

The Essence of Interactive Expression

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Interactivity

Interactive artworks are like video games played in an art gallery. Video games are concerned with building “interactive fictions” [1] and interactive artworks “have an open ended framework that allows or even encourages the audience to ‘complete’ their creation” [2]. The essential technological components that make up interactive technology are universal. Interactive art facilitates non-linear narrative generation via human computer interaction, thereby, creating co-generated environments that facilitate a variety of possible experiences, narratives and events. The advent of dynamic bi-directional interactions afforded by computational processes in newly emerging interactive art presents many exciting possibilities for creative venue. However, just as with classically produced mono-directional expressions, there are functional and structural limitations, that must be accounted for when building interactive artworks. Effective transference of the *‘essence of an expression’*, depends on meaning-making mechanisms that can be impeded by the limitations of creative electronics systems. These mechanisms must be accounted for in order to ensure that agency is given to a user to excogitate the meanings of an interactive artwork. The user, participant, observer, or what I will call the *‘artists-viewer’* is in control of decoding the *essence of an expression* from a series of dynamic interactions that are designed by what I call an *‘artist-architect’*. In addition, the aesthetics of a given interactive artwork and the necessary interactive elements required to evoke the *essence of an expression* must be considered.

Interactive events that occur in a gallery space are performances much like “Integrated Performance Media ... computer mediated theater art” [3] and the actors are both human and computer. The human performer’s role is to interact with the computer and at the same time witness and transcode the performance first hand. If there are any passive observers watching

the *artists-viewer* perform with the computer, they too become a part of the audience but they do not control the way that the interactive experience unfolds. Passive viewers are therefore not *artist-viewers* but rather passive witnesses to the performance, and although they are not able to control the event, they are nevertheless a conduits for the expression represented by the empathetic experience that they have with the *artists-viewer*. “What makes art is that it is primarily concerned with the expression or the communication of an emotion” [4], or what I am calling the *essence of an expression*. With classical art, “an inner emotional state is externalized; it is brought into the open and transmitted to viewers, readers and listeners.” [4] What makes interactive art different is that it can bio-physically and dynamically respond to literally evoke said emotions in the human actor through a series of socially engineered immersive bio-feedback experiences and sensations. Therefore, the emotion being communicated in the artwork is not insinuated or signified but experienced literally and simultaneously witnessed by the human actor.

Is it possible for the *essence of an expression* to be passed from the *artist-architect* (the designer of an interactive experience) to the participating *artist-viewer* (the performer and consumer of an interactive event) by controlling the elements of the interactive experience? How would the ‘*essence of an expression*’ be passed from an *artist-architect* to an *artist-viewer* within the interactive elements of an artwork? Can the *essence of an expression* be passed more effectively in an immersive experience, for example, via the use of dynamically interactive bio-feedback loops?

In order to briefly address these questions we must first take a look at the nature of communicating the emotional *essence of an expression* and some differences between classical artistic expression and modern interactive art.

“In contrast to interactive installations, Dominance transfer is not usually sensed in static art forms. ‘Traditionally the interaction of a viewer with the work of art has been via looking and respectfully appreciating’ [5] under this, the audience is often positioned as inferior to the work and always physically passive. Whereas, the exclusive intellectual and physical hegemony does not exist in computer-based interactive media art.” [6]

The Essence of an Expression

Trying to pinpoint the precise location of the *essence of an expression* is nearly impossible. “It is only by signifying something that an expression can refer to something objective, so that the expression signifies or names the object by means of its meaning. The essence of an expression exists exclusively in its meaning...” [7] It is contained somewhere between or within the physical presence and aesthetic representation of an experienced sensation. Can it be contained in the design of a series of interactive experiences? Can it be transferred by simply observing a performance or even imagining an experience? It is likely impossible to universally answer many of these questions because each interactive experience probably contains a unique combination of several elements. Nevertheless, the transmission and retransmission of the *essence of an expression* seems to be an ongoing cyclical paradigm consisting of a physical conduit and a series of experiences that, when combined, result in a sensation that evokes said *essence of an expression*. Due to the seemingly infinitesimal and even invisible routs and pathways that the *essence of an expression* can travel through, it would also seem impossible that one could ever share the sentiment ‘I know what you mean’ or ‘I know how you felt’. Yet, when I tell a story about my experiences with an interactive artwork, it seems I am able to communicate something of the original experience, even without any visual or audible aid.

