The Working of Sonic Being in E-music

Gerry Stahl

gerry@gerrystahl.net https://gerrystahl.net

Martin Heidegger's exploration of how things are disclosed (his ontology, or philosophy of being) provides innovative ways of understanding many phenomena, including works of art. Although Heidegger did not write about music, he did discuss the working of other art forms, including painting, pottery and sculpture. To discuss the implications of Heidegger's philosophy for understanding the nature of music, we can consider his analyses of these different art forms and adapt them to music. This chapter will extend Heidegger's approach to art by applying it to the development of electronic music in the mid-twentieth century to elucidate both his philosophy and that intriguing movement in music.

Heidegger is concerned with the way things come into being, their forms of being, or how their being is worked out. The *being* of something centrally involves how it presents or discloses itself in its specific form of appearance. This chapter will explore the being of works of a certain genre of music, *e-music*—that is, how works of electronic music are structured to disclose worlds of sound in certain ways.

The term "e-music" is here coined to refer to a spirit of electronic music as it developed in the 1950s and 1960s (Dunn, 1992; Eimert, 1957). E-music grew out of the serial music of Schoenberg and others, and featured composers such as Varese, Stockhausen, Boulez and Xenakis. It had broad influences on classical, jazz, fusion, acid rock, rap, new-age trance and disco-dance music. Integral to e-music's compositional experimentation was the concomitant development of analog and digital technologies of sound production, including tape splicing, sound sampling, sequencers and synthesizers. We will consider e-music specifically as exemplified by paradigmatic works and reflections of Karl-Heinz Stockhausen (1962; 1972), which defined an approach to composition with striking parallels to Heidegger's philosophy.

We will view the being of works of e-music from the perspectives of four identifiable approaches by Heidegger to analyzing how works of art and other beings are disclosed:

(a) Available beings like tools are disclosed as *understood* within the nexus of beings that form one's world as one pursues human concerns. (Heidegger, 1927/1996)
(b) Works of art like paintings disclose by setting truth into work—i.e., disclosing a *world* created by the working of the artwork. (Heidegger, 1935/1964)
(c) Things like hand-crafted jugs are disclosed in accordance with their historic *epoch* of being, such as the antique, medieval, mechanical or digital era. (Heidegger, 1962/1972)
(d) Works like sculpture disclose relations of *form, space and time*—thereby creating material, moments and places for people to dwell. (Heidegger, 1969/1973)

We will explore how to apply each of these four ontological approaches to works of music through an investigation of e-music as it emerged in the 1960s. The following characteristics of e-music relate to Heidegger's philosophy:

(a) E-music illustrates how one hears already *understood* sounds versus noise.
(b) Works of e-music open sonic *worlds* in which novel aural phenomena are set into work.
(c) E-music is produced with innovative *technologies*—such as the use of digital synthesizers or computers to manipulate sound parameters—which are explored by e-music compositions.
(d) Works of e-music establish relations of *form, space and time* among sounds through the explicit, controlled composition of these dimensions.

While Heidegger offers a transformative way of viewing art, his conception of historical change is open to critique. In addition to illustrating the power of Heidegger's innovative insights, we will also note their limitations—primarily from the viewpoint of Marx's socio-historical philosophy, which Heidegger failed to appreciate (Habermas, 1992; Stahl, 1975):

(a) Heidegger's view of authentic man is ideological and individualistic, while his analysis of tools like e-music technologies downplays their ties to modes of production and consumption. (Adorno, 1964/1973)
(b) Heidegger's analysis of art ignores the complexity of the labor involved in making a film, a jug or a musical composition, and how that work is socially and historically mediated. (Benjamin, 1936/1969)
(c) Heidegger's account of history ignores its social structuration, whereby history is not just given, but is produced, reproduced and transformed by works, including works of music. (Bourdieu, 1972/1995; Giddens, 1984)
(d) Heidegger's characterization of sculpture imposes his conceptualizations of space and time, rather than developing them from how they are disclosed in the work of sculptors and composers. (Mitchell, 2010)

Heidegger sees the working of the work of art as the revelation of truth. Marxists see the production of art as creative labor mediated by technological means and social processes. Although neither Heidegger nor Marx explicitly considered music at length, analysis of the technology and history of e-music can provide increased understanding of the insights and the limitations of both philosophies. The following sections discuss e-music and other art forms from the perspectives of Heidegger's four successive approaches to the being of artworks, raising concerns about the adequacy of those views. Examples from the development of e-music—and related observations from painting, pottery and sculpture—are used to extend Heidegger's philosophy. These instances should render Heidegger's abstruse ontological theories more tangible and comprehensible, as well as suggest how aspects of the production process and socio-historical context should be incorporated in the origin of the being of works of art.

(a) Beings in the World

Heidegger's most important publication—which argued for the need to understand the being of beings in terms of how they are disclosed—was *Being and Time* (Heidegger, 1927/1996). Here he rejected the traditional view that people exist within an objective, value-free environment, surrounded by material objects upon which they impose meanings. In contrast, he proposed that human existence discloses a network of meaningful beings, whose significance is tentatively suggested from the start in terms of one's concerns, expectations and pre-judgments. The world around us is always already understood; Heidegger's analysis is a philosophy of just how the world is pre-interpreted—and how this understanding may subsequently be made explicit and further articulated (Stahl, 1975; 1993).

Heidegger illustrates the pre-understanding of the world in terms of how we hear sounds:

> Initially we never hear noises and complexes of sounds, but the creaking wagon, the motorcycle. We hear the column on the march, the north wind, the woodpecker tapping, the crackling fire. It requires a very artificial and complicated attitude in order to "hear" a "pure noise." (Heidegger, 1927/1996, S. 163/p. 153; see also Heidegger, 1935/1963, S. 15/p. 656)[1]

In perceiving a sound, we immediately understand it *as* something, as the sound of a certain object, instrument or process, or as a certain kind of sound.

