The following essay is a speculative fiction piece introducing a fictional theory that I have termed echo-logical acoustemology — contracted as echoustemology — as well as various fictional characters who have dedicated their time to investigating this theory. In my introduction to this fictional theory, I have drawn on both real and fictional musicological, philosophical, and scientific scholarly work. The final result will be published as a webpage hosting several speculative fiction essays on the subject. I will also make recordings and invent notebooks to accompany the fictional archives and 'findings' of these characters.

# An Introduction to Echo-logical Acoustemology<sup>1</sup>

### by Adam Zuckerman

This paper serves as an introduction to a forthcoming, multi-volume publication that collects and surveys recently surfaced work in a field provisionally termed echo-logical acouste-mology — or echoustemology, for short.<sup>2</sup> My purpose here is to provide an overview and to contextualize the findings in advance of this publication, the first volume of which is due to arrive late next year. These volumes will contain several essays and are organized around the myriad archives — recordings, notebooks, photographs, etc. — of the individuals whose work it collects.

Briefly stated, echoustemology names the various practices investigating the theory that sound as material vibration never fully dissipates from the world but remains vibrating indefinitely in an ever-continuous state of transformation and reconfiguration. Following Eco. D, I consider echoustemology to be most closely related to the field of acoustemology, though echoustemology's earliest conception predates the latter by several centuries. Acoustemology was first developed by Steven Feld in the 1990s and has yielded several important insights into the

<sup>&</sup>lt;sup>1</sup> Submitted to the annual conference held by The American Musicological Society and subsequently transcribed and edited for publication. Since the echoustemologists under discussion here are anonymous (a fact which I discuss in the pages that follow), I have devised the following system of reference: Echoustemologist is shortened to 'Eco.' — for Eco. A, referring to one individual, Eco. B to another, Eco. C, and so on. When referring to a notebook in this collection, I provide the above shorthand followed by the notebook number, as in: Eco. A, Notebook 1.

<sup>&</sup>lt;sup>2</sup> My usage of this term derives from excerpts found in Eco. A, Notebook 3, pg. 18, wherein the author refers to their work as 'echology,' and Eco. D, Notebook 1, pg. 63-81, wherein the author writes of their work's relation to acoustemology. Others have used the term 'sonic archaeology' to describe this work; however, for my part, echo-logical acoustemology most appropriately threads all of the various practices and encompasses their theoretical basis. I have then adopted the contraction echoustemology for convenience. Selections from the above-mentioned notebooks will appear in the first volume of the forthcoming publication.

relational ontology of sound and into acoustic cohabitation.<sup>3</sup> Feld's classic example is of the entanglement of the Bosavi people of Papua New Guinea with the birds in their environment: birds and their vocalizations, to paraphrase Feld, are experienced by the Bosavi people not merely as the behavior of a totalized and insular 'other' species; rather, as an extension of their sonifying space and time, birds are experienced simultaneously as presences and absences — an interplay named by the word *mama*, meaning both 'reflections' and 'reverberations.' Reflections and reverberations, in turn, are what humans become in death.<sup>4</sup> Similarly, echoustemology embraces a conception of the acoustical object as a relational nexus entangling the temporal and spatial dimensions of vibrations and the physical embodiments through which they pass. Like the Bosavi people and their birds, human and non-human subjects simultaneously signify for echoustemology a presence and an absence through their sounding reflections and reverberations — not in the sense that one becomes the other; but rather, "one speaks through the other." Furthermore, this entanglement is constantly proliferating outwards in all directions, creating new relations between the echoustemologist and the many, often surprising physical embodiments with which they come into contact in their research. The result is something of a sonic cartography, where

<sup>&</sup>lt;sup>3</sup> For a succinct explication of acoustemology, see: Steven Feld, "Acoustemology," in *Keywords in Sound*, ed. David Novak & Matt Sakakeeny, (Durham: Duke University Press, 2015), 12-21. Feld developed the term acoustemology, which contracts "acoustics" and "epistemology", to describe a way of knowing and being through the audible. Echo-logical acoustemology is the adapted term to describe the particular focus on echo and reverberation.

