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volume, filled with Derrida-like wordplay. The question under consideration is 'do animals get earworms?'. Impossible to tell, but we can observe strangely compulsive behaviour that is isomorphic with an earworm, or at least so the thinking goes. Yet there is an unresolved internal tension in presenting this as a chapter in a book, which might be why one can find the author delivering it as a paper on YouTube at an unconventional conference in 2016. Reference is made to a beetle walking in circles for minutes on end, a kind of kinetic earworm. In the live delivery, a video of this beetle is projected to the speaker's left, along with some other visual counterpoints (unfortunately, the screen is only partly visible in this particular video). Simply reproducing the text removes a charming bit of context, character and personality, but it also flattens Priest's charismatic and reserved delivery. Of course, the visual of sitting at a table reading a paper with a projection to the side leaves something to be desired as well. I hope to see continued experimentation with this material – perhaps eventually some kind of theory-film.

Eldritch Priest is an interesting individual, composing chamber music, producing records as a jazz guitarist, working with The Occulture and having now written two books. I wonder, though if there isn't a meeting point between all these various modalities. Defined forms seem to pose unproductive problems for him, so is there something between a free-jazz album and a book – something both and neither but completely its own thing?

Alex Huddleston

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Julia Eckhardt, *Éliane Radigue: Intermediary Spaces*, Umland Editions, 211pp. €20.

I first encountered the very special music of Éliane Radigue (1932) more or less in reverse. Around 2011, I heard Charles Curtis' recording of *Naldjorlak*, and a live performance of harpist Rhodri Davies performing *Occam I*. These are instrumental works from a composer famous for her electronic output. Over the subsequent decade I heard several more live performances of pieces from the *Occam ocean* series, and heard stories from musicians who had visited Radigue in Paris to learn them. I heard a few works for the ARP synthesiser from the 80s, and *L'Île re-sonante* from 2000.

But it has only been in the last year or so that I've been able to listen to her feedback-based tape pieces from the late 60s now that these recordings have been digitised and made more widely available. In 2019, Julia Eckhardt's volume on Radigue, *Intermediary Spaces*, was published, comprising a long interview, Radigue's 2008 essay 'The Mysterious Power of the Infinitesimal' and a list of works and discography. In reading it, a complete picture of Radigue finally swims into view. Thus, despite knowing it for over a decade, it's only been in the last year that I've been able to fully grasp the nature of her music, its singularity and consistency, and the magnitude of her achievement.

For me, it has been understanding her approach to feedback, and the nature of her early work, that has been revelatory. It holds the key to the way she thinks about musical construction, the way she listens and (arguably) the way she works with instrumentalists. In particular, it's crucial to understand the distinction between *larsen*, and 'feedback', used as an English loanword in French.

Larsen is used to describe the more conventional feedback between microphone and speaker cabinet. But when Radigue refers to 'feedback', she generally means not *larsen* but 'einjection' feedback – the process by which a tape loop, containing some initial base sound, is fed between two tape machines. 'This continuous process results in a very dangerous effect for the tape recorders if they aren't scrupulously controlled with the mixing console,' she says (p. 88).

> Gradually, I established my initial vocabulary, developing a particular way of formulating these electronic sounds. I felt myself to be in the time of the Arcadian shepherds and Greek philosophers discovering the laws of natural acoustics and developing the principles to which we owe so many wonders in Western music. I felt the same question of what other musical foundations could be, in regard to this new language (p. 89).

Radigue's first tape compositions – *Jouet Électronique* (1967), *Elemental I*, *Accroméga* (1968), *Usral*, *Stress Osaka*, *Omnht*, *Vice-Versa etc.*, *Opus 17* (1969) – were all constructed from loops of tape treated in this way, mixed together in intricately planned formal schemes.[1] In these early compositions she established the working parameters that determined the rest of her compositional life. A piece would begin in her mind with an idea or an image. The piece's form would be worked out. Its materials would be

[1] Many of these works have been released through the Éliane Radigue bandcamp site, hosted by Ina GRM. The recordings have extensive notes provided by Emmanuel Holterbach, https://elianeradigue.bandcamp.com/ (accessed 20 September 2022).

