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Quote, Unquote

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"It's hard to tell at this point, but I suspect this will cause student interest in South Africa to cool off."

A fund raiser for the U. of Cape Town, on violence in S. Africa: A38

"It's nice to have a change that encourages philanthropy."

Emory U.'s director of planned giving, on the new tax law: A31

"I'm challenging all scientists and engineers to think how their work is affecting other people."

Rep. George E. Brown, Jr., chairman of the House Science, Space, and Technology Committee: A26

"Every year we are a draft away from disaster. We may never see our best recruits."

Ron Polk, head baseball coach at Mississippi State U., on the major-league draft: A36

"I wasn't at all sure I wanted to write anything. The easiest thing is not to write."

Richard Berendzen, on his book about a scandal that drove him from the presidency of American U.: A19

"For my students the body is the enemy, to be beaten into submission."

Susan Bordo, a professor of philosophy: A10

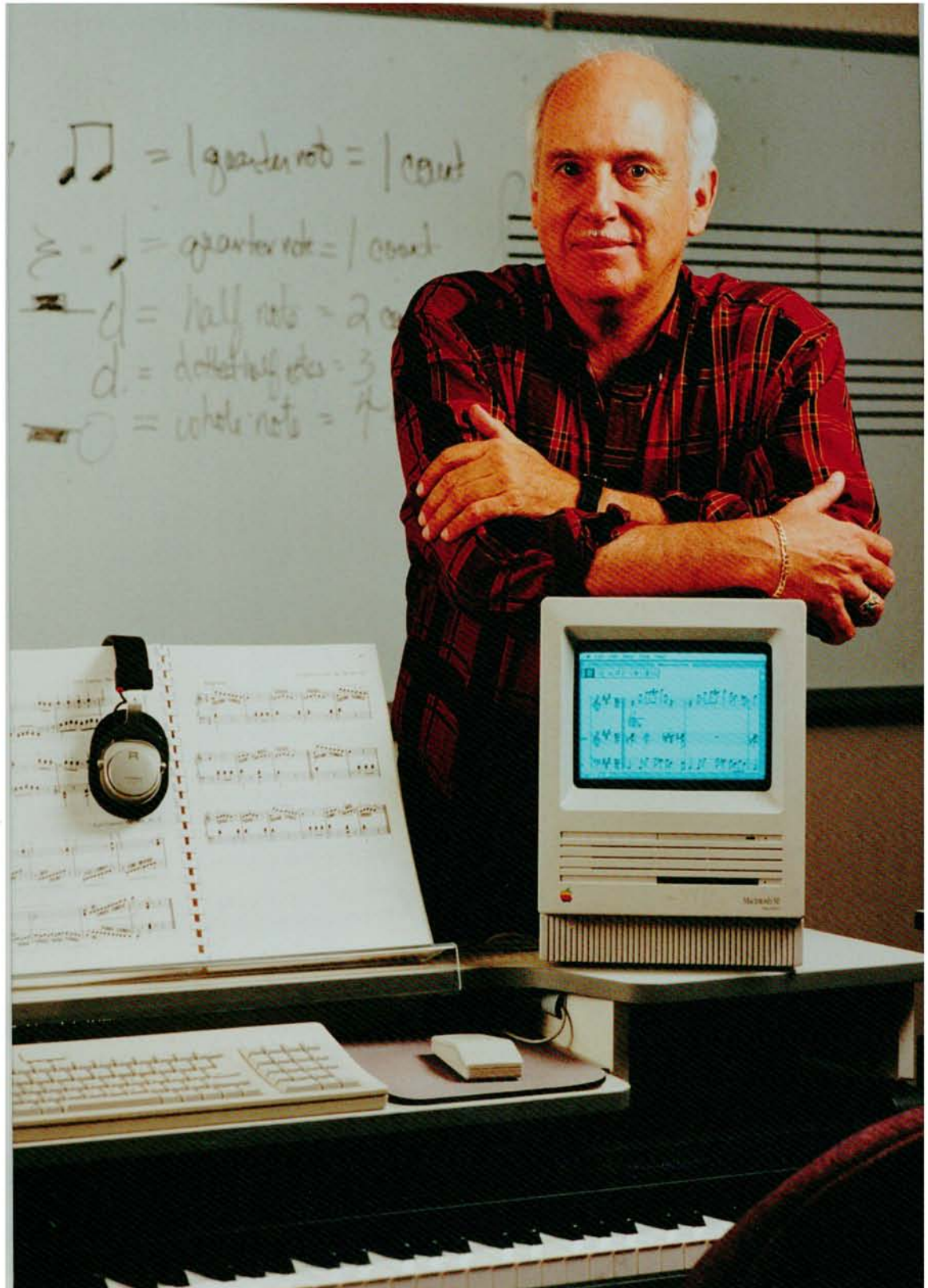
"There's been a change in philosophy that says that these kinds of calls should be made by the institutions, not by the coaches alone."

