

FLORIAN HECKER CHIMERIZA- TIONS

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Chimeric Sensing by Stefan Helmreich

What is a chimera? *Chimera* has become an increasingly common term in contemporary biology, where it refers to an organism that is made up of cells or tissues from genetically distinct lineages. Chimeric laboratory animals, which may feature biomatter from different species—mice that host human breast cancer genes, for example—are only the most famous instances of such entities. Whether created through the fusion of embryos, through grafting, or via mutation, chimeras mix biological elements that are not usually conjoined in a single creature. In this way, they concretize in a scientifically describable creature, the Chimera, as imagined in ancient Greek mythology—a fire-breathing monster with the head of a lioness, the body of a she-goat (itself sometimes sporting a goaty head), and the tail of a serpent (Roes, 21).

But biological chimeras are not only the result of recent molecular biotechnological enterprise and of cross-species tissue-culture laboratory science. Evolutionary biologist Lynn Margulis, before her death in 2011, had been urging the claim that almost every living thing on Earth has been and is still a chimera. We animals and plants are all of us organisms made out of other organisms. Margulis was seeking here to extend her well-known theory of *symbiogenesis*, the argument that evolutionary biological novelty emerges not just from Darwinian descent with modification, but also through the symbiotic fusion of different sorts of cells and organisms (Margulis, 1991). The mitochondria in our cells were once free-living, oxygen-respiring bacteria. The chloroplasts in plants were once independent cyanobacteria. As Margulis and her colleagues put it in their 2011 book, *Chimeras and Consciousness*, “We merge chromosomes and chemistries within species, bodies, and minds. ... Chimeras are real. Life is not shy” (4).

Turning attention to *life*—as a chimeric process, as a gathering and compounding of creatures into new assemblages—can jump-start our thinking about the *auditory chimerism* with which Florian Hecker has lately been experimenting. Hecker’s chimeric compositions are attempts to decompose common sense about sound, hearing, and listening. Simply explained, auditory chimeras are sound events realized through a technical practice of sieving one sound through another—pressing the “fine structure” (the second-to-second pitch and texture) of one sound (say, a drum) through the “envelope” (overall attack, sustain, and decay profile) of another (say, a piano). What results is a sonic chimera (in my parenthetical example, of a drum sound that has something of the feel of a piano). This chimera delivers a kind of structured nonsense meant to force listeners to confront their assumptions about how and what they are hearing when they hear. One might make an analogy to the writing trick known as the *ambigram*, in which words are forced into a conformation that permits the reading of two things at once, as with this rendition of “light is a particle”/“light is a wave”:



Hofstadter, 30

Here, “particle” is the fine structure, and “wave,” the envelope—though one could make the argument that it goes the other way, too, indicating the complexity of figure/ground distinctions in chimeras, about which more below (and compare with Albert Bregman on figure and ground in auditory scene analysis).

But, for now, back to biology: In the last few years, Lynn Margulis was exploring a new player in symbiogenesis, not mitochondria or chloroplasts, but a swimming, cork-screw-shaped bacterium called a *spirochete*. She suggested that the tiny hairs on the edges of cells, the filaments in mitotic cell division, and the tails of sperm all came from earlier organismic incorporations of spirochetes.

Margulis was also developing the idea that the human *senses*, which operate using cilia, may themselves be chimeric compounds of once-free living organisms, now yoked together in our animal bodies and harnessed to enable sensory apprehension. Vision, smell, touch, and hearing apparatuses are all composed in part of cilia, which Margulis maintained all derive from a symbiotically incorporated spirochete-like critter. On this model, hearing, as a biologically enabled capacity, is chimeric.

How, then, shall we think of bio-chimerical human hearing next to the technical process of making auditory chimeras? What happens when chimeric listening meets chimeric composition?

In his various works using chimerization, Hecker asks auditors to consider the new sound that emerges when different sound qualities are pressed into juxtaposition. He draws from the work of Zachary Smith, Bertrand Delgutte, and Andrew J. Oxenham, who, in their study “Chimaeric Sounds Reveal Dichotomies in Auditory Perception,” describe an algorithm that can create audio artifacts that have “the envelope of one sound and the fine structure of another” (87). Now, I will confess that the first example that came to my mind when I initially heard about this kind of thing was the talking guitar in Peter Dinklage’s “Do You Feel Like We Do,” from his 1976 PolyGram album, *Frampton Comes Alive!* In that piece, an electric guitar output was fed through a plastic tube, which was then fed (yikes!) into Frampton’s mouth, which, when he sang, gave the guitar something like the sound envelope of a human voice (one reason the apparatus was called a “talkbox”). The result was that the guitar sounded as though it were speaking, or articulating words: syrupy, sensitive macho-man words delivered with the come-on swagger of a 1970s rock star.

In a more highbrow register, what is at issue here is *timbre*—the quality of sound described in 1960 by the American Standards Association as “that attribute of auditory sensation in terms of which a listener can judge two sounds similarly presented and having the same loudness and pitch as being dissimilar” (45). Clarinets and pianos, for example, have different timbres: the same note will have a different feel on each instrument. But what *is* timbre, really?

