Rhythm, Affordance, Recording, and the Ontology of Performance: New Frontiers for Musicology

Rythme, affordance, enregistrement, ontologie de la performance dans l'EDM : de nouveaux objets d'étude pour la musicologie

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Early research

1 ELECTRONIC DANCE MUSIC AS A PHENOMENON began in the 1980s, and people began to think about it academically in the 1990s. The first people to do so were primarily sociologists, as well as scholars in cultural studies. That also reflects the general history of the study of popular music within the academy: musicologists were unfortunately late to the table, so we started to see more musicology of popular music in general in the late 1990s, but typically focusing on canonical groups—The Beatles, classic rock, and things like that. As I was beginning to develop my career as a scholar of music theory and musicology, I was very interested in this phenomenon, and I wanted to bring a musical perspective to it. It is quite clear that people care so much about this music, and they are very devoted to it; and it is not only the social experience, but also the sounds of the music that draw them to it. It is a whole phenomenon in which the music is completely integrated, so musicologists specialize in that, and think about that in rigorous and sophisticated ways—that is where musicology needed to intervene.

2 I really started with the music and with compositions or tracks that caught my ear: I tried to understand how they worked. One of the first things I noticed is that the music has very distinct layers: the bass drum, the snare drum, the various percussion layers, the bass line, any melodic layers that you might have, and these are presented distinctively, with very distinct tone colours, and there are often particular rhythms
associated with each line within the texture. The second thing is that this is dance music, and it is very obviously rhythmic. When I was starting to work on Unlocking the Groove (2006), there was a particular issue and kind of response that I got both from the musicologists, as well as from a fair number of fans of dance music: when I told them I was studying rhythm in electronic dance music, they would say: “Well, what are you going to talk about? It is all ‘poom poom poom poom’ or “it is all 4/4, end of story”. To me it seemed that couldn’t be the end of the story, because if this music is fascinating to people, and it is dance music, there must be something about the rhythm that is fascinating to people. In Unlocking the Groove, I try to figure out what that is.

Interpretative multiplicity

3 A bias of musicology is to find complexity in music, that is what is valued—and a particular kind of complexity: crazy rhythms, hidden things that only a scholar can reveal, and so on—and particularly, the complexity you can find in a score. Well, this music does not have scores, so rather than trying to reveal a particular kind of structural complexity, what I am arguing is that the music supports diverse and rich experiences of time, so it is structured in ways that people can find different rhythmic paths through it, and even individual people can change those paths, pursue different paths, play with them, and this is happening all at the same time, so that this is a temporally rich and diverse experience for people to interact with. I am trying deliberately to use words like “rich”, rather than “complex”. You can say it is complex, but that has particular connotations in musicology that I am trying to avoid.

4 Musicology, and particularly music theory as well, have long been invested in, and been caught up in a relationship with the canon of Western art music and its greatness. If you go to a traditional concert hall, an old style concert hall—not like this [Cité de la Musique-Philharmonie de Paris]—, you will often find figures of white Europeans from the 19th century, who are meant to be the “great musicians”, and musicology was very much about demonstrating their greatness. I am not saying that electronic dance music is not great. Of course, I personally think it is great, but as a popular music scholar, I don’t see that as my project, and I actually even think that scholars of Western classical music should question that project. We’re here to talk about things like how music works, how music functions in society, and you can look at a whole range of music without trying to prove something about whether it is enduring or good. It might be interesting for those reading this interview to know that I faced a lot of challenges in this, especially in the early stages of my research. People asked, including professors, questions such as: “how do you know that this music is going to be worth studying? Is it going to be around in ten years?” I face less of that now, which is a good thing.

