

Bern Academy of the Arts
Hochschule der Künste Bern
Haute école des arts de Berne

Dr. phil. Dorothea Schürch
Post-doctoral fellow, «Schreiben mit Stimmen»
Institut Interpretation
Fellerstrasse 11, 3027 Bern

A department of Bern University of Applied Sciences
Ein Departement der Berner Fachhochschule
Un département de la Haute école spécialisée bernoise

Interview with David Bernstein

October 6th, 2023, *Littlefield Concert Hall*¹, Mills College/Northeastern Campus

Professor of Music David Bernstein is an acclaimed scholar in Western Music Theory and current musicology. He is the editor of the renowned book on early electronic music: *The San Francisco Tape Music Center: 1960s Counterculture and the Avant-Garde*. Professor Bernstein has also served as the Head of the Music Department at Mills College.

Dorothea Schürch (DS): Thank you for taking the time for this interview. Regarding the recent development here at Mills College/Northeastern University, would you be so kind as to explain what has happened to the Center of Contemporary Music in the last two years?

David Bernstein (DB): That's a very recent development. Mills College is merging with Northeastern University. Given the uncertain future of experimental music at Mills it seems prudent to make sure that our musical legacy is preserved. One of the reasons why I'm on the campus today is to talk to our alumnae/ni about funding to support transferring all of

¹ History of the concert hall see: <https://performingarts.mills.edu/venues/littlefield-concert-hall/index.php>

our archival tapes, cassettes, DATs, and various media used over the years to document the history of experimental music at Mills. There are also videos, even one of Xenakis, who gave a lecture here, in this very place.

Extraordinary music has resounded in this Concert Hall since the early 20th century, when the Budapest String Quartet² and the Pro-Arte String Quartet³ performed new music from the early 20th century here. Since the mid-1960s when the *San Francisco Tape Music Center (SFTMC)* moved from 321 Divisadero Street to Mills and was renamed the *Center for Contemporary Music (CCM)*, Mills College has arguably been 'ground zero' for experimental music on the West Coast.

As Pauline Oliveros⁴ the founding director of the *CCM* put it so beautifully: «music is a community enterprise». Beyond the buildings and performance spaces, what has truly made this place special is that ethos, working as a community and supporting one another. The way the *CCM* is built – I use parentheses here because, in addition to several small studios, it largely consists of just practice rooms – makes it possible for students and faculty to work very close to one another and being able to go across the hallway, opening a door and talk to somebody or walk down the hall and meet with David Behrman,⁵ Maggi Payne⁶ or John Bischoff.⁷ Robert Ashley⁸ could be working in one of the studios. Placing the students in

² Budapest String Quartet existed from 1917–1967, was one of the best-known and most successful string quartets of its time.

³ Pro-Arte String Quartet existed from 1912–1941, it was the Court Quartet of Queen Elizabeth of Belgium, from 1941 it was offered a residency at the University of Wisconsin-Madison.

⁴ Pauline Oliveros (1932–2016), American composer, accordionist, and pioneer of electronic music was the founding director of the Mills *Center for Contemporary Music (CCM)*.

⁵ David Behrman (*1937) American composer and pioneer of computer music, he co-founded the Sonic Arts Union (1966–1976) with Robert Ashley, Alvin Lucier, Gordon Mumma. See:

<http://www.furious.com/perfect/behрман.html> (visited 1.1.2024)

«Works by Behrman and his colleagues added a human element to electronic music. Behrman was among the first composer to write music in which music performers play conventional instruments that interact with computers in real time. This performance practice continues to thrive at Mills today.» See:

<https://performingarts.mills.edu/center-for-contemporary-music/archives-history.php> (visited 24.11.2023)

⁶ Maggie Payne (*1945) American composer, flutist, video artist and Co-Director of the *CCM* alongside with Chris Brown in 2018.

⁷ John Bischoff (*1949) American composer, teacher and pioneer of electronic music.

⁸ Robert Reynolds Ashley (1930–2014), an American multidisciplinary composer renowned for his television operas, was the co-founder of the ONCE Group, which hosted the ONCE Festival in Ann Arbor, Michigan, from 1961 to 1966. From 1969 to 1981, he served as the Director of the *Center for Contemporary Music* at Mills College.