Can an experience have multiple representations that all lead to the same *essence of an expression*? When a story of an experience is told and retold and grows to be a shared collective consciousness between each successive witness in the tree, it somehow maintains something of the essence of the original experience. It is as though we are capable of reconstituting or constructing an event (perhaps by accessing and combining our sensorial and life experience mental history) even if we never experienced the event first hand. In this way it would seem that the *essence of an expression* is capable of transcending the mediated modes of transmission and somehow averting deliquesce as it moves from one human conduit to another. Nevertheless, it is still possible that the more mediated nodes there are in a link of successive transmissions of a given transcoded experience or *essence of an expression*, the more likely it is that a kind of pixilation occurs. For this reason, it is necessary to have the

original interactive artifact as an anchor to the intended *essence of an expression* as given by an *artist-architect*. The need for interactive artworks is therefore present in the fact that it can contain codified records of a given experience designed into the interactions of the artifact itself.

In addition, “applied psychophysiology” [8] such as neurofeedback and biofeedback have become important techniques for targeting and exocitating the *essence of an expression*. Reactions and functions of the body are recorded and the willful intent of each user interaction is combined with their less controllable biological responses to send inputs to a computer. Each deliberate human action, in the human-computer interaction performance, is combined with less deliberate physiological manifestations that occur within the *artist-viewer’s* body and represents their ‘felt’ experiences. This model can be seen as a ‘dynamic mode of expression’ (Figure B) as opposed to a classical ‘static mode of expression’ (Figure A) that is more concerned with the one way transmission of an artwork-message.

Adding the capacity for an object to change its physical properties according to the reactions and interactions of a human body makes both bodies one and the same for the duration of an interactive artworks manifestation. “A future change took place with the introduction of interactive art, which insisted that the viewer become some part of the work or art and participate in its creation.” [9]

Figure A:
The Static Mode of Artistic Expression

A viewer is witness to an artwork or artifact that theoretically transfers an intended message via common cultural, psychological or other visual clues and effects. "People may even come to appreciate the affective, historical, and cultural aspects of the work they are viewing, occasionally more than they enjoy its purely visual aspects." [10] A static artifact is limited by the fact that it cannot change to adapt to the each unique viewer and viewing experience and the viewer is not given any license to literally change and more formally interact, as opposed to simply react to the artwork. Of course the viewer always has the freedom of personal interpretation but the artifact remains physically unchanged. In fact, the obsessive job of art conservationists is to ensure that artifacts remain unchanged so that each viewer may experience the original work. The authority and responsibility to communicate the *essence of an expression* is then given to the artifact and the space in which the artifact is presented, not to the viewer or the viewer's interpersonal experiences. Therefore, the artifact is the object of importance and not necessarily the intended expression.