5 The question is, as I put it: how does this music creates diverse or rich experiences of time? This is what I call “interpretative multiplicity”, but in particular, I am making that argument by addressing ideas about rhythm and meter. There are so many different kinds of tracks that I could talk about in terms of interpretative multiplicity. You mentioned the Chemical Brothers track, “Piku”. The reason that I had picked that is that it is a very simple and straightforward example of the layering approach, in that you have two layers that are not exactly synchronized. It allows the listener to focus on one layer or on the other, or to experience the asynchrony—or “disynchrony”—of the two layers in an interesting way. Another track that is more rhythmically complicated,
that I discussed in my book, is Carl Craig’s track, “Televised Green Smoke”, that has so many things going on in it. It starts out with a very simple pattern, you might hear as “pom pom... pom pom... pom pom...”, almost like a triple rhythm, but then another sound comes in and you start to hear it as “pom... pom pom... pom... pom... pom...”, and finally, the bass drum comes in, and when the bass drum comes in, it does so in a place where you don’t expect it. So this creates what I call “turning the beat around”. What happens then is that there is a momentary sense of disorientation, so that the previous pattern plus the bass drum sort of sounds like “po-do pom... pom... po-do pom... pom...”, except for a moment you are just not sure which pattern you are supposed to follow. And then as more patterns come in, it sort of confirms one of the interpretations, but the previous feeling of different layers having their own temporality is still present.

**Work and Performance; Music Theory and Ethnomusicology**

6 As I said, *Unlocking the Groove* was published in 2006, and at the time I wrote it, there was no musicological research on electronic dance music. Well, there was one ethnomusicology book (Fikentscher, 2000), but there were no other books that dealt with the musical sounds in a detailed way at that time, so there were no methodologies for talking about the sound in rigorous ways, as well as representing it for readers. I had to develop those kinds of things from the ground up, to a certain extent. Both my books involved field research and focused on musicians’ practices. This draws from ethnomusicological methods, but contemporary ethnomusicology is more typically focused on social and cultural questions, which I also consider—but that is not my primary focus. It is more about what musicians are doing and why. Both books involved that, but *Unlocking the Groove*, the earlier book, is more a book of music analysis, so it does have quite a bit of detailed discussion of individual recordings—I call them “tracks”, while “recording” just refers to the recorded composition. It focuses on the tracks by themselves, for the purposes of study and clarity, and finally, it focuses on rhythm and meter as a particular issue.

7 So even when I was writing that, I had the idea of a second book, because studying records in isolation is not representative of how they are experienced in performance, particularly since performance is the most important way of experiencing electronic dance music. So, certainly when musicians make records, they care about what the record sounds like by itself, they want it to be a good record in and of itself, but ultimately it is meant to function in relation to other records, and to fit well within a DJ or laptop performance, where it is going to be combined, layered, altered in various ways. I always wanted to study how that worked, and once I felt that I had a good basis for talking about the essential features of the recordings, then I could start to bring that to bear on the more complex situation of actual performance. In *Playing with Something that Runs* (2014), I am looking at DJ and laptop sets, as the title suggests, and I am looking at actual performances. First of all, I would say that it is still unusual to do detailed analysis of actual performances in music studies. There are people studying live performances, but classical music performances that you can buy, for instance. Studying live performance in the field or in the club, doing that in a detailed way where...
you talk about this, that happened in this performance on this day, is still not really done, and it is hard to do that. It involves me filming musicians performing.

In any event, I was interested in the relationship between the recordings that I had studied previously and the performance, and how these two things relate to each other. I particularly had the idea that recordings are conventionally seen as things that capture or preserve performances: a performance happens, you record it, and then you can listen to that recording of the performance. But in dance music, also in hip-hop, you have recordings which are the things that people are performing with, and of course it is improvisational performance, so every performance is different. How does that play out, that tension between something that is fixed and something that is changing in the real time of performance?

Both projects were interdisciplinary, in that they involved close attention to the musical sound and field research. This started as early as my graduate training, when I was pursuing my PhD and I studied ethnomusicology in addition to music theory. Those two fields are often at odds, and don’t talk to each other very much, but for me, thinking about how they could relate to each other was actually very productive. So, in that work, there is the music theory side of me doing close analysis of recordings, and also bringing ideas from music theory, and asking how we could understand this music better using these ideas. But also, conversely, how can this music stretch, challenge, or expand music theorists’ ideas about music, because it turns out that a lot of things that music theorists said applied to “music”, that is to say, music between 1750 and 1900 in Western Europe. So, partly looking at different repertoires reveals some of the gaps in their apparatus or ways of studying or talking about music.