An athletics director, on colleges' new relationship with sneaker companies: A35

"Over-dependence on government contracts and tuition payments encourages short-term thinking."

The president of Oberlin College, on building strong endowments: B1

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Music and Technology, a New Duet: A23

Police at the University of Washington may have solved a string of nearly two dozen computer thefts with the arrest of a suspect who they say was caught stealing components from at least 10 computers.

Colleges and universities across the country have been investigating a rash of such thefts this year. Similarities in the crimes led some investigators to suspect that gangs might be preying on campuses.

Washington police said last week that they did not know whether the suspect, a 23-year-old man from Fullerton, Cal., was connected with computer thefts that had been reported at colleges in the West as far south as San Diego.

The suspect was carrying a pipe wrench, and officers later discovered that locks on 33 doors in a nearby office building had been snapped with a tool that they believe was a wrench.

Syracuse University is running an experimental project to disseminate government information over the Internet.

The "Electronic Government Information Service" is based on Gopher, a tool for organizing information on the network. The system features electronic copies of government reports.

Charles R. McClure, a professor of information studies at Syracuse, says the project is intended in part to shame the government into making better use of the Internet. "There is no reason why the government cannot provide these kinds of services," he says.

To explore the service, point your Gopher to ERYX.SYR.EDU. Those who don't have a Gopher installed on their systems can use the "telnet" function to connect to HAFNHAF.MICRO.UMN.EDU. At the prompt, type "Gopher." The computer will then ask the user for a system type, which can usually be answered as "VT100."

Once in Gopher, the information can be found under Other Gopher and Information Services/North America/USA/General/EGIS.

Still more government information is available on the Internet through a Commerce Department service, which is free until the end of this month.

The department's "Economic Bulletin Board," or EBB, offers one-stop shopping for data from the Departments of Commerce, Labor, and Treasury, the Federal Reserve Board, and other agencies. Users can tap into more than 2,000 files containing information on gross domestic product, employment trends, trade information, and regional statistics. Pricing for the service after the end of the month is uncertain.

To reach EBB, use the "telnet" command to get to EBB.STAT-USA.GOV. At the prompt, log in as "trial." For more information, call (202) 482-1986, or send electronic mail to AWILLIAMS@ESA.DOC.GOV.

Information Technology

The Latest in Technology Brings Fresh Tone to Teaching and Learning in Music

New tools at U. of Northern Colorado give students 'ability to learn at their own tempo'

By Peter Monaghan

GREELEY, COLO. ONE DAY IN 1986, while on sabbatical, Gene Aitken saw the future of music and realized he and his colleagues weren't teaching students enough about it.

Mr. Aitken, director of the jazz-studies program at the University of Northern Colorado here, was in Los Angeles to catch up on the latest in music technology. He concluded, he says, that unless students were being exposed to the new technology, which had become a fact of life in the commercial music profession, they were not being properly prepared for careers in music education, production, or performance.

He and his colleagues began to formulate plans for a state-of-the-art Music Technology Center here. In July, they opened it, with Mr. Aitken as director. The facility features the latest in computer systems for keyboard practice and for composition, as well as multimedia teaching tools and recording studios.

SOPHISTICATED TOOLS

The new tools make Northern Colorado's century-old School of Music as technologically sophisticated as any in the country. It has 440 undergraduate and graduate students and 32 full-time and 9 part-time faculty members. Over the last 15 years, the jazz-studies department and the music school, in general, have become well known nationally for innovative teaching and high-quality music performance.