<sup>&</sup>lt;sup>4</sup> Steven Feld, "Hearing Heat: An Anthropocene Acoustemology," L4E/E4A co-sponsored EL&G webinars, McGill University, filmed September 14, 2022, video of lecture, 1:04:33, https://www.youtube.com/watch?v=VDmceTUipPY

<sup>&</sup>lt;sup>5</sup> Eco. D, Notebook 4, pg. 71.

spatial and temporal lines connect things in the world that otherwise appear to have little relation to one another.

Whereas acoustemology has become a mainstay of musicological and sonic research, echoustemology remains largely unknown. There are several reasons for its persistent obscurity: foremost among them is that the scientific theory at its core remains unverifiable, a fact for which a not altogether ill-suited suspicion of pseudo-science has adhered; this suspicion is compounded by its historical relation to the traditions of alchemy and mysticism as well as to the ethical controversies which follow from its theory — and, more to the point, its practice. Nor does echoustemology neatly conform to familiar academic categories: the echoustemological project makes claims that seem to intervene in the natural sciences as well as in sociological, anthropological, zoological, and archeological, in addition to musicological and sonic research. These more or less formal interventions arrive on the heels of the frequently narrow and personally motivated aims of the individual projects undertaken, making a systematic synthesis of their implications for science doubly difficult.

The often intensely personal motivations behind its individual projects has the additional effect of lending the whole of echoustemology the appearance of so many disparate artistic practices. This appearance is not entirely shallow, however, and perhaps it is even best to begin an approach to echoustemology on artistic terms. In a discussion on the function of art, Ernst Fischer writes in *The Necessity of Art* that the individual strives through art

<sup>&</sup>lt;sup>6</sup> I refer to the dubious practice of clandestine recording or, put bluntly, of surveillance. Several echoustemologists find themselves covertly recording the personal lives of others and making claims about the (ultimately unverifiable) subliminal content of these recordings — and therefore also about the persons featured in these recordings, sometimes with scandalous consequences.

towards a fulness of life of which individuality with all its limitations cheats him, towards a more comprehensible, a more just world, a world that *makes sense*. He rebels against having to consume himself within the confines of his own life, within the transient, chance limits of his own personality. He wants to refer to something that is more than 'I', something outside himself and yet essential to himself.<sup>7</sup>

The echoustemologist likewise desires and strives towards a more expansive identification with the world, one that extends beyond the limited confines of individual existence and yet is found precisely in the individual's innermost depths. Through the echoustemological theory of vibrational resonance, the echoustemologist is able to establish and pursue a profound relationship between things in the world as well as between the echoustemologist themself and these things, at once deepening the internal connections that bind all things and externalizing these connections as objective, material fact. Moreover, one quickly sees that, like all great artistic genres and endeavors, echoustemology attempts in its own way to resolve the contradictions at the heart of the human experience in response to the social conditions of its day. 9 Just as, for instance, the novel emerged as a response to the gradual subsumption of social life under the market by opening up new vistas within the self-conscious subjectivity of the individual, so too does echoustemology attempt to transcend the limitations of individual existence in order to reintegrate the human condition within a universal framework. To the prevailing conditions of contemporary society — the ever-increasing atomization of individual life, the relentless severing of the individual from its social and natural environments, the commodification and popular obsession with data-driven information at the expense of experiential knowledge — to these echoustemology mounts a substantial, if perhaps desperate, response.

<sup>&</sup>lt;sup>7</sup> Ernst Fischer, *The Necessity of Art*, rev. ed. (London and New York: Verso, 2010), 16-17.

<sup>8</sup> Ibid., 54-58.

Yet echoustemology is also a scientific claim, and a systematic study of its implications has much to offer scientific fields of research. As I am not a scientist, I can only hope to motivate further research with the work presented here and in publications to come. I would only add that it is exclusively on this scientific basis — and almost never an overtly artistic one — that the echoustemologists take up their work. We should not, therefore, simply sweep aside its scientific aspect; for it is through its attempt to synthesize art and science that it is able to transcend the confines of an otherwise strictly scientific or artistic framework: and it is indeed by looking at echoustemology precisely through this synthesis that we are able to see that it not only strives to answer the everlasting questions of existence, but also that, through these strivings themselves, echoustemology already projects a high-fidelity reflection of the human experience.