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generated – using 'offline' methods. (Radigue does not regard herself an improviser.)

Radigue's compositional method requires careful manipulation of materials that could, if left unchecked, run away into chaos. As Radigue writes in the essay that opens the volume: 'So much richness in all this "feedback" and other chance or provoked "interference". Such a challenge to keep them under control while maintaining the correct distance, the tiny adjustment that makes them develop until a terrible "fit" [*colère*] causes them to self-destruct' (p. 12). (Radigue is hearing-impaired in one ear, meaning that her listening experience has re-oriented to compensate – possibly leading to her increased and intense attention to tiny changes in high partials.)

Such an attitude towards material also affected Radigue's practice in performance. Speaker cabinets would often be positioned pointing towards walls – allowing sound to reach the audience's ears indirectly, through reflection. Radigue would often remain apart from the performance space, in an adjacent room, or even a cupboard. Pieces would be performed sometimes once only. In all cases, the result is to distance the sound from its hearer, to both immerse the audience in sound and shroud it from direct view, as if the audience were experiencing the sound already fed back through itself.

One can contrast this attitude to her own work with that of her early mentors and colleagues Pierre Shaeffer and Pierre Henry. Both Pierres (as Radigue calls them) considered their works important opuses, to be considered part of a newly developing canon of musique concrète, which should be broadcast, heard and discussed widely. Their materials were presented to the audience in a construction which was witnessed directly. The intention was not immersion but communication.

The book includes a telling anecdote which illuminates the differences between Radigue and her circle of male colleagues and friends in Nice, including Claude Pascal and Yves Klein (p. 63):

> Late one evening, we were on the beach. There was a whole group who accompanied me for my night-time swim. It was 1954 and I was very pregnant. At the time, it was out of the question that a pregnant woman would go to the beach in the daytime, so we went at night and we began to 'glossolalise' on the beach. [Yves] Arman [Radigue's husband] maintained it was I who proposed we all do the same [vocal] sound, but I'm not sure. The only thing I remember having done is harmonising the voices according to their register. For non-musicians, the simplest thing to harmonise is the major chord. And Yves [Klein] said: 'Yes, that's it!' . . . It was like children playing with a ball and then one of them suddenly finds the ball interesting and puts it in his pocket. . . I didn't intend to make a symphony of it. Yves [Klein], on the other hand, was taken by it.

It became Klein's *Symphonie Monoton-Silence*.

It was not Radigue's style to propose and execute a work with such basic materials and dimensions. But for Klein, here was an opportunity to stamp his presence on the world – to make a statement of sufficient directness and audaciousness as to attract the attention he desired. Radigue's work rewards attention but it does not demand it. It does not come to you; you have to come to it.

It is ultimately this phenomenon – that of her collaborators 'coming to' her work – that has enabled the remarkable series of instrumental works over the last two decades. She has not gone out to unfamiliar musicians with instructions and scores. Rather, musicians who know her way of working with electronics have made the pilgrimage to her Paris atelier. In such circumstances, her imaginatively generous yet retiring way of working makes sense. Why make scores for publication to be read by just anybody, when one is making works for specific individuals? Why not transmit the composition orally, with private explanatory notes and drawings as required? (Since 2011, the *Occam ocean* series has grown to encompass 69 works, for individual soloists, duos, trios and groups of up to seven players or more.)

In a sense, the *Occam ocean* series comprises a mirror image of her feedback works: Radigue is engaged in secluded, offline activity, working closely with the material of musical production – in this case acoustic instrumentalists. She provides a certain amount of initial material, as one would with a tape loop fed between two machines, and the instrumentalist's playing analogously feeds back on to itself, as the experience of performing using (typically) only a single mental image is continuously deepened.

It can sometimes seem like Radigue's compositional activity underwent a fundamental break as she departed from electronic composition – after all, her change of compositional priorities coincided with the advent of digital technology. (Despite putting in much effort in the 90s to figure out how best to use digital technology, she remains an 'analogue' composer.) Yet what *Intermediary Spaces* provides is proof of just how unbroken Radigue's compositional mindset has been. She has applied similar types of musical thinking across multiple arenas, from feedback-derived fixed tape works, to open-

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duration tape installations, to tape works using the ARP synthesiser, to works for acoustic instrumentalists. A single ocean of vibration, being cultivated and guided at a distance, allowing it to feed back on to itself, generating an infinite play of resonance.