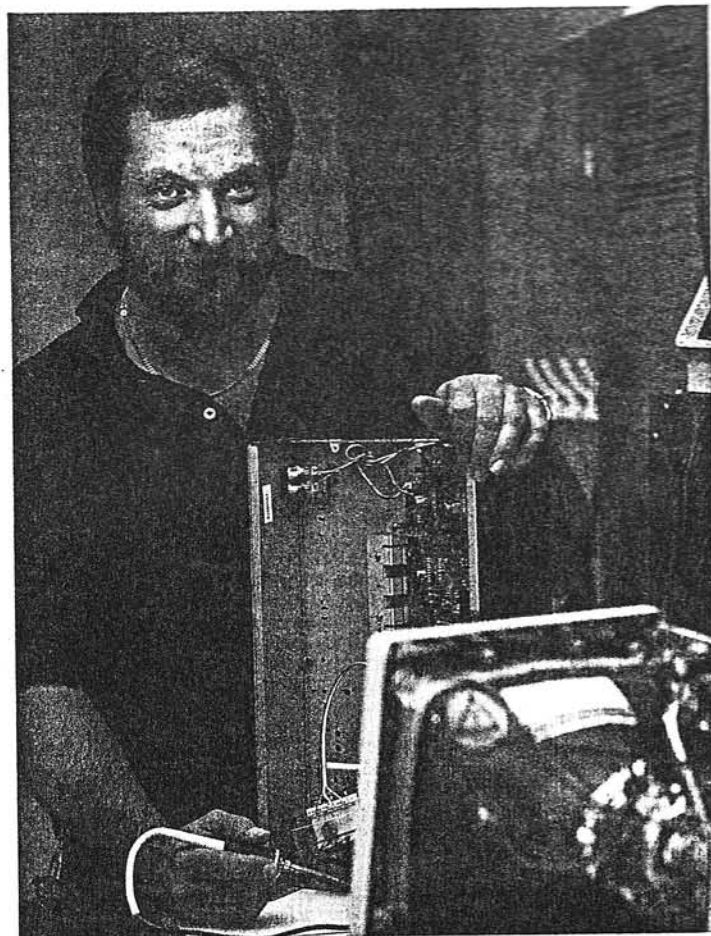
That reputation led to financial support for the new technology center when the Colorado Commission on Higher Education identified it as one of the five most accomplished programs of any kind in the state system and awarded it a special grant of \$1.5-million in 1988. That was soon supplemented by \$600,000 from the National Endowment for the Arts and \$175,000 from the university.

The school has been developing curricula over the last four years that use new, computer-assisted teaching methods, and has used them in classes for the past two years. The center uses many of the specialized music-education tools that are becoming available on laserdisk, CD-ROMs, and other media.

COACH AND PARTICIPANT

The technology, Mr. Aitken says, has brought fresh life to teaching, learning, playing, and composing: "When a teacher lectures and students sit there as listeners, those are not very exciting roles to be in. Now the teacher's role has changed to that of coach; the student has changed to a participant." Among the new tools' strengths, he says, is that "students have the ability to learn at their own tempo."

In the electronic-keyboard laboratory,



Tom Falgien, associate director of the music center: Computers can give a composer of a choral work "a very realistic idea of the way it will sound."

17 Apple Macintosh computers connected to Kurzweil keyboards act as tutors. They provide ear-training exercises and a variety of routines that deal with music performance, as well as with theory and history.

Some programs, for example, permit students to practice keyboard skills. All students enrolled at the school must take two years of piano, even those who study other instruments, unless they "test out" earlier.

Among the programs is "Band in a Box," made by PG Music Inc. of Buffalo, N.Y. It plays any of hundreds of standard jazz tunes so that a soloist on a piano or another instrument can practice along, increasing the amount of time the musician can work in a combo format. "It's hard for them to get together with the rhythm section all the time," explains Doug Snapp, a lab assistant and doctoral student here.

Soloists can choose the style in which they want the tune played—Latin, rock, reggae—and its tempo. They can also

transpose to another key, or quickly make an accompaniment tape on an attached cassette deck, to take home.

Computerizing practice, says Mr. Aitken, has been a great success in the two years in which students have been using the technology: "There's been a measurable increase in students' ability level, and students are practicing much more."