«Just as was the case during the period of the San Francisco Tape Music Center, the Ashley years were marked by an often iconoclastic irreverence for institutionalized art; for example, incoming graduate students at the *CCM* were warned by the Center's motto «if you're not weird, get out!» But those who did remain became part of an extraordinary collaborative environment. Ashley's organizational genius is evident in his operas as well as in the series of videos entitled *Music with Roots in the Aether* which document the work of an extraordinary group of American experimentalist composers including Gordon Mumma, Alvin Lucier, Pauline Oliveros, and David Behrman.

these small practice rooms created a certain atmosphere that was powerful and resulted in wonderful collaborative projects.

DS: Was the focus more on composing, more on music as a collective enterprise and less on instrumental skills?

DB: The primary focus on electronic music. But Maggi Payne, for example, was also a wonderful flutist. So, it's about all kinds of music making. Improvisation fosters the collective. The *CCM* was basically a collective. The way Robert Ashley taught was in the spirit of Ramon Sender, Morton Subotnick, and Pauline Oliveros⁹ when they moved the *San Francisco Tape Music Center* to Mills. It is a unique approach.

The question is what about 'now'. Unfortunately, it doesn't look like music at Mills is going to continue. We don't have a department anymore, and there are only two other fulltime faculty members. It's very sad. I and my colleagues have been fighting for the department for a long time. And we've won a lot of 'battles,' we've accomplished a lot, but the failure of the institution as a whole made it impossible to support our programs. And now, we are a very different sort of institution. Our emphasis is limited. It's not 'experimental.' It's more about technology as it's working in the commodity market. They're interested in artificial intelligence and virtual reality. But the emphasis is on training students for a specialized niche in the workforce, which is interesting and has the potential for unique outcomes. But it's more aligned with the commodity market. And that limits the type of things that they create and produce.

DS: Is there interest in the archive and studios by other institutions in San Francisco?

DB: Berkeley has their own electronic music program, which is very different than Mills. It's much more 'academic' They have had very good composers there – David Wessel,¹⁰ for example. He worked at *IRCAM*. If you ask the question of what characterizes an

During the 1970s, Ashley periodically shared the directorship of CCM with David Behrman. Behrman, a former member of the Sonic Arts Union (Behrman, Ashley, Gordon Mumma, and Alvin Lucier) specializes in live electronic music. Until the 1960s, most electronic music was designed to be played back to its audience on magnetic tape.» see <https://performingarts.mills.edu/center-for-comtemporary-music/archives-history.php> (visited 24.11.2023)

⁹ The American composers and pioneers of electronic music, Ramón Sender (*1934 Spain) and Morton Subotnick (*1933), founded the *San Francisco Tape Music Center (SFTMC)* in 1962. Ramón Sender studied piano and composition, and composer Subotnick was a distinguished clarinet player. At the SFTMC, they collaborated with the composer, pioneer of electronic music, and accordionist Pauline Oliveros (1932–2016), as well as with the painter and multimedia light artist Antony Martin (1937–2021). In the program of the *SFTMC* called the *Sonic Series*, improvisations by Sender, Subotnick, and Oliveros were a significant focus alongside the tape music compositions.

¹⁰ David Wessel (1942–2014), American musicologist, composer and improviser. In 1988 he became the Director of the UC Berkeley *Center of New Music and Audio Technologies (CNMAT)*.

institution like the *GRM*¹¹ or the *CCM*, the defining element is quite apparent. It is the result of the people who are there – the community of artists, scholars, scientists, and others. They are the ones who create the entity; it's not the building or an idea on paper, but the people. And right now, we don't have anybody really. We don't have John Bischoff, Chris Brown,¹² Maggi Payne, they're not here. James Fei¹³ is the one person who's a specialist in electronic music and he was part of our Intermedia program. We had the composers Alvin Curran,¹⁴ Roscoe Mitchell,¹⁵ Zeena Parkins,¹⁶ all these people were here, and they're not here anymore. So, **it really** would be starting from scratch. We could start it from scratch with some of our former students. I'm a perennial optimist. I'm an idealist. But I've been working hard to try to keep this going without success. And I'm not the only one. Fred Frith¹⁷ is gone. Zeena Parkins is gone. William Winant¹⁸ is the one jewel who is an amazing improviser and one of the great percussionists in the world. He's a very lovable character. You should talk to him; he is an absolute genius. He can talk about the history. I'm a historian but Willie was part of the history. I learned a lot from him and from other people like Maggi Payne. They are very generous colleagues. Willie worked with Lou Harrison who **donated John** Cage's percussion instruments to Mills. They're in his office, the instruments that were played at Mills during the famous percussion music concerts with the dance department. Now that's a part of our history. The innovative aspects of the music program resulted from the collaboration with dance. They were the ones who were the really forward-looking. Darius Milhaud¹⁹ was here,