This can be directly applied to how we hear music. We do not first or primarily hear music as uninterpreted raw sounds that we must then interpret. Rather we hear the bowing of a violin, the ringing of a bell, the strumming of a guitar. We hear the solemnity of a requiem, the joy of a jig or the romance of a love song. We may also hear the expressive communication of a performer or the emotional intention of a composer. According to Heidegger, these initial forms of being of the sounds are determined by our culture, by how "one" interprets them. Once something is initially disclosed in a certain way, we can develop our interpretation of it through explicitly building upon possibilities opened by how it was disclosed and pre-understood.

While Heidegger is focused on describing the experiential phenomena of pre-understanding, it is easy to see that there are social mechanisms at work there. For instance, pop music prejudices are systematically manufactured by a powerful culture industry, which produces, promotes, hypes and sells musical concerts and recordings (Adorno & Horkheimer, 1947/1972). More subtly, composers adopt mechanisms that contribute to pre-understanding. The system of Western classical tonality, which most music composers employ, is one example. Although music theory defines 12 tones to the octave, virtually every classical musical piece focuses on a subset of those 12 tones. For instance, a piece in the C Major scale primarily uses the 7 notes of the octave that are white keys on a piano. Different scales produce different pre-understandings of mood for listeners.

The alternative twelve-tone approach of serial composers like Schoenberg was an attempt to avoid the pre-understanding fostered by tonal composition. Schoenberg arranged all 12 tones of the octave in a series, and his serial pieces ran through their series before repeating any tone (Adorno, 1948/1973). That eliminated the suggestion of an emphasized key and removed corresponding prejudices about the piece for the audience. The audience then had to overcome the consequent feeling of disorientation and search for other interpretive features of the music. Although he sometimes rejected the tonality of traditional keys, Schoenberg retained the timbres of orchestral instruments and the emotionality of standard patterns of loudness (amplitude) and speed (tempo).

The pioneers of e-music extended Schoenberg's rejection of classical tonality to other parameters of sound in their compositions. Webern—still within the Schoenberg school—integrated loudness into the serialization process, emphasizing silence at one end of that parameter's scale. Silence was transformed from just an implicit rest to slow down notes, into an explicit (disclosed, hearable) composed element. Silence functioned as "negative space" between consecutive sounds.

---

[1] Citations of German publications list publication / translation year, with German / English pagination.

The vision of e-music was influenced by Edgar Varese and others who foresaw the possibility of composing with arbitrary timbres, not just the characteristic sounds of traditional physical instruments. The new science of acoustics and the developing technologies of electronic sound production suggested creating sounds with any desired characteristics. In theory, the sound of a note played on a piano, organ, guitar or violin—while quite complex—could be scientifically analyzed in terms of its pitch (frequency), timbre (overtones or waveform), and the attack, sustaining and decay of its loudness (amplitude envelope). Sounds could be produced and manipulated by electronic devices (oscillators, controllers, filters, modulators, etc.), creating radically new sonic material through the total organization of the sound parameters (Eimert, 1957). Subsequently, it was possible to define a sound digitally by specifying with a computer its amplitude at each of thousands of microseconds. These individually constructed sounds could then be combined into a sound composition by splicing tape recordings of fabricated and/or "found" (recorded) sounds, playing them sequentially on a synthesizer (Figure 1) or aggregating them with a sequencer.

Figure 1. A 1975 Moog synthesizer. Photo from (Wikipedia_contributors, 2021).

E-music eliminated many of the familiar aural clues that provided a pre-understanding to an audience. Historical developments in musical composition met resistance from changes in the audience of music. The reproduction of music through radio and records had created a huge audience for music. However, much of that audience did not have the cultural background to interpret and appreciate classical music, such as Schoenberg's serial music. To people who were not oriented to exploring the new potentials of sound production, works of e-music could sound like "just noise"—incomprehensible sounds (Neill, 2002). However, as discussed below, e-music opened up a world in which the nature of noise was itself disclosed as interpretable through a technological understanding of its being.

(b) The Working of the Work of Art

In an essay central to his middle period, Heidegger focused on the being of art. *The Origin of the Work of Art* (1935/1963; 1935/1964) proposes that an art work can disclose a world in which

people may encounter the being of tools. For instance, van Gogh's painting of a peasant woman's shoes (Figure 2) discloses the being of her shoes as embedded in the peasant's world:

> Van Gogh's painting is an opening-up of that which the tool, the pair of farmer's boots, in truth *is*. This being steps out into the unconcealment of its being…. There is a happening of truth at work in the work, if an opening-up of the being happens here in that which is and how it is. (Heidegger, 1935/1963, S. 25, my translation)

Figure 2. Van Gogh's painting *A Pair of Shoes*. Van Gogh Museum, Amsterdam. Photo by author.

Heidegger proposes that the oil painting of the shoes discloses the nature of the shoes as serviceable and reliable tools in the peasant's world. This represents a reversal of perspective from *Being and Time*, in which the being-there (*Da-Sein*) of the viewer discloses the painting within its relations in the viewer's and peasant's networks of tools and concerns. Here, being is disclosed by artworks as well as by human Dasein.

In *Being and Time*, "Dasein" is generally assumed to correspond to an individual's human existence. However, Dasein's openness is not necessarily a matter of cognition by an individual mind. Consider, for instance, an audience at a concert: Their group listening opens the music's world, as jointly understood by the collectivity. Then, the term "Dasein" refers to the shared being-there of the group at the musical event, an instance of being-there-with-others or group cognition (Stahl, 2006). So, the Dasein of *Being and Time* can involve the disclosure of a world to an individual person, a group working together, an audience of some event, a culture and/or even generic inauthentic common-sense understanding.

In Heidegger's consideration of art, the opening of being can take place through a work, such as a painting, jug, sculpture or poem. Such works disclose meaningful worlds. A tension (struggle) exists in these works between disclosing (world) and concealing (earth). For instance, by opening access to the world of the shoes, van Gogh's painting conceals its own earthy materiality as paint on canvas. Heidegger refers to this tension as a *Riss*, which in German means tearing apart, but also the design, outline or boundary. This boundary is particularly apparent in sculpture. A wood carving, for example, opens the space around and between the surfaces of the wooden forms that make up the sculpture's design, while the wood itself—with its internal structure, physical strength and materiality—lies hidden below the surface. As a bodily object, a

sculpture reveals one side at a time, concealing visual access to temporarily hidden planes, which are implicitly indicated as around the bend.