Nevertheless, it is symptomatic of echoustemology's heretofore obscurity that it has yet to find its place in the institutions of learning, and one will not be surprised to find this reflected in the unorganized condition of its research. The individuals who take up echoustemology — several academics in related fields of research, to be sure, but a significant number of non-academics — all arrived to it through unique avenues and pursued their idiosyncratic research in a state of relative isolation. That their work remains virtually unknown is no less a consequence of the fact that what does come to light is always partial and fragmented, always anonymous, and always (at least apparently) posthumous. The work presented here is no different, but the scope of material recently unearthed is unlike what we have seen before. The story of how I came into possession of this work is largely of anecdotal interest; let it suffice for now to say that a large collection of material, the convergence of which appears more accidental than deliberate, was given to an acquaintance of mine, who one day, rather unexpectedly and without the least hint or

note of explanation, left it in my care. I began to sift through the material, slowly at first and not knowing the least of what it was I held before me (and I must add parenthetically that these materials — vast amounts of notes, journals, photographs, and archival recordings, enough to overwhelm a small room — were in a great state of disorganization). As the contours of the various projects took shape, it gradually became clear that the materials came from at least seven individuals, though perhaps as many as nine. Their lives and personalities remain obscure, accessible only through the fragmented materials left behind. However, I will have to leave this thread here to be picked up on another occasion. We turn now to a proper introduction to the theory of echoustemology and its history.

### The Theory of Echoustemology

'What is echoustemology?' The answer to this question has a rich history of development throughout which its formulation was increasingly refined. As stated previously, the theory of echoustemology asserts that sound as material vibration never fully dissipates from the world but remains vibrating indefinitely, indeed potentially infinitely — reflecting, dispersing, disassembling, and reconfiguring in a continuous, transformational process of becoming. The material through which sounds are transmitted and registered at any given moment are not the sounds themselves but their momentary, temporary embodiment; sound vibration underlies them, so to speak, not as an unchanging, transcendent object but as that change itself. Accordingly, what is heard as a new sound is, rather, a newly configured sounding that contains, just as it masks, the vibrational echoes of past sounding configurations.

<sup>&</sup>lt;sup>9</sup> This process is not unlike the processes of transformation through which H2O, for example, cycles through liquid, solid, and gaseous states.

Echoustemological theory begins with the understanding that the sense of hearing is physically framed by the auditory apparatus in such a way that what we hear is always relative to this apparatus; sound, on the other hand, always precedes and exceeds the framing of any particular apparatus. Consider, as an example, the human sense of hearing: human hearing is limited to a certain decibel and frequency range outside of which sounds are either registered by some body part other than the ears or are not registered at all. A sound with a frequency of 40,000 Hz is imperceptible to the human ear, but it is still audible to other ears — a dog's, for example. This is true not only with regards to frequency range but also to decibel range and distance: just as the dog can hear a sound higher in frequency, it can also hear a sound lower in decibels and farther away. The dog can therefore register a particular sound both before and after a human can.

The differences in perceptibility determined by each species' hearing apparatus suggests that we cannot with our own human ears objectively discern the full life-cycle of a sound in its emergence from silence to its decay into silence. Many questions follow from this — and it is these questions that stimulated the research of early echoustemologists: when precisely does the sound come into being, and when does it disappear? Temporal questions are paralleled by spatial questions: from where does the sound come into being and to where does the sound ultimately arrive? To all of these questions the answer is ultimately undefined; hypothetically, however, the answer is never, because a fine enough hearing apparatus should be able to trace the sound into

its furthest recesses of becoming and unbecoming in time and space.<sup>10</sup> Echoustemology pushes this logic to its limit, positing a world of ceaseless sound that for humans exists imperceptibly but that nevertheless exists. This domain is itself ever-changing and of unending dimensions, composed of variegated streams of vibrations that connect and assemble, configure and reconfigure, congeal into empirical acoustic phenomena and dissolve back into the vibrational flow.