One famous attempt to pin it down came in 1971, in the pages of *Stereophile* magazine, in which editor and audiophile J. Gordon Holt offered a taxonomy of hi-fi sound, a chart in which he keyed adjectives to frequencies. Thus, the range between 20 and 40 Hz—the zone of organ pedals and bass drums—he described as “thunderous” and “shuddery,” while the range between 160 and 320 Hz, the home of harp, cellos, and guitars, was “wooden”; and the space between 1280 and 2560 Hz, the domain of violins and trumpets, was “tinny,” “nasal,” and “brassy.”¹ What is notable here is the way that this taxonomy depends upon mixed metaphors, on often-untethered, free associations. In this way, *timbre is itself chimeric*. It is a compound effect—to do with

1 Thanks to Kieran Downes for drawing my attention to this chart.

the production of sound—as well as a compound *affect*—relating to our feelings about it. Chimeric hearing, meet chimeric sound.

These are phenomena that, to be sure, have met before. Back in 1857, Hermann von Helmholtz suggested that the ear itself assembled disparate data into new hybrids, writing that the ear “analyzes the interdigitation of the [sound] waves” (58), and thereby acts as a kind of frequency analyzer. We might think of the banks of cilia in many animal ears as detectors of sound’s fine structure, from which perceptions of sound envelopes are then crafted. Biological chimerism becomes a kind of anchor for chimeric listening and, thereby, an embodied tool—and one that can sometimes be misled (and also retrained) when particularly jarring auditory chimeras are presented to the ear.

So, let me go out on a limb and propose this: If biological chimerism is one of the supports of “life,” and auditory chimerism is one of the supports of “timbre,” both life and timbre are revealed as abstractions that emerge from chimerism. Both life and timbre are chimeric.

Answering the question “What is life?” may thus be akin to asking, “What is timbre?” (Sethares). Both yield answers that, at their most hand-wavy, define their object by what it is *not* (not inanimate or dead, not loudness or pitch²) and, at their more reflexive, point us to life/timbre as an effect of how people model or inhabit, say, vitality or hearing as such.

Dorion Sagan, Lynn Margulis’s son and frequent co-author, has argued that because consciousness is a *subjective* phenomenon, our theories of it—and perhaps of life—must derive from experience. And so it seems to be with timbre. What Florian and Dorion each underscore, then, is the fleeting and compoundly *experiential* character of vitality and sensing.

But as Hecker’s pieces help us to discern, *experience* is far from an obvious, unmediated phenomenon. What might an auditory experience be, after all, of Hecker’s music? What can one learn from the texture of that experience? How, to take a specific example, might we (whomever that is, since we are all chimeras and there are many of us—and more than a few of us are deaf) think anew about timbre through listening to Hecker’s sounds? One thing that pieces such as Hecker’s “Hinge” do, I would suggest, is poke at the wholeness often associated with timbre, a wholeness that is usually the result of stepping back and regarding a chimeric whole as, in fact, a whole (as a student of mine remarked when I asked him to describe the timbre of a heavily treated but smooth and glassy Neil Young guitar solo: “Man, that guitar sounds so *real*, so *natural*”). As the speakers in Hecker’s “Hinge” recite Reza Negarestani’s “Nature, its man and his goat (Enigmata of natural and cultural chimeras),” their voices are fed through a chimerization algorithm that Hecker uses to fracture any kind of humanist understanding of voice—and indeed any humanist model of hearing. The chimerization recipe that “Hinge” adapts from Smith et al., 2002, describes hearing as artificially reproducible by multiple Fourier analysis—that is, by the decomposition of sound waves—which might be accomplished via the technology of lots and lots of band-pass filters. And if hearing can be put together artificially, it can certainly be put together in ways that go against the grain of everyday experience, as “Hinge” does.

2 Bregman and McAdams write that, “Timbre tends to be the psychoacoustician’s multidimensional waste-basket category for everything that cannot be labeled pitch or loudness, including short-term spectral changes such as onset transients, long-term spectra, those dynamic qualities which a musician would term ‘texture,’ and so on.” (34)

There's an intriguing connection here to the limits of hearing, and to the world of the hard-of-hearing, since Hecker's chimerizations, playing as they do with the slicing up of sound waves, generate sounds reminiscent of those highly granular reconstructions of sound generated by cochlear implants (Blume, Chorost). Comparing the sound of cochlear implant simulations at various frequency resolutions³ with the sound of Hecker's "Hinge" reveals remarkable similarities. It also points to the often-occluded history of disability—and of utopian projects of deafness amelioration—in the history of the invention of sound technology, from the work of Alexander Graham Bell to that of Norbert Wiener, both famously interested in helping people overcome hardness-of-hearing (Mills). The technology that produces chimeras can thus direct our attention back to the historicity and, indeed, artificiality of experience. As Donna Haraway once wrote of the cybernetic human condition, "We are all chimeras, theorized and fabricated hybrids of machine and organism; in short, we are cyborgs" (150).