Heidegger argues that van Gogh's painting discloses the nature of the shoes. However, this analysis only works because the painting is representational. Heidegger misses the painting's deeper art-historical importance: the relationship to impressionist revelations about light and shadow, or van Gogh's own exploration of brushstroke as an element of the materiality of paint. The significance of van Gogh's paintings does not primarily have to do with how they disclose the lives of the people or the being of the tools represented in the worlds of the paintings. More important are his techniques of applying paint to the canvas, leading to the emergence of abstract art as exploration of the materials, geometry, light and texture of oil painting. By focusing on the painting's representational function, Heidegger misses much of its historical import.

The year after Heidegger's essay on art was written, the Marxist literary critic Walter Benjamin published *The Work of Art in the Age of Mechanical Reproduction* (1936/1969). This essay can be read as a (possibly intentional) response to Heidegger, who does not acknowledge the historic changes in art. Benjamin reflects on the essential transformation from painting to mechanically reproducible forms of imaging, such as lithography, professional photography, silent film and sound movies. One can easily extend this technological development forward with box cameras, Polaroid, Photoshop, iPhone selfies, Instagram, YouTube and TikTok.

Benjamin delves into what takes place in historic transitions due to reproducibility, such as the transformation from live theater to film. In a play on stage, the actors take on the roles of human characters and present them in a unique setting. By contrast, in the production of a movie, the actors are treated more like props, who adopt isolated poses, which are later edited together by a complex process involving many professionals and technical processes. The produced movie—having lost the "aura" of the unique occurrence—may then be seen by viewers anywhere and at any time. What once took the careful coordination of people (cast, audience, theater staff) coming together in space and time, can now be effortlessly reproduced anywhere. What formerly opened an innovative world is now constrained as a commodity for mass consumption.

Theodor Adorno, music critic and friend of Benjamin, extends the analysis to music and the "culture industry" (Adorno & Horkheimer, 1947/1972). He argues that commercial pop music and big-band jazz represent trends in music resulting from its popularization through mechanical reproduction in recordings, similar to that of film (Dunn, 1992). In earlier periods, people learned to play musical instruments and accordingly better understood what was involved in producing music, but records spread music to people with little understanding of music theory. Adorno discusses the dialectic of enlightenment, in which social progress toward increasing knowledge and morality has always been accompanied by regress. Benjamin's examples of mechanical reproduction of art works illustrate this: the increasing democratization, popularization and accessibility of art due to technological progress in means of production has been accompanied throughout history by regression in the innovation of popular works and the depth of understanding by the audience. While Adorno's dialectic of culture parallels Heidegger's abstract notion of the *Riss* as a conflict in art's impact, Adorno and his critical-social-theory colleagues such as Benjamin, Horkheimer, Marcuse and Habermas delve into the social and historical processes through which this tension occurs. The history of e-music illustrates the decline in the public's musical understanding in the following sections, as the ontological vision of e-music is gradually lost in the commercialism of pop music using electronic technologies.

(c) Art in the Age of Technology

In a late essay, Heidegger returned to the project of *Being and Time* with a discussion of *Time and Being* (1962/1972). Here, he maintains that the disclosure of being is given by successive "epochs of being" throughout history. For instance, things were disclosed as creations of God during medieval times and now they are given as material for, or products of, technological manipulation. This is Heidegger's approach to integrating history into his ontology. The question is whether this is an adequate comprehension of the role of history, particularly in the working of artworks.

According to Heidegger, works of art set truth into work as the disclosure of being, where being is always disclosed in accordance with the prevailing epoch of being. Consider how this applies to music. Works of music open worlds—acoustic landscapes of meaningful sound. When the music is self-consciously technological, such as Stockhausen's *Kontakte* (1962), the sonic world is opened and understood as a technological product, and the technical parameters may be made perceptible (heard as such). The nature of the sound is itself disclosed, rather than appearing as a presence of some other being (instrument, performer).

E-music provides a propitious example of technological being. E-music treats sound from a technological perspective (Figure 3): as technically defined in objective, measurable terms of frequency and amplitude and as material for production and manipulation by technological means (Manning, 2004; Puckette, 2007). Even individual notes can be composed out of sound parameters—generating new kinds of sounds. Works of e-music often evoke reflections on our technological age, such as images of space travel or video games. At the same time, they are frequently heard as noise—either the din of mechanical and technical contrivances or the incomprehensibility of strange sounds.

Figure 3. Karlheinz Stockhausen in the Electronic Music Studio of WDR, Cologne, in 1991. Photo by Kathinka Pasveer, retrieved from https://commons.wikimedia.org/w/index.php?curid=8385683.

Within a Heideggerian viewpoint, noise is sound that is not pre-understood: It makes no sense to the listener; it is not disclosed as meaningful (Stahl, 1976). The pioneers of e-music had to explain to the listening public what they were trying to do with sounds that seemed to *be* just

noise. Verbal descriptions of the aims and methods of e-music works supported understanding, helping the music to be disclosed in a way that would not be rejected as incomprehensible noise but could be interpreted within a context (world) of aural being (explorations of sound). Rigorous theoretical considerations by e-music composers abounded in the 1960s: Stockhausen's *Texte*, Xenakis' *Formalized Music*, Boulez' *Boulez on Music Today*, and articles in *Die Reihe* and *Perspectives of New Music*. In this way, the composers acted as ontologists, elucidating the hermeneutics of e-music. For Heidegger, ontology is simply the explication or radical interpretation of everyday understanding, which was particularly urgent for e-music, given the extent to which it rejected many of the traditional crutches of music appreciation.

