actually like rock music; it is only that those influences do not jell for me here. Indeed, tracks 1, 4, and 6 make me think that for some electroacoustic musicians, facility with voice or instrument can be deadly, it allows clichés to sneak in and trample all over the possibilities of the material. I suspect that if Mr. Oliver had chosen not to touch his guitar, this recording would have been much more difficult for him to make, and much improved in quality.

James Dashow, Thomas DeLio, Wesley Fuller, and Shirish Korde: _MUSIC/TEXT_

Compact disc CPS-8669, 1999, available from Capstone Records, 252 DeKalb Ave., Brooklyn, New York 11205, USA

 Reviewed by Thomas Licata
_The Hague, The Netherlands_

_MUSIC/TEXT_, a recent release by Capstone Records, offers a unique
assortment of pieces that, as a group, reflect a variety of approaches to the genre of the song cycle and, more importantly, to questions of text setting in general. This recording juxtaposes four works by four very different composers, with each composer employing distinctively different tools in realizing their respective sound worlds. Furthermore, each piece sets to music the poetry of four markedly different poets, each widely regarded as an important figure of contemporary literature.

The first work on the CD, Wesley Fuller's *A Solace of Ripe Plums* (1998, for baritone and piano), is an intimate and subtle reflection of five selected poems by the great American modernist, William Carlos Williams. Throughout the cycle, the music is stripped bare of all superfluity. In each song we hear a series of predominantly delicate, sparse textures that reflect through the subtlest understatement the multiple layers of meaning and word play presented in each poem. In these songs, Mr. Williams's language and Mr. Fuller's vocal line seem to grow quite naturally out of one another, often fusing in remarkable, though always quite subtle, ways. The performers, Joe Dan Harper (baritone) and Jacques Linder (piano), offer a refined and thoroughly sensitive reading.

Shirish Korde's *Drowned Woman of the Sky* (1996, for soprano, chamber ensemble, and tape) consists of some colorful settings of English translations of poems by the esteemed Chilean poet, Pablo Neruda. In Mr. Korde's cycle, a soprano is accompanied by an intriguing ensemble of three cellos and percussion. In the fourth and last song, the ensemble is joined by a tape that has the poet himself reading the text in the original Spanish while the soprano renders her sung version in English. The poet's reading is heavily modulated with tape delay and reverberation that at times—intentionally, I assume—becomes nearly unintelligible. Matching the essentially Romantic nature of Neruda's poetry, Mr. Korde has composed a series of dramatic, straightforward settings that highlight the narrative side of each text. The score is excellently performed by The New England Conservatory Contemporary Ensemble (conducted by John Heiss), with a particularly stirring performance by the soprano Elisabeth Keusch.

James Dashow's *Second Voyage* (1977–1979, for tenor and tape) is the oldest work of the collection. The text of this work is the poem *Voyage in the Blue* by contemporary American poet, John Ashbery. The composer has spent many years composing a rich and varied array of sound structures with the aid of his diad/triad generative techniques, of which this piece is an early example. Mr. Dashow explains:

> Second Voyage reflects my ongoing interest in harmonizing specific pitches with the results of their own modulation spectra. The notes in the voice part, grouped together in two’s and three’s, were generated as frequency components of complex spectra from frequency modulation, ring modulation, and other digital signal processing algorithms. Each generating dyad or triad thus yielded a variety of “chord-spectra” [made up largely of non-harmonic partials] from which I chose material to harmonize the vocal line.

This “harmonization” produces various families of contrasting timbres and textures. As such, they create a richly diverse sonic landscape through which the voice weaves its path. Mr. Dashow has chosen to interpret the opaque nature of the text in a rather dramatic way and, in so doing, creates an exciting and striking dialogue between words and music. The performer, former Metropolitan opera star George Shirley, gives a vocally acrobatic and dramatic rendition. His voice beautifully articulates the work’s subtle phrasing, often modulating vocal colors to blend with the tape. It is an altogether impressive performance.

The last piece on the CD, *decker* (1998, for tape alone), is by Thomas DeLio. *decker* is based on a text of the same name by the American experimental poet P. Inman (a highly regarded member of the so-called L=A=N=G=U=A=G=E group), whose own reading of the poem provides the sound material for the piece. Regarding the work’s form, Mr. DeLio writes:

> “This work starts with the text and moves in two directions. At times, the music surrounds the sounds of the text with other, non-vocal sounds. At other times, however, the words themselves are broken up, stretched, and dissolved electronically to such an extent that their purely sonic attributes are enhanced, while their function as elements of language is lost.”