**Sound studies and the materialistic approach to ontology**

This also brings in ideas from other disciplines, such as philosophy, ontology of music, and sound studies. When I researched and wrote *Playing with Something that Runs*—over a fairly long time, I started about 2005 and it was published in 2014—, sound studies was, at the time I wrote it, developing as a discipline. Jonathan Sterne’s seminal book, *The Audible Past*, was published in 2003, and you can take it as one of the books that says, “Hello, here is sound studies”. Partly, what I am saying is that sound studies was actually emerging when I wrote the book and when I started writing, but I didn’t think that I was going to write a sound studies book, I thought, “I am going to write a book about the relationship between performance and recording”, and as I was writing it, and more of these ideas were exposed to me, I thought, “this is a sound studies book”. Like a lot of other works in “sound studies,” it concerns itself with historical and cultural aspects of recording technologies, and it is similar in terms of the questions it asks. However, *Playing with Something that Runs* looks specifically at performance, and this is novel for sound studies, in which performances and performance more generally have not been addressed so much.

I had been interested in this question for a long time. It started with very basic things, like remixes. In dance music, even in more pop dance music, you might have five versions of a particular track, and it is not always clear which one is the definitive one, or that there is any definitive one. That already opens up a question of ontology: for a
long time, musicologists have been obsessed with figuring out what the definitive version of something is. I have been asked if ordinary people talk about ontology of music, or think about ontology. Well, certainly the producers that I talk to don’t say, “let’s have a discussion about ontology”, but they use ontological terms very thoroughly. When they make a track, they are concerned that it is recognizable as their track, as that track, and that means it has musical identity, and that is ontology. So, what is this piece, what marks it that it is that piece? And then, of course, more broadly, I am trying to develop a methodology of ontology that gets at both multiplicity and change, or the fluid nature of music within this style; multiplicity meaning, in this case, that you have all these different versions of things, and that you also have a lot of different kinds of components that go into things—loops, samples. Those are short things that make up recordings, but they can come from other recordings, and even that is an ontological question, or issue, I guess I should say. If you take a sample from another track and put it in this track and it is recognizable, it brings some aspect of the identity into the new track, and it is almost like a boiled down marker of the previous track’s ontology, but then you have to ask yourself: what is this new hybrid thing? I wanted to deal with those kinds of multiple constructs that exist within electronic dance music, and also the way that it can change over time. The most basic, provocative example being that you have the recording from the studio that then gets mixed with all these other recordings from studios to make this bigger thing, which is a DJ set.

Work, text, performance

So, I came up with a three-part formulation for talking about the ontology of EDM performance. The three categories are: work, text, and performance. Work means any kind of constructs that can have aspects of musical identity ascribed to it, where we can feel that there is musical identity attached to that element. When I say “work”, I am very specifically trying to deconstruct the idea of the conventional work concept—I think we should talk about that separately [laughs]. I just want to say that I am not using “work” in a classical sense, but rather as an ontological element. Then I am using “text” particularly to mean something that is inscribed into a material form. The most obvious example is a vinyl record, but of course any recording is a text, a score is a text—but that is not relevant to this context—, a digital file is a text, because even though you don’t see it, there is an inscription in there, in your storage, so that refers to the material dimension of it. And then, “performance” is the performance, the actual event, open in time, which unfolds with respect to other people.