Echoustemology claims to gain some access to this virtual plane through the actual, particular sounds that emerge from it. Sounds that are otherwise imperceptible to human ears are able to be captured using very fine microphones and are subsequently rendered humanly audible. This all being the case — and it is upon this basis that echoustemology hinges — the ability to uncover these vibrations, to trace them through their gradual, ever-continuous transformation between sounding configurations, and finally to establish through shared vibrational resonance the otherwise hidden connection between particular sounding configurations becomes an actual, if still ultimately unverifiable, possibility. The echoustemological project attempts to explore the implications of this possibility.

#### The History of the Theory of Echoustemology

To more fully understand echoustemology we must look beyond its contemporary formulations and follow the twists and turns of its historical development. The limited scope of this

<sup>&</sup>lt;sup>10</sup> There are still disputes among the echoustemologists as to how this works. The dominant opinion is that the global behavior of sound parallels its lower-level behaviors: they still undergo a process of decay over the course of time (but on a geological scale), such that a sound which is farther into the past, just as with a sound that is farther away, will still be quieter — and will continue to become quieter and to fragment, until, presumably, it reaches a point beyond recognizability. The identification and recuperation of these fragments and the attempt to piece them together is central to many echoustemological projects, particularly for echoustemologists A, B, D, and F.

presentation compels me to gloss over many of its rich details, yet I shall try to make an intelligible sketch of it here. The notion that sound vibrations remain vibrating indefinitely had been around long before it came to be scientifically theorized. Initial inspiration for the idea likely came from early Orphic poetry.<sup>11</sup> Its main conceptual precursor, however, can more readily be gleaned from various Roman-era Platonists who attempted to synthesize the Platonic ideals with certain fragments of the pre-Socratic philosophers, most notably Pythagoras's *Musica Universalis*.<sup>12</sup> From there it is carried through the alchemical traditions, where it is often discussed within the context of the nature of transmutation.<sup>13</sup> Though they rarely attempted to move beyond mere poetic hypothesizing (one can imagine the difficulty that the intangibility of sound must have made for experimentation without more advanced tools), there is no doubt that it is through the writings of the alchemists — and the elaboration of their doctrines concerning primal

<sup>&</sup>lt;sup>11</sup> In addition to Orpheus's ability to transfix the animated world with song, some followers (notably the Orphic rites practiced by a community in the island of Samos) believed in Orpheus's ability to animate the inanimate world with sound. This, in turn, led to speculation about the mystical nature of resonance — and whether this ability to animate the inanimate was in fact due to shared resonance between present and past, where the vibrations of a sound here and now resonate with those of a prior sound.

<sup>&</sup>lt;sup>12</sup> Other pre-Socratic philosophers of note here are Heraclitus and the preeminent atomist philosopher, Democritus. The fragments referenced here are collected across several later manuscripts, the most relevant of which is *Codex Diusunos*. Though their authorship is highly disputed, some have attributed them to Nigidius Figulus. These proto-echoustemological claims seem to have been the object, at least in part, of a refutation by Epicurus in his *Essay on Atoms*. Lucretius also seems to have made arguments against the idea, but several excerpts from *De Rerum Natura* nevertheless served as inspiration for later echoustemologists.

<sup>&</sup>lt;sup>13</sup> There are numerous examples dating back to Maria Prophetess's 'Seed of Unity.' A later example comes from Athanasius Kircher's *Musurgia Universalis*, where he attempts to elaborate a conceptual model that could produce — and thus also reproduce — all possible sounds, heard and unheard.

matter, the affinity between substances, and transmutation — that the echoustemological idea was imbued with a powerful and invigorated force.