He goes on to add: “It seems to me that in this poetry we become aware of language in two very different ways. At times words and phrases seem to move from opaque to transparent... At other times Inman’s words and phrases seem to move in the opposite direction.

The articulation of these subtle linguistic transformations is quite unique.” As with all of Mr. DeLio’s work, this extraordinary piece represents a totally new and original approach to issues of form and musical expression. The concern in
this case is with issues relating to the setting of a literary text to music. From his electronic transformations of the poet’s reading, the composer fashions an entirely new structure which, while reflecting the poem’s design, also extends and enriches it in many ways. In decker, truly astonishing, cutting-edge po- etry is matched by music of equally new and exciting sonic dimensions.

This compilation affords an illuminating look into a variety of appro-aches to text setting. Each of the four composers has chosen very different kinds of poetry as the catalyst for their equally diverse musical settings.

Gary Berger, Michael Horowitz, Simon Jaunin, Martin Neukom, Kit Powell, Nicolas Sordet, Bruno Spoerri, and Harold Vasquez: Swiss Center for Computer Music

Compact disc stv/asm 004, 1999; available from Schweiz. Tonkünstlerverein, Association Suisse des Musiciens, C.P. 177, CH-1000 Lausanne 13, Switzerland; World Wide Web www.computermusic.ch

Reviewed by Patricia Dirks
Kitchener, Ontario, Canada

The Swiss Center for Computer Music Foundation (SCCM) aims to pro- vide professional training, research, production, and diffusion of computer music. Between its creation in 1985–1998, 120 compositions were produced by forty composers in the two studios of SCCM. From this vast collection of works, a compila- tion disc has been issued featuring ten pieces by eight of the composers. Of these, four—Gary Berger, Martin Neukom, Kit Powell, and Bruno Spoerri—are also members of the SCCM Composers’ College. This was set up in 1995 to involve composers with the everyday opera- tions of the center.

The opening track is Etude aux usines à fer (Hommage à Pierre Schaeffer) (1996), one of two works on the disc by Swiss saxophonist, composer, and arranger, Bruno Spoerri. This piece, a tribute to pioneer Pierre Schaeffer, clearly follows the tradition of musique concrète in the way the sound materials are pre- sented. Over a period of approxi- mately 7 min quiet sounds emerge and eventually overlap to create new sonic events. The listener’s interest is sparked as each sound is presented one beside another at low dynamic levels. The sounds Mr. Spoerri uses are engaging, and clear transformations are constantly occurring as the work develops. The sounds initially presented are gradually combined to produce a rhythmic sound complex of factory-like machinery. The underlying pulse that emerges is by no means offensi- ve as it occurs over a sustaining wash of sounds that tend to linger in a drone-like fashion. Over all, Etude aux usines à fer is a very ef- fective composition with satisfying, subtle changes of texture.

De-/In-/Formation (1995), for voice and electronic instrument, is Mr. Spoerri’s second contribution. On this recording, Brigitte Schär is the vocal improviser, with the composer himself on the synthophone, a wind controller blown and fingered like a saxophone with extensions for MIDI performance. This 9.5-min composition creates a sound world of acoustic-based instruments such as electric guitar, piano, flute, per- cussion, and string ensemble, all triggered via the synthophone. The vocal element is introduced over this soundscape with short mimicking bursts as well as sustained, lyrical lines. Prerecorded materials include: singing, whispering, loud murmuring, car horns, screeching halts, adult males, conversations, and children’s voices. All of this is used, at times, to create a dense sound world of many layers. This is a thought-provoking and well-struc- tured composition.

Studie 8.3 (1994) is by Swiss composer Martin Neukom. The sound material for this composition consists of two common elements in na- ture: water and various animal cries. Each sound source undergoes nu- merous transformations of process- ing and mixing, which ultimately modify their original properties of timbre and rhythm. Small rhythmic patterns emerge and disappear throughout the 11-min work, while the spatial effects tantalize the ears. When original sound material ap- pears in this sonic environment, it emerges as a refreshing contrast to the processed sound. These delicate entries create polyrhythmic textures that are rich and appealing. Through isolation and recombination, Mr. Neukom takes the listener on a fas- cinating sound exploration.