¹¹ The *Groupe de Recherches Musicales (GRM)* [musical research group], was founded in 1958 by composers and *musique concrète* theorists Pierre Schaeffer (1910-1995) and Pierre Henry (1927-2017), as part of *Radiodiffusion-Télévision Française (RTF)*. The *GRM* was the first studio exclusively dedicated to electroacoustic music.

¹² Chris Brown (*1953) American composer, pianist and electronic musician known for inventing interactive electronics and computer networks for improvisation. He teaches composition and electronics at Mills College, where he became co-director of the *CCM* alongside with Maggi Payne in 2018.

<https://performingarts.mills.edu/center-for-contemporary-music/archives-history.php> (visited 1.1.2024)

¹³ James Fei (*1974, Taiwan) is an electronic music composer, saxophonist, and clarinet player. He studied and worked with Alvin Lucier and Anthony Braxton. He has been an Assistant Professor at Mills since 2006. His recordings are released on Leo Records and Composers Recordings, Inc. (CRI).

¹⁴ Alvin Curran (*1948) American composer and electronic musician. He co-founded *Musica Elettronica Viva* with Frederic Rzewski and Richard Teitelbaum in 1966. From 1991–2006, he held the position of *Darius Milhaud-Professor* at Mills College.

¹⁵ Roscoe Mitchell (*1940) is an American composer, saxophonist, and flute player, and co-founder of the *Art Ensemble of Chicago*. In 2011, he was named the Darius Milhaud Chair of Composition at Mills College.

¹⁶ Zeena Parkins (*1956) American composer and multi-instrumentalist and harpist in experimental, free improvised and contemporary music, she is a 2019 Guggenheim Fellow and served as a Professor at Mills Music Department.

¹⁷ Jeremy Webster 'Fred' Frith (*1949) is an English multi-instrumentalist, composer, and improviser. He served as a Professor of Composition at Mills College until 2018.

¹⁸ William Winant (*1953) American percussionist not only for contemporary classical music but also in genres like noise rock, free improvisation and jazz.

¹⁹ Darius Milhaud (1892–1974) was a French composer, conductor, and teacher, and a member of the Group of Six along with Georges Auric (1899–1983), Louis Durey (1888–1979), Arthur Honegger (1892–1955), Francis Poulenc (1899–1963), and Germaine Tailleferre (1892–1983). His compositions are characterized by elements of Jazz, Brazilian music, and polytonality.

and Milhaud was very open to experimentation. He was an *enfant terrible* in the early 20th century. In 1941, when he came to Mills, he was past that period and writing more conventional music, but he worked with polytonality. It was a different language. He was kind of radical in his own way.

We've been talking about the prehistory. There are many chapters to this story, the different directors of our *Center for Contemporary Music*; faculty members like John Bishoff, Maggi Payne, and Laetitia Sonami. Each one of those wonderful artists opened a new chapter, a new world. Regarding the archive, I'm working getting all the tapes digitized. And there are 270 CDs. And I'm trying to get the funding right now.

We tried very hard to propose programs that we could offer to Northeastern University. We didn't get very far. It's a very powerful entity. *CAMD*, which is a *College of Arts, Media and Design* includes the music department. I met with the Dean several times; they have their own agenda. I don't know about the politics, so I hesitate to make any statements about it. She seemed very interested and supportive. I tried hard, and I don't think any of my colleagues have succeeded in having real substantive discussions about the future.

DS: Mills promoted an experimental approach to composition, embracing improvisation.