STRIKING COMPOSITIONS

Next door, in the computer/synthesizer lab, music is being composed in new and striking ways. The lab contains 32 workstations featuring Macintosh computers attached to Kawai K4 digital synthesizers. They spare student and faculty composers the onerous task of spending many hours copying out their compositions.

Computer sequencing, which is to composers what word processing is to writers, lets users see their compositions on a computer screen as they play them. Works in progress can quickly be played back, and

Continued on Following Page

Technology Brings Fresh Tone to Music Education

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composers can create parts for other instruments as needed, again saving many hours of copying.

Using MIDI technology (the Music Instrument Digital Interface, which lets computers control instruments), they can edit compositions. Users can also replay and record compositions directly to audio cassette or print them out on laser printers.

AN END TO 'BRAINGLESS WORK'?

A composer of a choral work, explains Tom Falgien, associate director of the Music Technology Center, "can put the piece into the computer and assign voices and get a very realistic idea of the way it will sound." Hearing such renditions of their work was not possible until the development of MIDI, short of rehearsal and a full performance of the score.

That capability, says Skip Wil-

Others have been developed by professors here, either from scratch or by designing multimedia computer programs to supplement existing products, including laserdisks and videotapes. Images from such media can be transferred directly onto the Macintosh screen and displayed in combination with explanatory text, snippets of sound, film, or animation, and other features. Computers allow users to search such products quickly for particular pieces of information.

'REPURPOSING' PRODUCTS

Students and professors have redesigned, or "repurposed," existing products in this way. Several students in a jazz-pedagogy class, for example, redesigned a two-and-a-half-hour instructional videotape made by David Liebman, a jazz saxophonist. Mr. Liebman himself gave the students advice on the product, which merged segments of the videotape with text written on a computer.

Another student, Kyle Gregory, recently repurposed a Miles Davis compact disk. His program gives details about the musicians on each track. Solos are displayed in musical notation to demonstrate patterns in them. The program even provides details of current events on the recording dates of each musical selection.

Says Mr. Aitken: "Today, if students are hoping to be employed by an institution of higher education, they have to have the technical background both in terms of MIDI and multimedia."

Currently about 20 music-education computer packages are sold commercially. But interactive multimedia is growing rapidly and is expected to be a big business that reaches customers in their homes and at educational institutions in a few years.

TUTORIALS AND DEMONSTRATIONS

Resistance to the teaching changes here has been minimal, says Shirley Howell, the director of the School of Music. Rather than force the new technology on professors, the school offered tutorials for students and faculty members and demonstrations at faculty retreats. So far, half the faculty has been won over to the computer-assisted techniques.

"We really haven't tried to convince them," Ms. Howell says. "What we have done is just set out to show them what is available and what it can do."

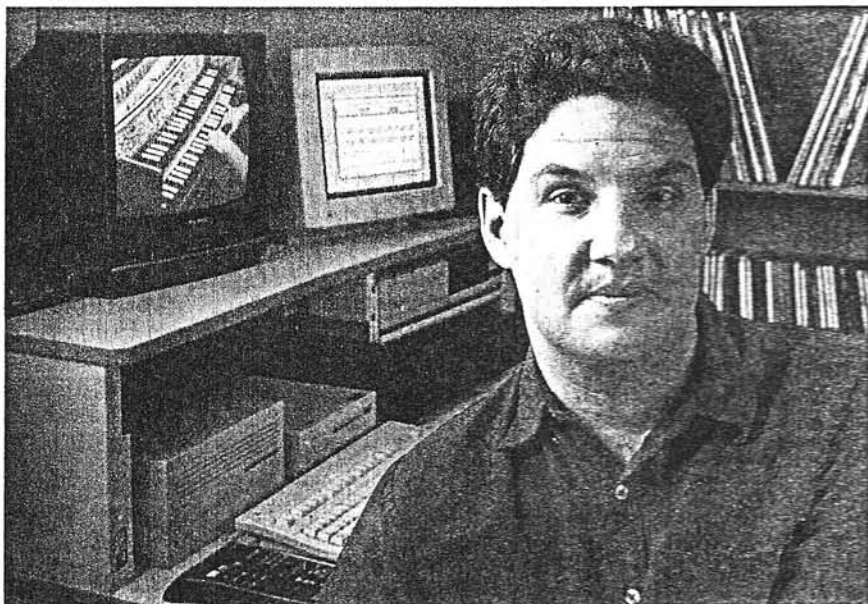
For Mr. Aitken, the changes are particularly gratifying because he thinks they hark back to the way young musicians used to learn jazz.