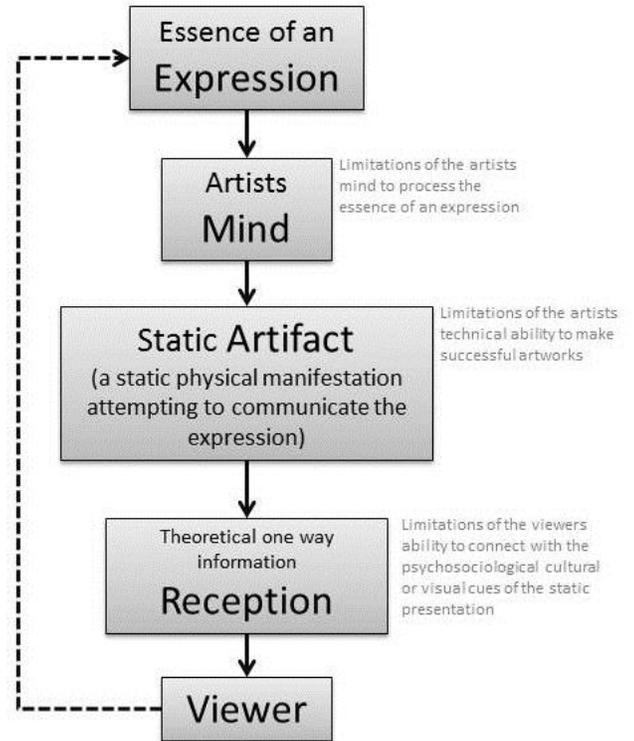
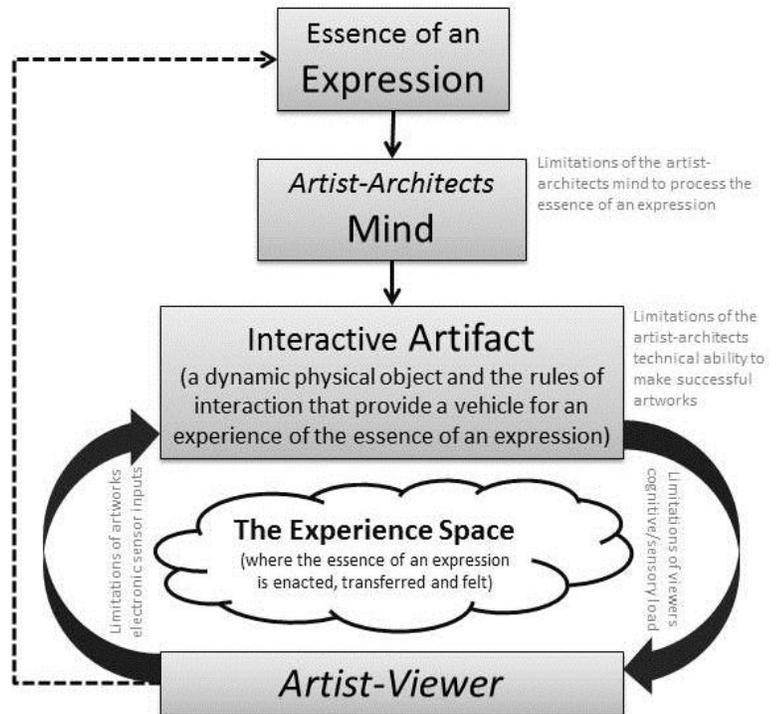


Figure B:
The Artist-Architects Dynamic Mode of Artistic Expression

A viewer is also the artist and a conduit for the enacted expression, that is represented by experiencing an event unfold while interfacing with a strategically designed interactive artifact. “What is central to interactive art is not so much the aesthetic form in which a work presents itself ... but the behavior the work triggers in the viewer.”[11] The emphasis is on the successful experiencing of an intended sensation and I suspect this has largely to do with giving autonomy to a viewer to manifest her own sensations. The experience space is what is being preserved here and the interactive experience is what is given authority to unfold the *artist-architects* intended essential expression. The specific of interactions can vary but the preservation of the sensation is accomplished by the carefully designed interaction that leads all users to a similar *essence of an expression*.



In this analysis I am also inadvertently insinuating that classical art production models are more concerned with communicating some kind of socially relevant message and that contemporary interactive art is more concerned with the capture, storage and transmission of a sensations or experiences - perhaps more primordially connected to our essential being. Such sensations could be considered less advanced in that they are basic forces and would likely have little power to carry complex narratives that may be required to address some political, social or historical idea. It may be the case however that interactive art is also concerned with the delivery of some complex idea and simply employs an interactive experience or sensation to illicit the idea in the viewer’s mind. In both cases however, there remains the complication of subjective interpretation and it is undoubtedly unavoidable.