DB: Yes. Pauline Oliveros was an early influence in that development. When the *Tape Music Center* moved to Mills, she came here with an ethos and aesthetics that emphasized on music as a «community enterprise». And as I was saying about the idea of the *Center for Contemporary Music* and this hallway with all these offices that facilitated people crossing the halls, the strength of the *CCM* is not only that it attracted a lot of radicals who wanted to go against the status quo, and that has to do with living in the Bay Area too, which is part of the culture here. But it also was because of the layout and the people who were there, like Ashley and Oliveros, who looked at music as a community enterprise. It wasn't just training individuals to work in their little 'cubby holes.' It was about bringing people together and to work together. And improvisation is a natural fit within that ethos because improvisation is about making music by a group.

DS: I was astonished to discover the workshop character of the SFTMC. Where does this come from?

DB: That particular idea of music as a «community enterprise» comes from the way they were working in that little studio at the *SFTMC*. They're not working in fancy research laboratories. They're working together, side by side, with all the different instruments. It's the layout of the studio and the idea of working as a group. That's probably the most important aspect of what Oliveros came to Mills with and that's the basis of all her music. And it's not only Oliveros, Ashley was that way too, but different. He was creating operas with all these

very talented people like Blue Gene Tyranny.²⁰ Have you seen the collection of videos titled *Music with Roots and the Aether*?²¹

There were different periods in Mills history. Terry Riley was here. But all these people were all about working together. Just think about Terry Riley's *in C*.²² What could be more of a musical representation of community than that piece? In the United States, particularly on the East Coast, the European approach is dominant and institutionalized in places like Harvard, the *Columbia-Princeton Electronic Music Studio*, or in Berkeley. The contrast with the approach at Mills is quite distinct. I've used the term *Music in the Fault Zone*.²³ I come from the East Coast. I was born in Manhattan, and I went to school at Columbia University. I'm a New Yorker, although I now consider myself a Californian with a New York accent. I've become more of a free-thinker, as a result of being exposed to my amazing Mills colleagues, living in the *Fault Zone* where things are not always stable. There's a history of these rascally and anarchistic types that came to the Bay Area from the communes or places up in the north in California. There's a rich tradition of this kind of radicalism in the San Francisco Bay Area.²⁴

Now we're in a different situation where living in a megalopolis, or whatever you want to call it. In a sense, we are a remnant of that past. Just look at the architecture of our concert hall, consider its heterogeneity. You have a Latin text, Gregorian chant, Native American art, – it's pretty wild.

²⁰ Robert Nathan Sheff (1945–2020), alias 'Blue' Gene Tyranny, American avantgarde composer and pianist.

²¹ Robert Ashley: *Music with Roots in the Aether, Opera for television*, Lovely Music, New York 1976, 7 videodiscs. Contributors David Behrman, Philip Glas, Alvin Lucier, Gordon Mumma, Pauline Oliveros, Terry Riley, Robert Ashley, see: <https://searchworks.stanford.edu/view/12100775> (visited 1.1.2024) https://www.ubuweb.com/film/aether_ashley.html (visited 1.1.2024)

<https://archive.org/details/ashley-robert-music-with-roots-in-the-aether-2000/Ashley%20-%20Robert%20-%20Music%20with%20Roots%20in%20the%20Aether%202000/page/18/mode/2up> (visited 1.1.2024)

²² Terry Riley: *in C*, 1964.

A minimalistic composition for an undefined number of performers. The premiere of Terry Riley famous composition *in C* at the *SFTMC* was at the 4th and 6th November 1964. *in C* was performed by Terry Riley, Pauline Oliveros, Morton Subotnick, Ramon Sender, Steve Reich, Jon Gibson, Jeannie Brechan, James Lowe, Sonny Lewis, Mel Weitsman, Warner Jepson, Stan Shaff, and Phil Winsor with visual environments by Anthony Martin. See David Bernstein: *The San Francisco Tape Music Center, 1960s Counterculture and the Avant-grade*, Berkley, Los Angeles, London: University of California Press, 2008, S.276.

