

MUSIC

THE ARTS

By Matthew Kiell

At age fifteen, Easley Blackwood, Jr., wrote a cello piece based on an eerie scale unfamiliar to most Western ears. Instead of using the 12 "half tones" in the traditional Western scale, young Blackwood called on a 24-note scale of "quarter tones." His inspiration was an article on music in the *Encyclopaedia Britannica*. The exercise was mostly "playing around," he now acknowledges.

But since 1977 Blackwood—composer, professional pianist, and professor of music at the University of Chicago—has immersed himself in the alien microtonal world, systematically investigating a whole series of scales in theory and practice. The results include his *Twelve Études for Electronic Music Media*, a unique microtonal sampler ranging from a 13-tone piece to a new and eerie 24-note work. The études and the 525 pages of notes he has compiled for a book go far in establishing Blackwood as a pioneer in this hitherto little-explored territory of music.

Microtonality—dividing the octave into more than the traditional 12 intervals—is nothing new. The ancient Greeks used microtones, and Asian music has used them for centuries. But in Western music microtonality has always been at the fringes. It has been considered diffuse, disorganized, a dead end: primarily a playground for left-field composers. And before recent advances in electronic technology, in-depth systematic study of microtonal music was not really possible.

Renaissance and early baroque theorists discussed 19-, 31-, and 55-note tunings, as well as a 53-note tuning relating to ancient Pythagorean proportions. Around 1900 theorists developed 96-tone and even 612-tone scales! In practice, composer Ben Johnston has created 53-tone works, and Harry Partch worked extensively with a 43-note system. But work with quarter tones has been most popular. Such twentieth-century composers as George Enescu, Charles Ives, Alois Hába, Ernest Bloch, Béla Bartók, and Pierre Boulez have all used 24-tone scales.

Much of this music has required specially retuned, redesigned, and newly invented instruments. The few microtonal instruments

that have existed have been difficult to play and designed for specific tunings or even specific works. So microtonality remained an obscure curiosity—until recently.

In 1953 Karlheinz Stockhausen composed a microtonal study using primitive electronic equipment. But two decades would pass before the technology needed for a serious microtonal investigation was introduced: the logarithmic calculator and a musical instrument called the Scalatron. This Hewlett-Packard calculator made possible the swift numerical analysis involved in a microtonal study. Concurrently, Motorola's dual-keyboard music synthesizer achieved accurate tunings in any designated range of intervals. Suddenly tools were available both to examine microtonal theory and to play the music.

Motorola, interested in exploring the capabilities of its new instrument, found in Easley Blackwood the person to use those tools: a composer with an analytical mind, highly developed mathematical skills, deep understanding of musical harmony, and prodigious talent at the keyboard. Since the Scalatron's keyboard arrangement doesn't

change when a composer switches from one microtonal tuning to another, it takes a pianist with exceptional mental and digital dexterity to play a microtonal piece on this pianolike device.

With one of the 15 existing Scalatrons in his office, Blackwood studied the theoretical relationships and musical possibilities of every microtonal tuning from the 13- to the 24-note scale. His aim: to create playable compositions in each tuning to illustrate structures and musical possibilities—the traditional purpose of études. He intended to establish and broaden the theoretical mapping of each tuning from 13- to 24-tone and to devise comprehensible notation systems. He realized that a thorough study of chord progressions and harmony would provide future composers with a charted path. Each composer would no longer have to dive headlong into an unknown jungle of notes.

Half of the tunings—13, 14, 15, 16, 18, and 23—were virtually virgin territory. "In fact," Blackwood says, "reviewers of my grant proposal said, 'This is off the mark. There's a consensus among theorists that the thirteen-, sixteen-, and twenty-three-note tunings are of no musical use.' Well, there was a consensus to that effect. The only trouble was, they were all wrong."

What do the microtonal études sound like? Few people know what to expect. Even musically literate listeners anticipate hearing nothing more than random dissonance. But one listener who heard Blackwood's compositions wrote to him, "I was astonished at the melodic quality and emotional range of the pieces, which quite overcame the unnaturalness of the scales."