Newton's law of the conservation of mass offered the first solid, scientific basis upon which the theory could be formulated. If, according to Newton's law, matter can neither be created nor destroyed, the same could conceivably be true for sound vibration. 14 The advancements of modern science eventually complicated the accuracy of Newton's law, but whereas the nature of mass as understood by Newton was eventually supplanted by Einstein's principle of mass-energy equivalence, Einstein's new discovery in fact strengthened the conviction in support of the theory of the preservation of sound vibration. 15 Speculations centered primarily around the idea that the fractionally small conversions of matter-energy were in fact vibrational movements. In this way, almost parenthetically, developments in modern science yielded the shards of insight and evidence that, when pieced together, appeared to confirm a scientific basis upon which echoustemology could stand as theory. Here it is imperative to remind ourselves that the scientific evidence is wholly inconclusive and that experimentation is largely non-replicable. Nevertheless, the suggestion was strong enough to bolster those for whom the idea already held sway. It is not beyond all possibility that further scientific study with more advanced technology will confirm, at least in part, the validity of the echoustemological theory, nor can we state with confidence

<sup>&</sup>lt;sup>14</sup> Newton's law states, to paraphrase, that matter is neither created nor destroyed. Centuries later Carl Sagan would say, in his acclaimed show *Cosmos*, that we — that is, all life on earth — are made up of the same stuff as stars; the same, according to some echoustemologists, in a move that harkens back to the Pythagorean notion of 'Music of the Spheres,' holds true for sound: that we are also made of the same vibrations as those stars.

<sup>&</sup>lt;sup>15</sup> Modifications had to be made to account for quantum mechanics and special relativity, in which the law holds only approximately — and in nuclear reaction, in which the law does not hold at all.

that such confirmation is in any way forthcoming. The importance of the echoustemological project — of which I hope to have already convinced you — does not fall alongside the scientific proving or disproving of the theory upon which it is taken up.

In any case, echoustemological research steadily declined throughout the Age of Enlightenment, as advancements and increased specialization in the hard sciences pitted empiricism against the speculative and often mystical thinking of the alchemists. The reemergence of the echoustemological project in the twentieth and twenty-first centuries was due in large part to the advent of recording technology and subsequent innovations in sonic analysis. <sup>16</sup> No less important was the recuperation of alternative modes of thought not beholden to the rigidity of scientific empiricism, which occurred amidst a cultural shift away from a near-total privileging of the visual sense towards a newfound enthusiasm for the hearing sense. In contrast to seeing, hearing emphasized decentralized, relational categories of ontology and sociology, privileging notions of continuous 'becoming' over fixed 'being' and rejecting oppositions between subject and object, mind and matter, culture and nature. Of this philosophical work, one of the most pertinent to echoustemology comes from the philosopher of sound art Christoph Cox, who elaborated a concept of the sonic flux, which names "the notion of sound as an immemorial material flow to which human expressions contribute but that precedes and exceeds those expressions."<sup>17</sup> Drawing from the work of Deleuze and Guattari as well as from the object-oriented ontology of Manuel De-Landa (among others), Cox conceives of sound within the framework of a "realist and materialist

<sup>&</sup>lt;sup>16</sup> The most notable of these was the program ISOSOUND, which allowed one to meticulously isolate the finest details of a sound recording and comparatively analyze its resonance patterns and trajectories.

<sup>&</sup>lt;sup>17</sup> Christoph Cox, *Sonic Flux: Sound, Art, and Metaphysics*. (Chicago: The University of Chicago Press, 2018), 2.

metaphysics of immanence," for which all of nature and culture is conceived as "a collection of flows" and "the objects of empirical experience are the products of virtual structures and intensive processes that are immanent to matter but ordinarily hidden in its results." Sounds, according to Cox, are "not punctual or static objects but temporal, durational flows" that are the manifestation of virtual yet entirely real and thoroughly material tendencies, capacities, and thresholds that are immanent in nature itself. The affinity of these concepts to echoustemological theory lies, in particular, in the notion that sounds manifest a momentary emergence from a primordial domain of sound. Echoustemology offers a rich contribution to these philosophical discourses, and in the first volume of the forthcoming publication I have dedicated an entire essay to discussing echoustemology's relationship to the 'sonic flux' and other philosophical contributions of this kind. On the sonic flux' and other philosophical contributions of this kind.