²³ «Music in the Fault Zone – Experimental Music at Mills College (1939 to the present) – Presented by Mills College Music Department and the *Center for Contemporary Music*. A four-day festival of concerts celebrating the Music Department's extraordinary musical legacy and bringing together musical luminaries from Mills' past, present and future includes work by: Pauline Oliveros, John Cage, Lou Harrison, Daniel Schmidt, Darius Milhaud, Roscoe Mitchell, Robert Ashley, Anthony Braxton, Terry Riley, Henry Cowell, Steed Cowart, and more.» See: <https://performingarts.mills.edu/programs/mills-music-now/fault-zone/index.php> (visited 1.1.2024)

²⁴ «[I]t would be a mistake to present the history of the *Tape Music Center* apart from its exciting artistic context» see Bernstein: *The San Francisco Tape Music Center*, S.2

Bernstein points out the San Francisco Actor's Workshop, the San Francisco Mime Troupe, the Committee Theater, the Dancer's Workshop, the Open Theater, Anna Halprin and the Dancer's Workshop, Terry Riley, La Monte Young, Steward Brand and the Trips festival and many more.

DS: *Were political ideas, political movements, and organizations influential?*

DB: The 1960s was a very interesting period in American history. The San Francisco Bay area was arguably 'ground zero' for the emergence of the counterculture in the United States.²⁵ There was kind of a meeting of various radical groups in San Francisco during the 60s.²⁶ A lot of anarchists from Northern California had moved to the Bay Area. San Francisco right now is very different. In those days, it was a place for radicals, real radicals. The 'hippies' were different. They were more about having a good time, even though they were also trying to reimagine society. But other people were more serious. San Francisco was a place where you could be a radical at that time. The San Francisco Bay Area area has an extraordinary history.

DS: *Is there something anarchistic about the CCM? The SFTMC started by moving out of the Conservatory to Jones Street in 1961. The grant from the Rockefeller Foundation 1966 brought funding for the SFTMC under the condition that it moves to Mills and merge with the Mills Performing Group. However, it didn't bring them much luck, as Sender and Subotnick left after the first year.*

DB: It's good that you brought that up. The Rockefeller Foundation helped to create these entities. And the politics behind that development is very interesting. There's a book about the period during which all these grants supporting the arts in the '60s came about. The question is whether there was a government conspiracy behind what transpired. I think it's true that the '60s were a time of left-wing radicalism in the United States. And there were worries that the Rockefeller Foundation and other foundations have supported places like the *Center for Contemporary Music* in order to divert 'rascally anarchistic types' into making art rather than working towards political change. Why was Darmstadt founded? Weren't they worried at that point in time about the conflict between the East and the West? How do you counteract the cultural influence of the Soviet Union? And how do you establish 'the West' as a strong cultural entity? All those developments occur in a socio-political environment.

Today, it seems that Music at Mills is coming to an end. We no longer have a critical mass of faculty here. Some left, some retired, and their positions were not filled. We no

²⁵ The term *counterculture* goes back to Theodor Roszak, implying a 'reassessment of cultural values', see Bernstein: *The San Francisco Tape Music Center*, S. 8.

Theodor Roszak: *The Making of a Counter Culture: Reflections on the Technocratic Society and Its Youthful Opposition*, London, Faber & Faber, 1970. In this book the American historian Theodor Roszak (1933–2011) defines counterculture as an effort «to discover new types of community, new family patterns, new sexual mores, new kinds of livelihood, new esthetic forms, new personal identities on the far side of power politics, the bourgeois home and the consumer society.» see Roszak: *Counter Culture*, S. 66.

²⁶ «The Tape Music Center was part of a larger avant-garde artistic scene that included such groups as the San Francisco Actor's Workshop, the San Francisco Mime Troupe, the Committee Theater, the dancer's Workshop. And the Open Theater, as well as a diverse community of independent writers, artists, musicians and dancers.» See Bernstein: *The San Francisco Tape Music Center*, S. 2.

longer have amazing students like for example, Paul DeMarinis.²⁷ If Northeastern University decides to recreate or continue the development of our music program, it could evolve. But the reality today is that the final days of Mills music have arrived. This is the first time I'm talking like this, because I'm someone who doesn't give up easily. Over the years we worked very hard to support the *Center for Contemporary Music* and really got things going. But this is a tough time not only here at Mills but also in the history of the United States and the world.

DS: Did Sender and Subotnick chose the name Tape Music Center to avoid the European debate about electronic music and musique concrete?

DB: I don't think they cared about Europe. Magnetic tape is a very neutral thing. It was only discovered during World War II. It was a special medium, which created a lot of possibilities. I don't think they were interested in *Elektronische Music* and *musique concrète*. They were more open and less concerned with stylistic definitions. But getting an *Ampex* tape machine, getting some of the German stuff, some good equipment, was a big deal. And they also invented their own instruments, like the Buchla.²⁸ So, they were very independent from those studios.²⁹ I don't think they really cared about Europe.