The working of an e-music composition discloses something of the ontology of sound. In being crafted by a composer, performed by a musician, appreciated by a listener and analyzed by a critic, the work makes something of its sonic ontology visible to each of these audiences. They each articulate a different narrative of their interpretations, based on their concerns, expectations and pre-judgments. However, a successful work must connect these communities within the shared world opened by the e-music work.

Even *noise*—which is generally taken to be a rejection of understandability—can be interpreted through a technological approach to sound and its theory. E-music analyzed and worked with noise. In technical terms, "white" noise is a mixture of all frequencies of sound. It can, for instance, be digitally generated with a random-number generator specifying all frequencies stochastically. White noise can then be manipulated with filters and amplitude envelops to produce musically interesting noise sounds within selected pitch ranges. Controlled noise can be integrated into music to add depth, as rock musicians did with feedback from speakers and electronic distortion of their instruments, but now manipulated across the spectra of its technical parameters. As discussed below, the history of e-music provides a rich example of how the technological analysis of musical sound was applied to compositional control over sound, including noise. It illustrates how a work of music opens a world in which the historical being of sound is disclosed… and transformed.

The way in which a new understanding of noise arises through the composition of e-music suggests that Heidegger's analyses inadequately appreciate the role of the artist's productive labor that makes the work of art what it is. The artist does not merely bring forth a work whose being is given by history, but rather structures the details of the work's being through the artist's creative labor (working). This may point to a general problem with Heidegger's ontology. While providing a brilliant phenomenological description of how beings are disclosed, he does not describe how an individual being (whether thing, tool, work or Dasein) comes to be disclosed not only as the kind of being it is, but also as the unique being that it is. Even if one focuses on the artwork's being, it is necessary to analyze how that being becomes specified.

What is the relation of an artwork's working to the artist's historically situated work? Perhaps what Heidegger discusses as the *Riss* between earth and world in the being of van Gogh's painting was set into the artwork by van Gogh's artistic working with earth and world in creating the painting, as they interacted within the play of van Gogh's historical world. How is his painting's earth related to the artist's brushstroke style and how is the painting's world related to the life of contemporary farmers? How is the working of noise in e-music structured by the composer's work in creating the music?

In his essay on *The Thing*, Heidegger (1950/1967) considers the example of a jug to discuss in general how things are disclosed. He suggests that the being of the jug is centered on its interior void, which can be filled with water or wine and can offer it for pouring and imbibing. Heidegger seems to have in mind a hand-crafted ancient Greek jug, which functioned with the "aura" of a unique thing in the here and now—not an interchangeable jug from a factory assembly line in the technological era. However, he does not describe how an individual jug concretely comes to be what it is—with its unique character and aura as well as with its particular functional shape—through the potter's effort, rather than a factory's production.

Learning to make traditional pottery involves acquiring skills and knowledge to be able to produce jugs that can fulfill a well-functioning jug's tasks. Creating an aesthetically pleasing jug involves a series of many phases: acquiring and preparing the clay; gathering the tools and equipment; centering the lump of clay on the rotating potter's wheel; opening a void in the lump; pulling the sides up in several pulls without the sides collapsing; shaping the interior curve to match the exterior curve; partially drying the piece to give it strength; trimming the thrown piece and cutting a foot on it; gently shaping a spout that will pour without dripping; attaching a pulled length of clay for a handle that will fit a human grip and provide balanced lifting; slowly drying the clay without cracking; optionally etching design in the surface; firing the jug; glazing it and firing it again.

Each stage of producing the jug by hand is an exploratory experiment and the final product is always somewhat of a surprise. There is an interplay between one's aims and the results. At each successive stage, one is confronted by an object with its own character. The back and forth between the artist's strivings and the evolving work's response is typical of all forms of artistic production. An artist does not simply impose a pre-conceived template on some physical material (clay, wood, pigment, sound, etc.). There is an interplay between creator and created, between mind and eye (Merleau-Ponty, 1961/1964), between disclosing and concealing, between enlightenment and regress. This interplay during creation is then established in the work of art as its specific working or unique being.

In *The Origin of the Work of Art*, Heidegger writes about the connection of the work to its creator:

> Although the work of art becomes actual only in the carrying out of the creating, and thus depends upon this act for its reality, the nature of creating is thereby dependent upon the nature of the work…. From the perspective of the achieved outlining of the nature of the artwork—according to which, in the work the happening of truth is at work—we can characterize creating as a letting something emerge as something brought forth. The work's becoming a work is a way in which truth becomes and happens. (Heidegger, 1935/1963, S. 48f/p. 683f, my translation)

Here, Heidegger acknowledges the craft of the artist but subordinates it to the working of the work itself that opens a world and reveals something. Heidegger's shift from the artist to the work as primary creative agent is central to his philosophic contribution, overcoming the subjectivism of previous philosophy and aesthetic theory. However, his presentations lack adequate concreteness and tend to leave underlying processes vague and mysterious. He does not recognize the ontological role of the artist in shaping how the individual work that is brought forth becomes what it is as a particular work with a unique way of working. While it is true that the potter's work is guided by the nature of jugs, each jug is different in detail due to the specifics of the potter's work.

The creation of art is always a historically mediated process, reaching back to the stone age for pottery, painting, music, sculpture and poetry—while innovating into the future. The artist pushes previous inquiries further, confronting issues that arose in past works and adopting techniques that have been developed by earlier artists. For instance, the potter, in creating a jug that will open a world that discloses people enjoying the fruits of the earth and skies, explores how best to accomplish that, given the historically prevailing conditions and technologies. The potter selects the right clay and glazes. She experiments with how different construction techniques, various spouts and specific handle curves contribute to how the unique created jug works to open a specific world, in which the jug can work effectively as desired. The potter's craft, worked out on a specific, concrete piece of work, refines the being of that work, deciding how it will work, that is, how it will be.

Only through the historically situated labor of the artist is the work of art established the way that it is (its being) in the world that it opens—not just through historical change writ large, but through the concrete application of specific production technologies under particular socio-economic conditions. This process is suggested by Heidegger, but not investigated in sufficient social and historical detail. Benjamin's studies of mechanical reproduction and Adorno's writings on the culture industry provide important extensions and correctives to Heidegger, showing that in addition to the artistic and craft-related explorations of the artist, the current forces of production (e.g., mechanical reproduction) and the prevailing social/economic relations (e.g., commodification by the culture industry) affect the way a work opens (and conceals) its world.