## The Echoustemological Projects And Their Audio Files

As I have mentioned before, despite being unified by its core theory and concepts, the echoustemological project is typically taken up independently. Of course, inspiration and instruction is initially drawn from previous echoustemological work, but, in the absence of a coherent tradition, the material encountered by any one echoustemologist will have been quite different from that encountered by another. Some have ventured to suggest a diffuse, geographically dispersed network of echoustemologists. In my estimation this has been overstated, given that there

<sup>&</sup>lt;sup>18</sup> Ibid., 6.

<sup>&</sup>lt;sup>19</sup> Ibid., 3, 27-8, 34.

<sup>&</sup>lt;sup>20</sup> Also of note in this regard are the writings of philosopher and sound artist Salomé Voegelin. See, for example: Salomé Voegelin, *Listening to Noise and Silence*. (New York and London: The Continuum International Publishing Group, 2010).

is little evidence that collective research was undertaken. Be that as it may, amongst the echoustemologists under discussion here there is evidence of at least one correspondence that appears to have spanned several years.<sup>21</sup> Aside from this, despite the event of their work having found a common destination in my acquaintance and then in me, there is as yet no indication that this group worked together in a concerted fashion. As already mentioned — and this is especially true for those not otherwise working in academia — these echoustemologists pursued their projects in relative isolation.

The result of the echoustemologists' independent and solitary pursuits is that they each bring to their projects strikingly different approaches and at-times conflicting notions. This is reflected in the wide spectrum of motivations for their projects and in their overall scope — ranging wildly between scientific, social, inter-personal, and spiritual: Echoustemologist A at-tempted to discover all the sounds of the universe at once — what they called "the sound that is all sounds." Another, Echoustemologist D, worked in the opposite direction, attempting to uncover the source of sound vibration — what they called "the sound of sounds." Echoustemologist D, worked in the opposite direction attempting to uncover the source of sound vibration — what they called "the sound of sounds." Echoustemologist D, worked in the opposite direction attempting to uncover the source of sound vibration — what they called "the sound of sounds."

<sup>&</sup>lt;sup>21</sup> This correspondence — between Eco. B and Eco. F — is still being sorted and analyzed. I hope to include excerpts from them in future publications. Despite the present evidence against a further connection between these echoustemologists, the fact of this correspondence combined with the fact that their work all found its way to a single destination in my acquaintance seems to suggest that there might be a deeper connection after all — but more work needs to be done here.

<sup>&</sup>lt;sup>22</sup> Eco. A, Notebook 2. They pursued this goal in two ways: one, a layering of all (possible) sounds together; and two, searching for the end of the signal chain, so to speak, as a single, discrete sound. Tragic circumstances seems to have cut short this research.

<sup>&</sup>lt;sup>23</sup> Eco. D, Notebook 4. They also refer to a "cosmic scream."

gist C catalogued and meticulously attempted to disentangle all sounds past and present.<sup>24</sup> Echoustemologist F fixated on the final words of a loved one, obsessively seeking the resonances of these spoken vibrations through their long, deep history in the past and their endless unfolding in the present.<sup>25</sup> Echoustemologist B, with a somewhat convoluted view of the ethical essence of sound and vibration, attempts to prove the consistencies inherent in the "ethical character" of vibrations throughout its sounding reconfigurations.<sup>26</sup> Echoustemologist E held the conviction that all matter was of a purely vibrational essence, such that the appearance of solidity is, in reality, a microscopic vibrating porousness; this led Ech. E to view the body as nothing more than a vast accumulation of particular trajectories of sound vibrations which under particular conditions coalesce (at birth) for an indefinite duration (of life) before dispersing again (in death) — and so they attempted, through analysis of the vibrational makeup of bodies, to artificially construct a new body.<sup>27</sup> The fact that listening back to a sound recording necessitates its re-amplification

 $<sup>^{24}</sup>$  A project which was essentially an extension of Pierre Schaeffer's concept of L'objet Sonore with the requisite updates. The assumptions that guided this dissection of sound, for example definitions of what constituted a single sound, are often of greater interest than the conclusions of this echoustemologist.