First of all, I use “work” and “text” distinctly, because I think it is important to recognize materiality, but still to preserve some element of the fact that people do talk about musical identity in this style, and it is an interesting component of the style. Some people might be prone to making a move along the lines of “well, this music is so all over the place in terms of all the different versions that ontology is irrelevant”, but it has ontology! It is just a very complex, interesting, and particular approach to ontology. So that is why I am still using the term “work”, as imperfect as it may be. So, the idea is that these three are interrelated, and they are constantly shifting in relation to each other. In the chapter on improvisation—which is chapter three—I give two analyses: one is a DJ set, and the other is a laptop set. The basic approach is to take either a recording, or a set of recordings, and analyse them individually, see what their
The track that you asked me about was “The Bells”, by Jeff Mills. Jeff Mills is the most famous techno producer in the world, certainly one of the most famous. He is from Detroit but is very active in Europe as well. He is known for a hard, minimal style of techno, as well as being a very virtuosic DJ. “The Bells” is most likely his most famous track: fans will recognize it and be excited about it. I looked at the track individually, and some of the things I found about the track itself is first of all similar to some other Jeff Mills tracks: it really acts as a kind of DJ tool. Unity is not an obvious thing, nor does it seem to be the foremost concern in the track, let’s put it that way, because here, the track is sort of divided into two parts. In the first half, you have a signature motive, which is three pitches, and it sounds kind of like bells, so that is the sound that people will interpret as giving its identity to the track, that is what makes it “The Bells”. It is just a short, two-beat-long loop, actually. That is the dominant presence in the first half of the track. In the middle of the track, the bass line slowly fades in, and then the bell sound goes out, and you don’t really hear it for most of the second half of the track, so it is kind of curious if you look at it as a recorded object. If you were just to listen to it and not know that you were listening to one continuous recording, you might think it is actually two recordings that are sort of mixed. And yet, it is very strong as a track that people recognize. If you just look on the Internet for performances of Jeff Mills playing this, you’ll see that as soon as he plays the first sounds of it people start shouting “Bells! The Bells!”, and I found that they would whistle or sing the bell motive well before it actually came in, and when it comes in, it is like this moment of climactic arrival, like “We have the track!”. The question of coherence is sort of problematized in the track, if you will, and yet it is extremely recognizable. Then I looked at how he performed it in the context of a specific DJ set, which is called “The Purpose Maker mix” (2004), as well as in one other, rather interesting performance, that I will talk about in a moment. I chose it in that case because “The Purpose Maker mix” was recorded in a studio setting, so you can see what he is doing quite clearly, which is not typical in a club setting, or in most commercially produced DVDs of DJ performances. So, when I looked at it, I analysed a 10-minute segment of the performance, but the most detailed discussion is about the part that contains “The Bells”. He’s playing another track, and he gradually mixes “The Bells” in. One of the first things that I did methodologically was to just ask myself, “what part of the recording does this performance correspond to?” I tried to make a basic mapping of the performance. When I did that, I found that, at one point, the track jumped from its middle back to the beginning, instantaneously. Of course, I thought, “How does this happen?” [laughs]. Knowing a little bit about DJ techniques and scrutinizing the recording very closely, it became apparent that what he was actually doing was performing with two different copies of “The Bells”. It is a common DJ technique, but he is doing it very virtuosically, because it happens super fast. What that means, especially in ontological terms, is that you get the part of the track that features the bell motive, which builds up to its falling point, and that’s when he brings it back to the beginning, so you get more of the bell motive. He does not play very much of the second part of the track—the part that I said does not fit in, it does not seem to fit in as well with the first half. What you get, then, is that he consolidates the identity of the record in the performance through his DJ technique. He brings the motive that identifies the track, he makes it a lot more
present, it takes up a whole lot more of the track, he minimizes the part that’s less distinctive, but the irony of that—or, perhaps, certainly something that is interesting about it—is that he does that through disruption. It is by disrupting the surface, or structure, of the original recording, and jumping all around within it, that he creates more unity.

Just as a side note, there’s a briefer discussion on that chapter, of an orchestration of this track, which should have particular interest to the French, because it is performed by the Montpellier National Orchestra, it was done at the Pont du Gard bridge and is a performance of Jeff Mills’ tracks. Jeff Mills was there and was performing with a drum machine, while the orchestra essentially played arrangements of his tracks, and there was a live audience. The event was facilitated through an interaction between the orchestra and Tresor, a record label with which Jeff Mills is strongly affiliated. Anyway, when “The Bells” was played in this performance, the problem of unity had to be dealt with again—and it was dealt with in a much more classical, conventional way. First of all, the piece was given a very clear key, you could say it was in A, but it only has three clear pitches, so it is not a conventional tonal piece. We have to understand that this involved the work of an arranger, because that is clearly of a person who took the recording and made it into something a symphony orchestra could play. The arranger put it into A minor, it is clearly A minor: it has an introduction, it has a concluding section, and the part with the bass line that was the second half of the track that did not fit so well. They turned that into an interlude, so it is a short, self-contained part of the track, with some brass instruments riffing on the bass line, and then it goes back to “The Bells”. And you have the bells again, and again, they are presented very much as a distinctive feature of the track. They are played by actual bells. They throw in a few classical techniques such as augmentation, where the bells are doubled, the rhythm, and so on. But my basic point is that they take a fairly conventional approach to make it unified, whereas Jeff Mills’ approach is thoroughly steeped in DJ practice.