There is a poststructuralist devil in these details, too, for "hinge" is a word that Jacques Derrida uses in *Of Grammatology* to press the reader toward the possibility of holding two contradictory concepts in mind at the same time. Derrida quotes a letter written by Roger Laporte in 1965 to motivate his use of the notion of hinge to name this idea of the or/and:

You have, I suppose, dreamt of finding a single word for designating difference and articulation. I have perhaps located it by chance in Robert[']s Dictionary] if I play on the word, or rather indicate its double meaning. This word is *brisure* [joint, break] "—broken, cracked part. Cf. breach, crack, fracture, fault, split, fragment [brèche, cassure, fracture, faille, fente, fragment.]—Hinged articulation of two parts of wood- or metal-work. The hinge, the *brisure* [folding-joint] of a shutter. Cf. joint."—Roger Laporte (Derrida 65).

Hecker's "Hinge" means to point to sounds in which fine structure and envelope contradict one another and yet are co-present.⁴

Chimerized (cyborgian?) pieces such as "Hinge" are thus fundamentally composed through decomposition. And one of the key musical/sonic features being decomposed is *timbre*. Precisely what the American Standards Association suggested, you might recall, was "that attribute of auditory sensation in terms of which a listener can *judge*" (emphasis added). The judgment that permits us to understand timbre is being taken apart, atomized into a collection of abstracted, formal processes. There remains, of course, the question of whether and how Hecker's atomization can succeed; having blasted the coherence of sonic unity through decomposition, one might wonder whether what Hecker presents can fully escape from being recaptured into stable perception. Listeners, after all, might listen to, with, or through his compositions (to append a fleet

³ Listen here: <http://www.hei.org/research/shannon/simulations/>

⁴ Mathematician and philosopher Gilles Châtelet also employs the notion of the *hinge*: "We will hunt out the hingeing point at which principles become unstable, we will seek out the constructed symmetrizing devices and reveal the less expected dissymmetry that orients a more radical project" (10). Reza Negarestani reports that this was one point of departure for the figure of the hinge; as he commented to Hecker in an e-mail, "fortunately the reference was not to Derrida!" (in Negarestani e-mail to Hecker, forwarded to me on 22 November 2012).

of prepositions to listening in ways that Hillel Schwartz suggests might be useful), adding them up to new experience.

I hasten to add that this would not then reveal or recapture timbre as a holistic property of sound—much less a natural one. Electrical and computer engineer Kailash Patil and his colleagues, in a 2012 article entitled "Music in Our Ears: The Biological Bases of Musical Timbre Perception," in *PLOS: Computational Biology*, make just this claim, that timbre is a property of sound that humans are biologically tuned to judge. They locate this capacity in the auditory cortex, tunneling their analysis away from the cilia in the ear, into the head—or, more accurately, into the heads of ferrets, laboratory animals they use as surrogates for humans. Their results are not sonic, but visual: close-up maps of ferret neurons that are activated by particular frequencies (these look like heat maps, with activated neurons rendered in red and quiescent ones in light green). Patil and company describe these maps as "representations" of timbre in the ferret brain; for these researchers, judging whether ferrets recognize timbres consists not in asking these animals whether they had heard a piano or vibraphone, but in looking to see if the same neurons are activated for the same sound. This turns (ferret) "judgment" into something seated in the brain, rather than in an unfolding set of encounters. Curiously, the judgment of timbre is naturalized through becoming cyborg, through fusing information and flesh, through becoming a chimera. Perhaps this is no surprise. As Jonathan Sterne has observed: "Everything that is known about hearing in its natural state is a result of the interactions between ears and sound technologies. ... To get to hearing-in-itself, twentieth-century researchers first had to pass through media" (19, 54). Timbre can only be technologically described in the way Patil and company do it by recomposing it through decomposition, and then forgetting that one has done that.

This is not what Hecker is doing. He is not making timbre whole again. He is decomposing it otherwise.

This is not decomposition as Friedrich Engels understood it in his notes and fragments for his unfinished 1883 book, *Dialectics of Nature*, in which he wrote, "[D]ecomposition in dead organic bodies ... necessarily produces products that are more and more dead" (389). Hecker's "Hinge" and its kin are not dead. Neither, however, is Hecker's decomposition akin to the sense forwarded by artist Jae Rhim Lee in describing her "Infinity Mushroom Burial Suit," "a fitted body suit embroidered with thread that has been inoculated with mushroom mycelium," which "facilitates the decomposition of the body, the remediation of industrial toxins and viruses in the body, and new plant growth" (2007). Lee gives us decomposition as generative of more life. Hecker's is, rather, a chimeric decomposition, a remaking of audio to create novel sonic parts, parts that can reorganize sense and sensing, to in turn perhaps create chimeras in a more technological, artifactual sense.⁵ They create—to return to the biotech chimeras with which this essay opened—a genre of listening as biotechnology, a reengineering of the life of sound.

⁵ Jonathan Sterne might describe Hecker's work using a neologism he has proposed—"decompositionism ... where all sound and noise is potentially useful and possible to organize" (126). Thanks to Nick Seaver for thinking with me on this point.

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