The development of e-music illustrates the complexity of historic processes of progress and regress. We have already seen how the composers of e-music explored innovative ways to open acoustic worlds. However, there is also a retrograde movement: Technology enables new sounds but removes compositions of these sounds further from the comprehension of an audience. The origins of music in the human body (heartbeat, breathing), dance and the physicality of playing physical instruments are replaced in e-music by technical tasks that manipulate abstract parameters on machines. For instance, Stockhausen often computes the timing and other parameters of sounds mathematically rather than through bodily movements (Neill, 2002). Live, responsive performance is supplanted by methodical efforts in electronic laboratories far removed from potential audiences (Figure 3).

The issues of performance and audience raised by e-music had to be addressed. They led to the incorporation of sounds and techniques pioneered by e-music being integrated into and co-opted by more popular musical forms. This brought in live performance, reintroducing and even accentuating movement of the human body as a basis of repetitive rhythm (Glover, 2013). The electronic synthesizer, the sequencer of recorded sounds and even the computer-generated tape became additional musical instruments, eventually often subordinated to traditional instruments (piano, guitar) and practices (tonality, common tempo) (Neill, 2002). Innovative e-music sounds or rhythms were often used to introduce pieces of pop music that soon devolved into traditional song styles (Dunn, 1992). New genres also appeared, incorporating and concealing e-music techniques: electro-acoustics combining synthesizers, tape and instruments; rap mixing drum machines and recorded sounds; trance-music exploiting ethereal resonances and mechanized repetition. These hybrids were easier to market as cultural commodities and they frequently lost their aura of innovative openings to worlds of sound as disclosed in e-music. Electronic music had a profound impact on the history of music. It fueled a diverse array of new genres, enabling

innovative ways for music to be and work. Simultaneously, the technologies of electronic music were coopted by the pop-music culture industry, slightly modifying commercial music, but ignoring the e-music vision of opening worlds that disclosed the nature of sound. This history of e-music is much richer than suggested in Heidegger's simplified history of being.

(d) Relations of Artistic Form

One of Heidegger's last publications, *Art and Space* (1969/1973), is associated with his contact with sculptors (Mitchell, 2010). Here, Heidegger rejects the traditional view of sculpture as formed matter within an objective, pre-existing extended space. Although he does not discuss any specific example of sculpture, he considers how sculptures define "places" in relation to each other. Heidegger resorts to his critique in *Being and Time* of Newtonian space in favor of human places, now expressed in his later terminology. He writes that sculpture does not passively occupy homogeneous three-dimensional space, but opens-up regions in which people can meaningfully live:

> Sculpture [is] the embodiment of places. Places, in preserving and opening a region, hold something free gathered around them which grants the tarrying of things under consideration and a dwelling for man in the midst of things. (Heidegger, 1969/1973, S. 11/p. 7)

Sculpture, as a form of artwork, can reveal spatial being. Henry Moore's *Three-Piece Sculpture* (Figure 4) illustrates a region of places opened-up and embodied by a sculpture. The massive bronze forms of bonelike knobs and points of Moore's sculpture define multiple *places* in relationship to each other. They reflect each other as related, but each unique. The interconnected forms press upon one another and support each other, creating a complex of places that defines a structured region.

Figure 4. Henry Moore, *Three-Piece Sculpture: Vertebrae*, 1968-69, bronze, approx. 3' x 8' x 4'. Hirschhorn Sculpture Garden, Washington, DC. Photo by author.

By integrating three cast pieces into a single sculpture, Moore's work opens negative spaces between the pieces, in addition to and uniting the open areas surrounding the embodied forms of

the individual pieces. Here, the accessible space is not an unstructured abstract volume, but a well-defined system of openings that invite the beholder's eyes and body to circulate through and around the work to explore its variety and interrelationships. The work of sculpture works to disclose a structured space that would not exist without it, in which people can tarry and experience a world of meaningful inter-related places within a larger region.

The working involves a dynamic between revealing and concealing. As a work, a sculpture opens a devoted area around itself, structured by the sculpture's massed forms, which extends out from that work. The surfaces of the forms are revealed, but they simultaneously conceal what lies below, behind or beyond the surface: the interior of the wood, stone, bronze or other material, as well as the voids, hidden surfaces and surroundings.

Certain sculptures may attempt to open-up the concealed interior—for instance by poking a hole into or through the surface's forms or by chipping away the smooth outer surface to expose internal material. Or they may reveal the effort of carving the material by leaving traces of that human effort and procedure. Through such elements of the work's design, the interior is opened-up, but then simultaneously closed along the new surfaces (outline or *Riss*).

Negative form can be viewed as an effort to reverse what is concealed and what is revealed. In some sculptures, the space is revealed by simply outlining it or otherwise indicating it. In others, the normally concealed interior space is opened-up by providing just a structure to define it as a space. For instance, one could consider Giacometti's thin plaster sculptures of women to be presenting just the interior core of a human figure, absent the usual concealing layer of the body's flesh and skin.

Sculptors like Moore and Giacometti explore materials, sizes, shapes, representations and topologies that allow their sculptures to work to open worlds, places and regions for human tarrying. Through their sculpting, they pursue ontological investigations of how to let works be, such that they open certain sorts of worlds. For instance, Moore's sculpture of vertebrae incorporates his lifetime of sculptural studies of boney forms, reclining human figures and multi-piece interactions. Giacometti spent decades of his career building up and chipping away thousands of plaster representations of female models, struggling to get the sculptures to disclose the being of the human body in a specific way. Their skilled working with their materials, experiences, technologies and techniques defined their tireless working to create works of art. The works did not suddenly appear but emerged under their meticulous and relentless efforts to produce works with specific kinds of being. In fact, for leading modern sculptors like Rodin, Brancusi, Giacometti, Degas, Barlach and Moore, the finished sculptures are less important than the work of sculpting, the endlessly repeated working of their forms, materials and techniques to bring forth pieces that set into work some truth that they are implicitly struggling toward and gradually approaching.