The work as “assemblage”

In conventional, canonical musicology, ontology is framed as relating to the idea of the “work” concept, particularly with the development of the canon in the 19th century, where for each composition it is understood that there is a singular, definitive “work” behind it. Lydia Goehr talks about the way we conceptualize this as if it were a sculpture, having almost that level of permanence. In Gracyk’s work—Gracyk’s a philosopher—, he’s dealing with ontology in rock. I agree with the basic project, which is to say that recordings are central to rock and that this configures ontology differently than how we have thought about it in a method based on written texts. However, I think that, still, people talking about the “work” have a tendency to try to find a definitive work, a single definitive work. In classical music we can understand the score as the exemplar of the work, and in rock, the recording is the work. The reason I make a distinction and say “that’s not quite right”, is that people talk about the track, the song, whatever word they use, in a way that still abstracts it. In this case, they are abstracting it from the recording, rather than from a score, but they’re still making a move toward abstraction. These philosophers of rock ontology are right, in that we need to think about ontology, and especially we need to think about the particularities and materialities that arise from the recording process, as well as the
particular way the recording was actually created. But we’re not dealing with a definitive version. We cannot necessarily say, “that is the recording”. Sometimes you can in dance music, but if you look at it as an overall practice, that’s not how it works. Instead, I like to look at ontological constructs, ontological elements, or sometimes I just refer to it as either “musical entities” or “elements of musical identity”, which are meant to be even more neutral terms than “work”. The idea that a sample or a loop can have identity—the very short bell motive clearly has identity; that does not mean that every short motive has identity, but that particular one does—, then you can understand these as somehow ontological. Looking at larger and larger levels, the sequence of the multi-measure pattern could potentially have identity, but not necessarily. Then you get to a complete track, and you have things like the different versions of the track, or the different versions across time. Ultimately, you get to things like a DJ set, which you can understand as a kind of meta-work, it is composed of all these works, but then the identity of these works is sort of loose-end, or unbuttoned, if you will, and stitched together into something larger. I have used words, following Georgina Born, Philip Bohlman, and some other authors, who do not always realize or emphasize that they are using similar terms—network, constellation, assemblage—to describe the multiplicity of ontology. They are not talking about electronic dance music, but Born especially is talking about ontology in contemporary recorded styles, where we can understand it as inherently multiple and also changing across time.

**Affordance**

Gibson was an ecological psychologist, and he was primarily interested in visual perception (1979), but he wrote about, or theorized, how we come to understand the world, and argued that we come to understand it through interacting with the surfaces of the world, for instance. Interacting directly with our world is how we actually come to understand things. I guess there is a philosophical dimension to this, too. He would not say that you have a cognitive model of, say, a chair, and then when you see a chair, you check it against the template in your brain and say, “oh yes, that’s a chair, now I can sit in it”, but rather you try sitting in things and you discover that chairs are really good for sitting. Maybe some other things are not so good for sitting, and you want to change them a little bit so that they are, and voilà, you have a chair! It is easy to think about that with babies, the way they are constantly exploring the world, putting things in their mouths that don’t really fit in their mouths to see if they go in their mouths. In a way, they are figuring out the world, they are figuring out the affordances of the world. Gibson would put it in evolutionary terms, in that we are trying to figure out what elements of our environments are given, unchanging, and what elements are changing, because we need to pay attention to the ones that are changing: that is what we have to respond to, whereas we can take the ones that are unchanging more as given, and free up our mental space to deal with the other stuff. Affordance can be understood as what kind of interactions does a substance or an object allow, suggest, or invite, as well as what it does not allow, suggest or invite. It is easiest to understand in terms of physical objects, or surfaces, but you can extend the concept to almost anything—I suppose you could expand the concept even to people, or situations. Gibson was thinking of it visually, and you can understand it in terms of how you interact with surfaces and come to perceive the world. This is related to what is called embodied cognition. It moves away from a computational theory of mind, where we are
understood to have concepts, as if our brain is a computer and we check them against our senses, but rather that our body is directly integrated with our perception of the world.