'The freedom to be immersed in the ambivalence of continuous modulation... The freedom to let yourself be overwhelmed, submerged in a continuous sound flow, where perceptual acuity is heightened through the discovery of a slight beating, there in the background, pulsations, breath. The freedom of a development beyond temporality in which the instant is limitless' (p. 16). For anyone interested in Radigue's work, the history of electronic music and the situation of instrumental music in the present day, this book is essential.

Lawrence Dunn

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Mine Doğantan-Dack (ed.), *Rethinking the Musical Instrument*, Cambridge Scholars Publishing, 465pp. £67.99.

Performance Studies has been accepted as a musicological discipline in the last 30 years or so, but there is a much older tradition of instrumental research: history and evolution, fabric and mechanics, and that interface between composers, players (often the same person) and makers. The editor of this volume, Mine Doğantan-Dack, however, tells us that 'there is still little scholarly work... on the artistic affordances of different acoustic, electronic and digital instruments, their critical reception in cultural contexts, the nature of the embodied interactions they generate in composing and performing music, and the expressive and communicative meanings that emerge as a result of such interactions' (p. xvii). These 18 chapters, originating in the Music and Sonic Art Conferences held at the Institut für Musikwissenschaft und Musikinformatik in Karlsruhe between 2015 and 2019, try to address these areas in a volume that 'proceeds from acoustical to digital instruments, and from critical/philosophical enquiry and historical considerations to artistic research projects' (p. xviii). For *TEMPO* readers, two thirds of this book will be of interest, including two excellent chapters dealing with truly innovative work on traditional instruments, the cello and clarinet respectively, a valuable overview of Hugh Davies' work and chapters looking at different aspects of digital applications.

Cellist Ellen Fallowfield's work will already be familiar to readers of this journal.[1] Her practically focused chapter is a refreshingly jargon-free introduction to 'extended technique', with an historical overview of multiphonic research for all instruments, before moving specifically to cello multiphonics. She gives a useful list of instrumental manuals and web resources from 1921 to 2020, 60 or so in all, with only the odd omission (for example, Matt Barbier, trombone 2016[2] and Sarah Watts, bass clarinet 2015[3]). Detailed work is in *TEMPO*, on her site Cello Map[4] and the CelloMapp app on the Apple App Store.

Scott McLaughlin's approach in the 'The Material Clarinet' (part of an Arts and Humanities Research Council project, The Garden of Forking Paths[5]) is to explore areas that most players spend their lives practising to avoid, 'the indeterminacy of the clarinet: the unpredictable phenomena found across the strata and seams of clarinet sound-production' (p. 70). He moves away from 'normal' playing towards allowing the player and the instrument 'in-the-moment to determine possible paths... sonic forms hidden in resonant-material potentialities' (p. 71). McLaughlin pushes the instrument and the player's unique 'technique', seen 'as a physical system in an embodied instrument-player assemblage' (p. 72), by exploring all the multiphonic and harmonic possibilities. But what I like here is his view that these are not 'extended techniques', noises grafted on to traditional technique, but something quite different, 'that bring[s] everyone – the player, the instrument, the listener, and the composer – further inside the instrument, stripping away layers of imposed musical abstractions' (p. 74). He describes in detail the acoustics, harmonics, venting, under- and overblowing and multiphonics but with something much richer and more nuanced in mind than tired modernist tricks in the relationship of the player to a traditional acoustic instrument that has much to offer in what he calls the 'moment of invention'.

James Mooney gives us an excellent chapter on Hugh Davies and looks at the little documented area of new instruments (mostly electronic, invented in the twentieth century), but

[1] *TEMPO*, 74, no. 291, January 2020.
[2] https://mattiebarbier.com/resources/faceresectiontextfinal.pdf (accessed 25 May 2022).
[3] www.sarahkwatts.co.uk/home/index.html (accessed 25 May 2022).
[4] https://cellomap.com (accessed 25 May 2022).
[5] https://forkingpaths.leeds.ac.uk (accessed 25 May 2022).

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