Analogously to sculpture, e-music can be heard as sequences of sculpted moments of sound, often delimited and individuated by silences. In a lecture on "*The Four Criteria of Electronic Music*," Stockhausen specified that e-music was characterized by its focus on composing relations among times, tones, spaces and noise. His defining features of e-music were:

1. Unified time structuring.
2. Splitting of the sound.
3. Multilayered spatial composition.
4. Continuum of tone and noise. (Stockhausen, 1972)

His composition *Kontakte* was structured by de-composing sound into its parameters of temporal duration, timbral components, spatial location and noise band, as well as pitch and loudness—each defined along scales. Here, Stockhausen extended the intervallic serialization he learned from Schoenberg and Webern to all the parameters of sound, creating tones that had not been composed before, in more complex relationships, opening new possibilities of acoustic places and moments layered upon each other to create temporal structures.

Music, more explicitly than other art forms, creates sequential temporal forms. The being of a musical work according to Heidegger's analysis of art is its working, which is a process that necessarily unfolds in time. The character, being or origin of a work of music is not an attribute of its immediate presence but is disclosed through its manner of opening a sonic world temporally. Specifically, e-music harnessed electronic and digital technologies to control the timing of individual sounds, of phrases and of overall compositions. E-music explored innovative timings of sound wave forms, envelopes, sequences and movements. It not only replaced traditional timings but developed a wholly new systematic approach to temporality as a central dimension of control and composition. Some of Stockhausen's compositions allow for the sequencing of movements or even of sounds to be determined by chance, rather than by the score, making explicit the role of temporal sequence in the being of the sonic work.

Stockhausen methodically explored the being of sound and how works of music open acoustic worlds. He shifted the science of acoustics into a philosophy and ontology of sound by investigating the effects of the various parameters of sound on the working of e-music compositions to achieve musical works with innovative being. Many of Stockhausen's major pieces of e-music were designed, defined, composed and refined by him to disclose selected aspects of the being of sound through the working of the musical work. For example, his composition, "*Beethoven Opus 1970*," electronically transformed moments from Beethoven's oeuvre to re-disclose the acoustic being of Beethoven's sounds in the technological era. His monumental "*Hymnen*" manipulated sound samples from national anthems to disclose how they opened nationalist worlds, just as Hendrix's distorted electric guitar version of "*Star Spangled Banner*" opened a politically construed world for his audience at Woodstock during the Vietnam War.

As part of its working, a work of art functions as a communication between its creator and its recipients. It discloses to the listener/viewer/preserver what is rendered perceptible in the work—an opening of worlds that can be shared. Heidegger notes about the audience role:

> Preserving the work does not individualize people to their life-experiences, but draws them into their belonging to the truth that happens in the work, and thereby grounds their being-for and being-with-one-another as the historical standing-out of being-there (Da-Sein) in relation to unconcealedness. (Heidegger, 1935/1963, S. 55f/p. 690, my translation)

Thus, the work functions to build historically situated inter-subjectivity, grounded in the work. It opens ontological understanding: a shared understanding of the being of the sounds, work and world.

An artwork brings a work into the world, opening a space for it to do its work in its historical social setting. Of course, a work of music, painting, pottery or sculpture does not appear *sui generis*, on its own, as Heidegger's presentation might lead one to believe. Just as the clay jug, van Gogh's painting or Moore's sculpture required a complex crafting, based on culturally

developed and passed-down practices, Stockhausen's compositions called upon the skill and intellectual effort of a world-class artist and drew upon the state-of-the-art technical world to compose works with the proper being.

While Heidegger's focus on the being of the work is central to his contribution, it is also necessary to consider the role of the artist and the audience in not just passively dwelling in the world opened by the work, but also in actively determining the concrete and specific way a work, as a unique being, works. Talented artists are ontologists, sculpting the being of their works, as evidenced by the historically innovative forms of disclosure of the worlds they open.

e-Music in Socio-historical Context

Heidegger's writings on works of art can provide ground-breaking ways of viewing art, including music. They provide an alternative, ontological perspective from that offered by previous, subjectivistic or positivistic Western thinking about art, space, time and being. However, when compared with discussions by writers like Adorno and Benjamin, approaching from an analysis of historical development based on Marx, one finds Heidegger's descriptions lacking sufficient depth of social and historical considerations. Heidegger's writings take on a feeling of somewhat superficial jargon or mysticism (Adorno, 1964/1973). How does disclosure of a unique creative work take place concretely? How are the historical epochs of being given, such that one flows into the next?

The social theorist Giddens proposed a notion of "structuration," whereby social institutions and forces do not so much influence the behavior of individuals in a given society, as they are themselves produced and reproduced by the habitual practices of those people and their communities (Giddens, 1984). In this view, social structures exist only in and through these enduring and evolving reproductive patterns of repetitive behavior: Their being is temporal. The history of e-music—as a developing body of compositional techniques—can provide a model of the concrete social and historical kinds of processes of structuration by which the history of art and the development of the technological character of our age intertwine dialectically. In particular, we can see the historical dimension of e-music involving the situated being and activity of the works, composers and audiences as they interact in socio-historically concrete circumstances to structure the being of the e-music pieces.

The fact that e-music compositions reflected the availability of evolving technological means was not the result of some mysterious arrival and imposition of a new "epoch of being." Rather, the production and working of this music itself anticipated, proclaimed and contributed to the historical age. In the development of e-music, composers did not just take advantage of newly existing technologies to create innovative sounds. They also anticipated potential novel techniques and often invented the requisite tools. The working of the works of e-music propelled this historical change as well as disclosing it to the ears of the audience.