Now, regarding electronic dance music. I like the term “affordance”, in particular, because it emphasizes how people—in this case, musicians—interact with devices. Typically, in a lot of writing about dance music—and here I am including some journalistic writing as well as some scholarly writing—there is a very history-of-invention kind of approach. Histories of music technology would say “dance music started with the theremin, and these are electronic instruments, and then there was the Moog synthesizer, and then there was this, and then there was this...” It emphasizes people—who are most typically men—inventing some particular gadget, and that “changed” music. I am trying to get away from that kind of thinking. This is part of what is often described as “technological determinism”, although that is more specific than what I just mentioned. The idea is that something is created and it has a certain purpose or certain properties that determine its use. In music history, if you were to take a deterministic approach, you would say something like: “the material of the strings of the piano changed, so we have lower and more resonant bass sounds on the piano, and that changed the kind of music people are writing”. Not to say that this is totally irrelevant, but you don't want to be in that sort of fixed approach. Gibson's idea of affordance allows you to talk about things in terms of how you are going to use them, in terms of what they allow. There is also the idea of surface, and I apply that to the idea of interface. Rather than talking about this technology, sampler, sequencer, software, or controller, I look more generally at the idea of the surface. The interface is the surface; it is the interaction side. What does that afford? As Gibson was an ecological psychologist, there is also an ecological component in imagining an interface, as well as a musician's total setup with the different, various devices that they have, an ecology that you can move around, move through, in different paths that are somewhat open to different approaches to navigation.

I suppose it is important for people to have visual cues, particularly in club settings: the lights are helpful because they can't see that well, but musicians are really looking for fluency, for the ability to use these controllers and other interfaces with the same kind of fluency that people use traditional instruments. This often has to do with gesture-to-sound mapping: you do something with your hand, and the sonic result is perceptible and direct. You mentioned it as a sort of substitute for the haptic. I might put it almost as a shortcut to the haptic: in the context of performance, I think the haptic is primarily finding these knobs, or sliders, or other things—the record surface—with their hands, and that is what they need to get to, so to speak. Having a visual that guides the eye helps.

There are two other things I might mention. In software, such as Ableton Live, at least, the colour component is there, but somewhat secondary. It is a thing that musicians can use to help organize if they wish, but the colours are arbitrary—I have actually often been asked, “Is the bass drum blue?” Well, no [laughs], because anything can be a bass drum, for one thing. The musicians pick what colour they are going to use. Having a range of colours can be helpful, but some musicians more or less disregard it, and others really like to organize their sonic components by colour. Similarly, with Robert Henke's controller—the Monodeck, that he was using in the 2000s—the lights correspond to whether a clip is on or off, so that it gives direct feedback on the formal
configuration happening at that moment, but again, the colour is, to a certain extent, arbitrary. The other thing I was going to say is that there is of course a visual display component for the audience in this. It makes the music look more “techy” and visually impressive. This is also a more general issue, given the acousmatic element, in that when you see somebody perform with recorded music, particularly electronic music, the question of the sound and where it is coming from is always problematized, so your eye needs something to attach to. There are various ways of compensating for that, a lot of it being that these interfaces themselves have very forward-direct gestures, and the audience can see the musicians doing something and getting a sonic result. Even if the audience cannot technically say what that electronic manipulation was, they can hear that the sound changed noticeably. It is because the musician did that [turning knob gesture]. There is also the musician’s body, which they can attach visual and other kinds of sensory significance to. To a somewhat lesser extent, there are visual components, that is also why you have lightshows, as well as VJs, because when you are dancing, your eyes are sort of unfocused, and what are you going to look at, if you’re looking at something and not closing your eyes? It is hybrid, it is meant to seek a middle ground between technological determinism and voluntarism, the idea that the technology is completely socially constructed. Gibson’s approach is also suited well for that. He talks about the substance of the thing as what it essentially is—I am not quoting that precisely. The physical properties of something are still there, even if we have not discovered their affordances, or chosen to interact with them. Understanding them as affordances gives us agency to interact with them, and not simply to do what they tell us to do, as it were. My approach is meant to be in between those two approaches.

Toward a “critical” organology?