"We had mentors," he says. "That's how we learned our art, that's how we learned our trade."

He grew up in Seattle in the 1950's and began playing trumpet and bass with big bands at dance halls while still in high school. "At that time," he says, "jazz really was part of the culture."

"On Friday and Saturday nights, I would go into Seattle and watch Quincy Jones, go hang and watch, see what he was doing. I would watch Oscar Peterson. Now, you can't do that with these great artists, because the clubs don't exist any more."

"But we can see them now through this music technology." ■



Doug Snapp, a lab assistant at the U. of Northern Colorado's Music Technology Center. When it comes to music, talking or reading about it alone just won't do.

Computer Brings the 'Aural and Visual' to Jazz History

GREELEY, COLO. DOUG SNAPP grabs his mouse and clicks on an item in the "Piano Legends" multimedia program that he has loaded into his computer, and witnesses the technique and sounds of Art Tatum, in a rare film from the 1930's.

Clearly audible, and visible, are the Tatum trademarks—light touch and astonishing nimbleness.

At the same time, Mr. Snapp, a lab assistant at the University of Northern Colorado's just-opened Music Technology Center, can call up text that outlines Tatum's life and career. Among the details noted is the fact that Tatum had only partial vision, due to cataracts.

This biographical detail clearly excites Mr. Snapp, an accomplished jazz trumpeter. "Now they're getting the aural and the visual, and this information rein-

forces it," he says, conjuring up images of students in jazz-history classes using the technology.

EXPERIENCING THE SOUND

Of course, he adds, when it comes to music, talking or reading about it alone just won't do. "If you're in a class and you're discussing music history, well, music is an aural art, you cannot just describe a concept, say, rubato, or tenuto, or an articulation. Really, a student has to experience the sound of it."

The Piano Legends multimedia package was devised by Gene Aitken, director of the Music Technology Center here. To create the program, he "repurposed" a laserdisk, "Piano Legends," produced by Pioneer Artists, which features 20 of the piano greats of jazz.

To repurpose the laserdisk, Mr.

Aitken used "HyperCard" software for the Apple Macintosh computer to create a program that supplements the images on the videodisk with text and graphics. Using a Macintosh connected to a laserdisk player, users can gain access to particular bits of information on the laserdisk, without having to watch the disk from start to finish.

The disk is narrated by Chick Corea, who himself is one of the pianists represented. To place Tatum in historic perspective, Mr. Corea notes that he possessed "a harmonic sensibility that predated the complexities of bebop." As he says this, the film clip is running, and the user hears Tatum's pre-bop elaborations as Mr. Corea draws attention to them.

All that's missing is the smell of smoke from the jazz club that night. —PETER MONAGHAN

"I would watch

Oscar Peterson. Now, you can't do that with these great artists, because the clubs don't exist any more."

kin, assistant professor of music, "really has had a profound impact on our curriculum because students aren't handling in brainless work."

"They have too much pride," he says.

Mistakes that slip by on paper are apparent when compositions are played back by a computer with full orchestration.

The music school has many performing groups. They, and outside users, can record their works using two studios with state-of-the-art acoustics. The studios were designed by a world-renowned studio engineer, Russ Berger, for audio and video recording of soloists, small combos, and full orchestras.

IMPROVED RETENTION RATES

In the Computer-Assisted Instruction Lab, students have access to various interactive multimedia programs. At the lab's workstations, Macintosh computers operate CD-ROMs and attached video-cassette and laserdisk players.

"It's real exciting," says Kevin Murphy, assistant director of music technology, "especially when you consider the way we learn. If I have to study a certain musical form, and I see five descriptions in print, that's one thing. But retention rates increase rapidly when we use these different aspects of multimedia."

Some of the multimedia programs used here are commercially available products. For example, a series of CD-ROM packages provides written and spoken text, diagrams, animations, and musical excerpts about the history of Western music.

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