It's different in Europe. I lived for a while in East Berlin before the wall came down. I was doing research at Humboldt University. I also visited the *Sächsische Landesbibliothek* in Dresden. My research was on the history of music theory, a very 'dusty,' scholarly preoccupation. I went to a concert in Dresden. They played Varèse. That was probably pretty radical for East Germany at the time. It was not like West Germany. Everything was in disarray. I was invited to present a lecture in this beautiful building in a big room. And I didn't expect a lot. I was going to talk about music theory in the USA. I thought there would only be about 10 people. But there were more than 50 people lined up in the hallways, despite the fact that I was late due to the bad train service. (I was traveling back from a trip to Dresden.) When I finally arrived, they were all waiting, just for me. I was just a grad student. I didn't even have my PhD yet. A large group of students attended my lecture simply because I was an American. At one point during my talk, there was this band playing music in the courtyard and it became so intrusive I couldn't speak over it. I reassured them, saying that

²⁷ Paul DeMarinis (*1948) American visual and sound artist, Professor of art at Stanford University. He received a M.F.A. in Electronic Music and the Recording Media from Mills College in 1973 where he studied composition with Robert Ashley and Terry Riley.

²⁸ The *Buchla* was the first modular synthesizer, commissioned by Ramón Sender and Morton Subotnick in 1965 and installed at the *San Francisco Tape Music Center*. It was named after its inventor, Donald 'Don' Buchla (1937–2016). Buchla, who studied physics, physiology, and music, is a pioneer in electronic music and sound synthesis. In the 1960s, electronic music was primarily composed using wave generators, oscillators, or *musique concrète*. The *Buchla 100* was relocated to Mills College in 1966.

²⁹ «The facilities in the studio were modest; this led the composers to invent new sounds from everyday objects, often enhancing their acoustical properties with contact microphones and a piano soundboard for reverberation.» See Bernstein: *The San Francisco Tape Music Center*, S. 10.

coming from Columbia University, I was to teaching right by Broadway where there was lots of traffic noise. I was accustomed to this sort of situation, so they shouldn't worry about it. However, there was an official in the front row who seemed very nervous, because the secret police were responsible for the disturbance, and all the young students knew that. They did military marching exercises every day at 12 o'clock.

DS: Is there something akin to a historically informed practice for presenting tape recorder pieces? I have found very little indication on how to present these pieces in concert, including the placement of the loudspeakers, etc. It seems there are more sketches than scores available.

DB: That's a good question. I have seen **sketches that were** arguably for the composer to envision what he or she wanted and not made for the dissemination of the work played by others.

DS: Considering the knowledge required for working with tape, it's not only about analog technologies; unique instruments were also created. I am thinking more of reenactments, the redosings

DB: ...of performance practices.

DS: The redoing of performance practices, particularly those that the equipment you have upstairs necessitates.³⁰

DB: I was interested in exactly what you're talking about, but perhaps for other reasons. When I began my work on Pauline Oliveros and the *Tape Music Center*, I wanted to learn how to reproduce her performance practice. I purchased several *Hewlett Packard* oscillators and some reel-to-reel tape machines. Unfortunately, none of them worked well.

DS: The tape recorder evoked new musical formats, brought up the idea of extended instrumental and vocal practices, the working with loudspeakers, with the acousmonium...

DB: The tape becomes an instrument, not just used for documentation. It was a way to work with electronic sound that didn't require the fancy studio setups used in a lot of those research units. With two good *Ampex* tape machines and a couple of *Hewlett Packard* oscillators you can get at a surplus store, you could do amazing things, creating your own performance practice based on the knowledge of how the **machines work**. It's not easy to do. One needs training to get those old machines to work and to think in multiple temporalities. It's about doing something in the present and then reacting to what happened in the past and then thinking about what's going to happen in the future through the tape delay setups. Trying

³⁰ Facilities of the CCM: <https://performingarts.mills.edu/center-for-contemporary-music/facilities.php> (visited 4.1.2024)

to control what's going on without having control. It's almost like a form of artificial intelligence. It's more of a duet with the machine, like playing with somebody else, but you also must control it to a certain extent. You don't really know what's going to happen because it gets complex with all the kinds of feedback. It brings to the forefront the notion of multi-temporality, which is essentially what music is about. And when you're an improviser, it becomes even more important because you're really composing in real time.