I spoke about this at your conference in Rennes on Thursday, and yesterday at Ircam, this is newer work for me, and newer ideas of thinking about materiality in music theory. Well, I was doing that before, but now I am trying to really build it up as a concept. When I talk about the idea that instruments can be embodiments of music theory, for instance, I was engaging with the work of Alexander Rehding, and his idea of “instruments of music theory”. He is using instruments in two senses: instruments as devices, of course, but also more broadly as tools, or things that do something. The structure of an instrument, first of all, reveals music theoretic ideas. The piano is the simplest example, I won’t get too technical, but the white keys are the diatonic scale, and the black keys are the pentatonic scale. The diatonic scale is not unique to Western music, it is a particular way of distributing seven pitch classes among twelve possible pitch classes within an equal-tempered system. If you try to get into the maths, you will find out that it is an ideally configured kind of construction. It is not an accident that keyboards have had this particular shape for centuries and centuries. Yes, it is also nice for your fingers, but it is not arbitrary, it is not just for the technique, it also has a theoretical dimension to it. Also, Rehding is working more at the level of knowledge production—and of course I am interested in that—but I am more taking a practice-based approach. The kind of instrument that one chooses to talk about definitely also has the potential to influence the kind of theory results you get. If we were to ban pianos in music theory classrooms and conservatories, and force everyone to use guitars for their part writing, part-writing rules would be different very fast. The piano
is an ideal instrument of music theory, because of this component of the diatonic scale, whereas guitars afford a very different way of playing chords, and connecting them, for instance. Within dance music, one of the things you see is that instruments, or interfaces, are consistently constructed with channels. This reflects, of course, the history of recording and the development of multi-channel sound, but it does not mean that that is how the recording works. It actually means that it is musically constructed in channels, and that is music theory.

I mentioned earlier the idea of textural layers, and this absolutely has an instrumental configuration. Look at a Roland TR-808 drum machine: it has this set of percussion sounds, and you build up layers using that, it is very simple. If you look at sequencing software—of course, again, that has a whole relationship to the history of recording practice—, that’s layered. In *Unlocking the Groove*, I develop what I call a textural graph, which is essentially a kind of bar graph of the texture of a composition. It is very similar—distinct in some way, but quite similar visually—to a piano roll notation that you would see in sequencing software. All that favours a particular approach to layers. Music theorists, when they talk about meter, almost always talk about it as constructed in layers, or levels, they talk about it as hierarchical in various ways. That said, sometimes what counts as a textural layer to the ear is not always an exact correspondence to what was a layer in the production method, but very often it is.

I have not been using the term organology *per se*, I am not saying “I am an organologist”. It is interesting that there is this response in France, which maybe speaks to the tradition of that in France, but what I am trying to do in *Playing with Something That Runs*, and a little bit in *Unlocking the Groove*, is to find ways of understanding the categories of things people make music with, which are both physical things and software things. Certainly, I suppose you can understand that as an intervention into organology. I suppose the conservative dimension comes from the taxonomic impulse, Foucault’s idea of the order of things. Figuring out how the world is ordered and sort of mapping that might even have a colonial dimension to it. That’s getting out of my area of expertise, so maybe we should not go there... You talked about the museum idea and the object, there’s got to be something related to that. This is actually making me go back to ontology, because Lydia Goehr’s book is called *The Imaginary Museum of Musical Works*. There is this idea that things are preserved and put into a canon. There is the idea of “here we have these things that are on display”. I think it correlates to what I was saying earlier about the accounts of technology where you say “here is this object, here is that object”, on and on and on, while I think it is more valuable to emphasize the way people interact with objects. This is very evident with electronic music. The number of objects, in practice, is going to be infinite, people are constantly making new objects. So, the idea that we can create some museum that comprehensively represents all of the musical instruments or most of them, has become inherently ridiculous [laughs].

Just with studying dance music, even with *Playing with Something That Runs*, when I was getting copyright permissions for some of the photos of interfaces, the companies were saying, “Why do you want this photo? We are on the third edition of that now”, and I had to say, “well, that is the one I studied five years ago, you know!” It is constantly changing at such a rate now. There is definitely a new critical organology. In the US, I think of people like Emily Dolan and John Tresch (2013). Bringing sound studies and the history of science, or history and philosophy of science into discussion with each other,
often draws on theories of scientific instruments, and looks at how it can say something about musical instruments. But this tries to get away from the taxonomic impulse; it tries to look at how this plays into kinds of cultural constructions, knowledge production, but also how you can understand the cultural mapping of an object.

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**VIDEOGRAPHY**


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