<sup>&</sup>lt;sup>25</sup> Another project which ended tragically, though not before some very unexpected, indeed unspeakably moving, results.

<sup>&</sup>lt;sup>26</sup> This individual's work suffers from a somewhat muddled articulation and requires much work to coherently parse. Certain questions do seem to point the way: do the vibrations which configure in sinister sounds always reconfigure in other discernibly sinister sounds, and does this also apply for joyful sounds? Is every utterance of "I love you" (in whatever language) related to all other utterances not just through its phonetic qualities and linguistic lineages but through some shared vibrational matter? Is it possible to account sonically for the difference in 'character' between the whale's song and the military cruiser whose blaring drives the whale near extinction? The discrepancy between a particular sound's character and its underlying vibrations leads to some interesting conclusions.

<sup>&</sup>lt;sup>27</sup> A sonic 'Golem,' as it were. See in particular Eco. E, Notebook 5 for detailed schematics.

became the focus of echoustemologist G, who studied the implications of this 'doubling' of sound vibrations and its potential temporal distortions.<sup>28</sup>

Alongside the copious notes and journals of the echoustemologists are their accompanying recording archives, which contain a long list of files, numbering in the thousands, all of which will eventually be published.<sup>29</sup> They include, according to their labels, the following recordings: of various insects listening to the world; of amplified fish nerve tissue; of the heartbeat and neural networks of a cockroach; of the change in a bat's sound after the sound has bounced off of one surface and after several thousand surfaces; of the vibrating leaf of a plant after being struck by this same bat's sound; of miles-long electrical wiring: aboveground, subterranean, subaquatic; of the gradual breakdown of a former moon of Saturn into the dust that are its 'rings' as well as the traces of these vibrations; of the 'geological' treatment of sound, where one minute is expanded to a thousand years and vice versa; of the gradual erosion of a mountain into a stone into a grain of sand; of the electromagnetic runoff of orbiting satellites; of the 'chord' of tectonic plates; of the 'scales' of human vertebrae; of the scales of amphibians; of the fire of the earth's core in relation to the fire of the sun; of the mid-ocean whirlpool of microplastics; of the waves produced by the brain as it experiences different emotions; and of the traceable sonic history of the lower and higher partials of a meat processing plant.

<sup>&</sup>lt;sup>28</sup> These studies eventually led the researcher to obsessively accumulate recordings of their own listening to a single initial recording — and continuing to record each listening that followed. Another aspect of this project built off of Maryanne Amacher's investigation of the phenomenon that the ear produces its own sound in response to the sounds it hears.

<sup>&</sup>lt;sup>29</sup> Unfortunately, in addition to many missing files, there are some that are corrupted beyond repair.

I offer, in conclusion, a final consideration: I have not picked through these projects for publication on the basis of their apparent success or failure. Judging on this basis alone would sorely miss the point; for it is obvious that in some sense all of these projects must ultimately fall short of their projected aims. This is because, firstly, vibrations and their ever-continuous sounding manifestations always outlive the echoustemologist; and because, secondly, the path an echoustemologist follows — through particular decisions, determinations, and conclusions — rests, in the final analysis, on that echoustemologist's idiosyncratic and subjective inclinations. This is not to say, however, that the work of any individual echoustemologist ceases to be relevant or is otherwise concluded with individual's death: their work investigating the world of sound and vibration may be meticulously studied (as I have attempted), it may be built upon, and it may inspire and guide altogether new echoustemological projects. In this and in subsequent publications I hope to show in greater detail the insights that can be gleaned from echoustemology as an initial step to laying the foundation for its continued study.

<sup>&</sup>lt;sup>30</sup> For instance several projects are concerned with seeking out existential origins or destinations; these projects, which recall the attempts of bygone ages to prove the existence of God — are simply without end. These are perhaps the most obvious of examples to fall short of their goals. Others will demonstrate an incongruity derived from contradictory understandings and implementations of echoustemological theory.

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