The history of being consists of the repetitive behaviors of people, such as the cultural practices embodied in the working of art works; it is not an outside force or source of determination, but an "eventing" (*Ereignis*) of the working of the historic works. E-music helped to define the technological era by incorporating technological elements into the succession of sonic works, which both reproduced established approaches to musical composition and on their basis produced novel extensions to it, which could in turn then be taken up in future works in

unanticipated ways. E-music composers and their works literally made history—the history of technological being. As Marx famously put it, "People make their own history, but they make it under inherited, found and pregiven conditions not chosen by them" (Marx, 1852/1963, p. 15).

Social practices are collected, preserved and expanded within the contemporary culture, as a massive collection of mostly tacit patterns of behaviors, which provide the conditions for the creation of new works of art. Socio-cultural practices are analogous to people's behavioral habits; Bourdieu (1972/1995) showed how much of one's "habitus" is grounded in one's body and personal artifacts (e.g., clothing, food, home and kinship structure). Technological practices of music production are embodied in the body of work of e-music compositions, as written, performed, recorded and heard.

The habitus, culture, institutional base of structuration or knowledge of compositional technique is a "system of durable, transposable dispositions" (Bourdieu, 1972/1995, p. 72). Skill or expertise does not consist of a store of propositional statements, mental representations or explicit rules, but as the ability to engage over time in various extended practices. It is a matter of dispositions or the likely ability to respond extemporaneously to similar situations—to "go on" as Wittgenstein (1953) said—rather than fixed propositional knowledge or trained behaviors. It grows and becomes better defined through reiteration. The work of a composer or the working of a composition takes place by improvisational reproduction of the repetitive practices that occur in this system of habits. The replication typically takes place tacitly, without following an explicit rule of behavior or aiming at a preceding intention—adapting previous models intuitively and creatively, neither mechanically nor consciously. It may be accompanied—especially retrospectively in reflection—by a folk-theory narrative or account. However, the way to comprehend it theoretically is to understand it historically in terms of the forces and processes that mediated the original occurrence of the practice, rather than only the circumstances surrounding its current repetition.

E-music evolved out of previous compositional practice, such as established approaches to serialization and orchestration. The addition of new sonic forms and techniques involved reflective and articulated considerations by composers concerning their aesthetic circumstances and possibilities. These additions contributed to the history and growing scope of e-music—often being incorporated in updated technologies, such as synthesizers, that helped to institutionalize the practices made easier and standardized by such tools. Technological artifacts (tools, works, texts) could then serve as "immutable mobiles" (Latour, 1990) to spread the innovations or "boundary objects" (Star, 1989) to bridge different compositional approaches. There was an e-music community of composers, performers, critics and audiences, within which processes of apprenticeship and "legitimate peripheral participation" (Lave & Wenger, 1991) transformed the community as well as the nature of new works. As time went on and the once shockingly innovative practices of structuring sound became habituated to by audiences as well as composers, they tended to lose their impact and become integrated into the commercial music industry. Thus, history happened. That history can best be understood by interpreting the e-music worlds in which the new practices originally occurred.

Viewed from a critical socio-historical or Marxist perspective, Heidegger's analyses are not sufficiently grounded in social reality, habitus and structuration processes. As already noted, Heidegger over-looked the post-impressionist historical context of van Gogh's painting. When van Gogh painted the peasant's shoes in 1886, photography had already become well established as an art form and was about to become readily available to the public with the Kodak box

camera, so there was little need for painting to imitate visual reality. Rather, van Gogh's contemporaries were exploring effects of lighting and techniques of applying pigment. Van Gogh's contribution was to take up the lessons and experiments of his predecessors and colleagues and to create works that opened new possibilities in the technology of painting. The evocative quality of his painting of shoes—that captured Heidegger's attention—was due precisely to its shift away from photographic realism to a focus on the painter's uses of light and pigment, which dramatically highlight the emotional, social and situated character of the subject—missing from standard photographic images.

Heidegger similarly ignores the meticulous efforts that go into making a pottery piece, including techniques and technologies developed socially over generations. Likewise, sculpture opens space through the complex processes that go into forming the sculpture, through which the sculptor fine tunes the being of the work and of the world it opens. Perhaps the artist's ontological contribution is even clearer in e-music. This artistic movement explored how to create works of music that effectively opened worlds of sound. It thereby showed in technical detail how the being of individual sounds could be constructed and then composed into specific works of music that would disclose particular new worlds.

It is also important to recognize that the historical process of e-music ultimately unfolded concretely and dialectically within the relations of commercial music. For music in general, the mechanical reproduction (tapes and records) and later the digital production of sound (mp3s and iPods) not only provided for a tremendously expanded global audience for Western music, but also transformed the nature of musical reception, as anticipated and documented by Benjamin and Adorno. By increasing control over the timing of sound events and even automating their repetition, e-music led not only to synthesizers of universal sound production, but also to sequencers of rhythms, such as popular drum machines.

The long-term result of the e-music genre was not just to open the world of sound as understood in technical terms of frequency, amplitude, noise, algorithmic patterns, and relations among temporal moments or acoustic places. Also, it was to devolve into commercialized forms of disco, rap and new-age trance music, which could be profitably manufactured with drum machines (Dunn, 1992). Much of what e-music had revealed was thereby re-concealed by pop music, as practices of music production became more distant from the original e-music innovations and more enmeshed with business practices. The relations of production in capitalist economies (commodification and monetary profit) channel the evolution of the technological means of production (Marx, 1867/1977). This must be recognized in order to extend the understanding of music, art and being from the perspective of Heidegger's ontology.

In addition to painting, pottery and sculpture, Heidegger considered poetry. For him, this was the most important form of artwork, because it involves the working of language. Language is the house of being, in which social practices are articulated and preserved, as they define the flow of the history of being. Unfortunately, it is beyond the scope of this essay to consider the working of poetry and the role of language, as would be necessary for a more complete reflection on Heidegger and art.

Heidegger's philosophy of being, as it evolved through his life's work, provides useful ways of considering the nature of music and other art forms. Conversely, considerations of socio-historical aspects of artistic production provide important correctives to Heidegger's incomplete

analyses. E-music offers an example of musical development—contemporaneous with Heidegger's writings—that opens a view that can both confirm and extend his insights.