The fourth composition, entitled im selben raum (1997), is by German composer Gary Berger [b. 1967], who
considers himself an electronic artist specializing in sonic art. This computer-generated tape work presents a world of highly refined electronic sounds. Silence is an important element in this 5-min composition, used to highlight each unique sound as well as to set up tension and suspense throughout the composition. Spatiality is effectively used to create a clear and crisp sense of depth perception. As a result of constantly changing angles and illuminations, new sections of the “room” and its objects come to the fore. For the listener, therefore, nothing remains equal.

The SCCM has welcomed composers from all over the world. Included on this compilation is a work by Colombian composer Harold Vasquez (b. 1964). PRIMITIVA (1996–1997) is a work of subtle changes. Mr. Vasquez’s concept for this 7-min composition was that of cross-breeding. It was his intention to recover, salvage, and recycle sounds, and then to reconstruct the material into a composition. A mysterious chant is the basis for the hybridization in PRIMITIVA, occurring throughout almost the entire piece. Each time it returns, the chant takes on a different role according to the hierarchy of the layer in which it is present. The transformational process can be heard throughout the piece, set off by silences.

Blessed Chaos (1995) is a composition by American composer Michael Horowitz (b. 1947). The piece developed from transcriptions of improvisations on various instruments and voice. Do the materials have anything in common with each other or have they just been constrained to coexist? This is a thought-provoking question the composer poses. These improvisations were later made into tape loops and mixed together. The result is a pulsating 6-min composition that takes the listener on a journey through various soundscapes. Patterns are constantly overlapping and changing over a constant pulse. Clear rhythmic activity is always present against the faint murmuring of voices in a multitude of ordered chaos. The result makes for stimulating listening.

Pièce pour D.C. (1997) is by Swiss composer Simon Jaunin (b. 1971), the youngest composer to be featured on this CD. Mr. Jaunin composed this piece as an articulated dialogue between someone experiencing logorrhea and a sound world more or less composed. By definition, “logorrhea” is when excessive and often incoherent talkativeness or wordiness takes place. This is clearly the role of the female speaking voice in this 6.5-min composition. The sound world in which the voice is immersed consists of swirling electronic sounds, shimmering and changing pointillistic textures. New sounds are continuously being introduced, producing a layering effect, while the voice seems to be independent of the musical space. Each sound layer contains clear and distinct rhythmic loops that result in ever-changing polyrhythms. Near the end, sounds from nature emerge as well, including birds, ducks, and various insects. This provides a pleasant contrast to the electronic sounds.

This disc also features two short works, Graphe Uni (1997) and Lais Contrefait (1998), by Swiss composer Nicolas Sordet (b. 1958). Currently, Mr. Sordet is working on developing interactive computer programs for the generation and processing of sound. Both works explore the use of processed sound, particularly Graphe Uni, where the processing is used over and over again until they become sounds on their own. The use of stereo play is effective, and chaotic eruptions and continuous tensions and releases create the unique soundscapes of rich colors that permeate this composition. In Lais Contrefait (1998), Mr. Sordet uses a common sound source to refine and blend—the voice. The composition uses many variations of vocal sounds, such as murmuring and chanting, in addition to a range of processing effects. The composer’s intent is that the mixing and transformation of the muttering voices will result in a sound that the listener can no longer recognize as a voice.

The last, but definitely not least, work on the CD is WHALE, Nr. 80a (1993), for trombone and computer-generated tape, by Swiss composer Kit Powell. Originally from New Zealand, Mr. Powell emigrated to Switzerland in 1984. In this recording, his son, Philip, plays the trombone part. The music was inspired both by whale songs and an important Maori legend. According to this story, the chief of the Maoris [a Polynesian people native to New Zealand] arrived riding on a whale. This composition pays tribute to the nobility of the whale by evoking the desire for humanity to the learn their complex language to communicate with them. The computer-generated tape component includes typical elements such as changes in timbre, glissandi, and cries. With these electroacoustic sounds, presented along with the trombone and vocal extensions, this composition explores various aspects of dialogue while fragments of true whale songs define the limits of the piece.

This new compilation from SCCM is well selected. Each composition stands out on its own, yet there is a quality that connects them, enabling them to complement each other. The contrasts and similarities between the compositions produce a refreshing collection, something for everyone’s musical palette.