DS: The loop function brings back the soundscape and the dynamics of an element, repeating it with absolute precision. The machine can keep on doing it endlessly. No notion of fatigue, no variations. Listening entails understanding the instrumental and/or technical setting, the constraints of the materials, the functioning of the interfaces, and the mediality of what you hear.

DB: Yes, it's about the technique, how you create this music, how you have control. You have to listen in a multi-temporal way. It's about ear training. You have a feeling for when to start a new idea. Sometimes if you listen to Oliveros's music and try to think about what's happening, you hear a little gesture and then it repeats. For how long does she sit with it? And it keeps on building and it starts to change; then she adds something new. I try to get into the actual music itself, not to try to reduce it to any kind of a schematic. For example, what is the musical idea for *I of IV*³¹ or for *Bye Bye Butterfly*?³² Understanding her creative

³¹ Pauline Oliveros: *I of IV*, 1966, <https://www.youtube.com/watch?v=2kJD0dbE9Ow> provided to YouTube by Columbia/Legacy (visited 3.1.2024)

I of IV was made in July 1966, at the University of Toronto Electronic Music Studio. It is a real time studio performance composition (no editing or tape splicing), utilising the techniques of amplifying combination tones and tape repetition. The combination tone technique was one which I developed in 1965 at the *San Francisco Tape Music Center*. The equipment consisted of 112 sine tone square wave generator connecting to an organ keyboard, 2 line amplifiers, mixer, Hammond spring type reverb and 2 stereo tape recorders, 11 generators were set to operate above 20,000 Hz, and one generator at below 1 Hz. The keyboard output was routed to the line amplifiers, reverb and the to channel A of recorder 1. The tape was threaded from recorder 1 to recorder 2. Recorder 2 was on playback only, Recorder 2 provided playback repetition approximately 8 seconds later. Recorder 1 channel A was routed to recorder 1 channel B, and recorder 1 channel B to recorder 1 channel A in a double feedback loop. Recorder 2 channel A was routed to recorder 1 channel A and recorder 2 channel B was routed to recorder 1 channel B. The tape repetition contributed timbre and dynamics changes to steady state sounds. The combination tones produced by the 11 generators and the bias frequencies of the tape recorders were pulse modulated by the sub-audio generator." See Pauline Oliveros: <https://paulineoliveros.bandcamp.com/track/bye-bye-butterfly> (visited 3.1.2024)

«This is a good example of Oliveros' earlier electronic music using a configuration of tape recorders patched into each other with magnetic tape spliced in loops so that a form of 'automatic generation' system was created by feedback. [...] Oliveros used bias frequencies of tape recorders and difference, or lower 'ghost tones' produced by the interference of very high frequencies.» Allmusic review by 'Blue' Gene Tyranny, see: <https://www.allmusic.com/album/i-of-iv-1966-in-new-sounds-in-electronic-music-mw0000879275> (visited 3.1.2024)

³² «Bye Bye Butterfly is a 2 channel tape composition (with an enclosure) made at the San Francisco Tape Music center in 1965. It utilises 2 Hewlett-Packard oscillators, 2 line amplifiers in cascade, a turntable with record and 2 tape recorders in delay setup. The composer arranged the equipment, tuned the oscillators, and played through

process, which is intuitive and magical, is probably impossible. Nevertheless, I still want to keep trying because I don't want to reduce her music into diagrams. That would be absurd. My goal is to try to understand how her music developed over time and how she refined her way of hearing in multiple temporalities.

DS: Thank you for this interview.

the composition in real time.» See Pauline Oliveros: <https://paulineoliveros.bandcamp.com/track/bye-bye-butterfly> (visited 3.1.2024)

«[It] bids farewell not only to the music of the 19th century but also to the system of polite morality of that age and its attendant institutionalized oppression of the female sex. The title refers to the operatic disc, Madame Butterfly by Giacomo Puccini, which was at hand in the studio at the time and which was spontaneously incorporated into the ongoing compositional mix.» – PO: The Transparent Tape Music Festival, San Francisco, see: <http://sfsound.org/tape/oliveros.html> (visited 3.1.2024)