A primary element of the études is unexpectedness. Blackwood works with notes and chords not normally found in Western music. Each new phrase challenges the mind to recalibrate its sensitivities and adjust to music that at first sounds out of kilter. Yet it isn't merely an "interesting" intellectual exercise to be tolerated once, then avoided. The études are a delightful, rewarding surprise.

Public reaction has been favorable. Ironically, the most negative reaction to the études came from certain segments of



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the academic community. "Some East Coast academicians were disturbed by the twenty-one-note piece sounding rather like baroque music," remarks Blackwood. "They thought that didn't express the spirit of our times properly: 'Our times are ugly and terrible, and therefore our music should be ugly and horrible, and what's this looking back? This isn't progressive,' they said."

The pieces at times sound conservative because they are primarily illustrations. But Blackwood says, "These études stand on their own merit as compositions. My purpose was to express what is inherent in the different tunings. I've tried to discover the most musically appealing arrangements within each tuning—those chord progressions that will eventually become standard formulas as the tunings come into more widespread use." In this way he sees his études as a sequel of sorts to Bach's *Well-Tempered Clavier*.

Blackwood found some tunings easy to work with and relatively accessible to our 12-tone, Western ears; 19-tone was the easiest. Others, such as 13- and 23-note, were extremely foreign. Thirteen-tone, in particular, with no tonal relationships even remotely similar to the 12-tone scale, was very troublesome. "It is the most alien tuning of all; it

goes against the way the brain is hooked up," Blackwood says.

Commenting on Blackwood's opinion, University of South Dakota professor of psychoacoustics Jan Berkhout says, "Experimental data suggest that the coding of pitch information in the central nervous system involves pattern and feature detectors that are sensitive to the presence of small-integer [or simple-fraction] ratios of pitch. This amounts to postulating the existence of special circuits for the detection of fifths and fourths." Berkhout's statement casts doubt on the view expressed in music training and behaviorist conditioning programs that a mind is a blank tape on which anything can be recorded with equal ease. Yet on the other hand, various listeners have singled out 11 of the 12 études as personal favorites—suggesting that no one tuning is intrinsically more pleasing to all ears than any other. The exception is 24-note, the quarter-tone tuning. The composer isn't surprised. To the mathematical Blackwood, that tuning was the only theoretically uninteresting scale among the 12. "The best use for twenty-four is just to leave out every other note." Yet even that étude is haunting, a passacaglia that evokes *The Phantom of the Opera* (Bach's Toccata and Fugue in D minor).

Blackwood plans to continue his research, building on his earlier work and taking advantage of state-of-the-art electronic equipment, including an improved Scala-

tron. He plans a second recording with longer compositions in 15-, 16-, 21-, 22-, 23-, 28-, and 31-note tunings. The 31-note work will link Blackwood with Don Carlo Gesualdo and Girolamo Frescobaldi, sixteenth- and seventeenth-century composers who were fascinated with that tuning. Blackwood theorizes that some 12-tone tunings would have been discovered by early twentieth-century composers had World War I not deflected their development. He has investigated this idea in a set of études reminiscent of Ravel, Debussy, Rachmaninoff, and other turn-of-the-century composers.

Since his microtonal study began, Blackwood has seen little change in most theorists' inclinations. "They work with quarter tones, third tones, and whatever tones, but no one seems to think about dividing the octave equally into notes other than a multiple of twelve. But microtonal music has a future. The new generation of keyboards with computers have the capability to play in any equal tuning, any tuning whatsoever. The subject is difficult, even with the proper electronic hardware at hand. But I wouldn't be surprised if the peculiar resistance soon evaporates because people now have the wherewithal actually to hear it." ∞

Blackwood's Twelve Études for Electronic Music Media is available on record for \$9.95 from the composer at 5300 South Shore Drive, Chicago, IL 60615.