References

Adorno, T. W. (1948/1973). *Philosophy of modern music* (A. G. Mitchell & W. V. Bloomster, Trans.). New York, NY: The Seabury Press.

Adorno, T. W. (1964/1973). *The jargon of authenticity* (K. Tarnowski & F. Will, Trans.). Evanston, IL: Northwestern U. Press.

Adorno, T. W., & Horkheimer, M. (1947/1972). *The dialectic of enlightenment* (J. Cumming, Trans.). New York, NY: Continuum.

Benjamin, W. (1936/1969). The work of art in the age of mechanical reproduction (H. Zohn, Trans.). In H. Arendt (Ed.), *Illuminations.* (pp. 217-251). New York, NY: Schocken Books.

Bourdieu, P. (1972/1995). Structures and the habitus (R. Nice, Trans.). In *Outline of a theory of practice.* (pp. 72-95). Cambridge, UK: Cambridge University Press.

Dunn, D. (1992). A history of electronic music pioneers. In *Eigenwelt der apparatewelt: Pioneers of electronic art.* Linz, Austria: Ars Electronica exhibition.

Eimert, H. (1957). What is electronic music? *Die Reihe., 1*, 1-10.

Giddens, A. (1984). Elements of the theory of structuration. In *The constitution of society.* (pp. 1-40): U of California Press.

Glover, R. (2013). Minimalism, technology and electronic music. In *Ashgate research companion to minimalist and postminimalist music.* (pp. 161-180). Farnham, UK: Ashgate.

Habermas, J. (1992). Work and weltanschauung: The Heidegger controversy from a German perspective. In H. Dreyfus & H. Hall (Eds.), *Heidegger: A critical reader.* Oxford, UK: Blackwell.

Heidegger, M. (1927/1996). *Being and time: A translation of Sein und Zeit* (J. Stambaugh, Trans.). Albany, NY: SUNY Press.

Heidegger, M. (1935/1963). Der Ursprung des Kunstwerkes. In M. Heidegger (Ed.), *Holzwege.* Frankfurt a. M., Germany: Klostermann.

Heidegger, M. (1935/1964). The origin of the work of art (A. Hofstadter, Trans.). In A. Hofstadter & R. Kuhns (Eds.), *Philosophies of art and beauty.* (pp. 647-701). New York, NY: Modern Library.

Heidegger, M. (1950/1967). Das Ding. In *Vorträge und Aufsätze II.* (pp. 37-60). Pfullingen, Germany: Neske.

Heidegger, M. (1962/1972). *On time and Being* (J. Stambaugh, Trans.). New York, NY: Harper & Row.

Heidegger, M. (1969/1973). Art and space (C. Seibert, Trans.). *Man and world. 6*(1), 3-8.

Latour, B. (1990). Drawing things together. In M. Lynch & S. Woolgar (Eds.), *Representation in scientific practice.* Cambridge, MA: MIT Press.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge, UK: Cambridge University Press.

Manning, P. (2004). *Electronic and computer music*. Oxford, UK: Oxford University Press.

Marx, K. (1852/1963). *The eighteenth brumaire of Louis Bonaparte*. New York, NY: International Publishers.

Marx, K. (1867/1977). *Capital* (B. Fowkes, Trans. Vol. I). New York, NY: Vintage.

Merleau-Ponty, M. (1961/1964). Eye and mind (C. Dallery, Trans.). In J. M. Edie (Ed.), *The primacy of perception.* (pp. 159-190). Evanston, IL: Northwestern University Press.

Mitchell, A. (2010). *Heidegger among the sculptors: Body, space and the art of dwelling*. Stanford, CA: Stanford University Press.

Neill, B. (2002). Pleasure beats: Rhythm and the aesthetics of current electronic music. *Leonardo Music Journal. 12*, 3-6.

Puckette, M. (2007). *Theory and techniques of electronic music*. Singapore: World Scientific Publishing Company.

Stahl, G. (1975). *Marxian hermeneutics and Heideggerian social theory: Interpreting and transforming our world.* Unpublished Dissertation, Ph.D., Department of Philosophy, Northwestern University. Evanston, IL. Web: http://GerryStahl.net/elibrary/marx.

Stahl, G. (1976). Attuned to Being: Heideggerian music in technological society. *Boundary 2. IV*(2), 637-664. Web: http://GerryStahl.net/publications/interpretations/attuned.pdf.

Stahl, G. (1993). *Interpretation in design: The problem of tacit and explicit understanding in computer support of cooperative design.* Unpublished Dissertation, Ph.D., Department of Computer Science, University of Colorado. Boulder, CO. Web: http://GerryStahl.net/elibrary/tacit.

Stahl, G. (2006). *Group cognition: Computer support for building collaborative knowledge*. Cambridge, MA: MIT Press. Web: http://GerryStahl.net/elibrary/gc.

Star, S. L. (1989). The structure of ill-structured solutions: Boundary objects and heterogeneous distributed problem solving. In L. Gasser & M. N. Huhns (Eds.), *Distributed artificial intelligence.* (pp. 37-54). San Mateo, CA: Morgan Kaufmann.

Stockhausen, K. (1962). The concept of unity in electronic music. *Perspectives of New Music. 1*(1), 39-48.

Stockhausen, K. (1972). *Four criteria of electronic music*. YouTube: https://www.youtube.com/watch?v=7xyGtI7KKIY.

Wikipedia_contributors. (2021). *Electronic music*. Wikipedia, The Free Encyclopedia. Web: https://en.wikipedia.org/w/index.php?title=Electronic_music&oldid=998812023.

Wittgenstein, L. (1953). *Philosophical investigations*. New York, NY: Macmillan.

Bio

Gerry Stahl followed the development of e-music while researching a philosophy dissertation on Heidegger and Marx in Germany and the USA in the 1960s and 1970s—and even experimented a bit in electronic and computer music, without success. His eventual career was in information science and research on computer support for group cognition (see http://GerryStahl.net). He retired as emeritus professor from Drexel University and now carves wood sculpture in Cape Cod.