I am personally in agreement with Stephen Davies's fourth conclusion on the morals about message in art in that, "an artists is not automatically absolved of responsibility for messages that are justly attributed to his work merely by pointing out that he is one thing, and the work is another." [12] In addition, he points out in his first conclusion, that "art, unlike simple communicative discourse, generally involves some sort of framing or mediating device, whether that of a fictional narrator, or an assumed voice, or an internal point of view." [12] I would add to this that mediation of the perceived subjective conceptual position of the artist must be paired with a critical look at the flow of the physical, interactive experience of the artifact when considering interactive art. In this way, there is a kind of interaction ethics that must be farther researched when considering the implications of literally immersing an *artist-viewer* in a visceral, perhaps partially uncontrollable sensory space that may in fact be traumatizing.

Interactive Modes of Bodies: Human and Machine

There are a wide variety of interactive modes that move between the physical and virtual spaces of the body and mind. This paper is concerned with the interactive space created commonly in an art gallery between an interactive physical artifact and a viewer/participant as opposed to virtually hyper mediated interactive worlds where "inter-actors participating in an artificially generated model worlds moves beyond the human-machine interface." [13]

In order for information to be passed from a classically static artifact to a viewer it travels via light or in some cases sound or even through touch (as with a sculpture). "New interactional devices enable novel and potentially profitable forms of interaction." [14] Virtually any mode of classical, one way, sensory reception can be made dynamic with the advent of interaction. Every sense affected by experiencing an interactive artifact can be catered to by dynamically changing the artifact to act out an interactive event designed to guide the *artist-viewers* to a given sensation. In addition, each mode of interaction can consist of a vast number of interwoven cyclical events. In order for an artwork to produce interactive affects, as opposed to an action-reaction linear narrative, a two way transmission of information must be established. Interactive artworks require inputs that can receive physical information such as sound, light, heat, vibration, piezoelectric effects and so on. Inputs can also be passively

captured information via ‘observations’ made by the interactive artwork computer such as eye movements (via gaze tracking) and bodily gestures (via gesture tracking).

Biofeedback interactivity is even more immersive because it only partially gives control to the *artist-viewer* to make decisions as to how to interact with the artwork. The remaining interactions are passive events involving auto-physiological responses of the body. These bio-physical responses can become a part of the inputs given to an interactive artwork and therefore part of the mechanism of interaction, yet they are passively given, sometimes even without the conscious or deliberate intent of the *artist-viewer*.

Biofeedback is seen differently by different fields of research. A biologist or neurologist may claim that the purpose of biofeedback “is to teach people how to ‘tune in’ to their bodies so that they may regulate” themselves. [15] It is well documented in several fields of research that by connecting bio-sensors and the human body; bio-feedback loops can be established to facilitate intense immersive interactive experiences. Designing these experiences with the intention of transferring specific sensations can result in a new form of communication specific to the flow of the *essence of an expression*.

An *artist-architect* with enough knowledge of the physiological responses of the human body, given the appropriate stimulus (as are well documented in cognitive, neurological, physiological, and physiological studies) would be able to focus on and control the interactive elements in such a way as to target the transmission of an *expression* dynamically, regardless of the overwhelming possibilities in the specific interactive events that may unfold (as given by each individual *artist-viewer* and interaction event). In other words, interactive biofeedback art has the potential to dynamically adapt to an *artist-viewer* in order to more consistently guide them to a specific experience or maybe even a specific sensation and possibly even specific sensorially deduced logical realization.

This would be analogous to a movie that could change and adapt the narrative, visuals and audio depending on the precise bio-physical or neurological reaction of a given viewer such that it would not only communicate a narrative, but ensure that a specific sensation was achieved. Something like a choose your own adventure whereby the book could know your pulse, pupil

dilation and brain wave frequency and change the narrative, live as you read along to make sure your experience was specific to an intended sensation or experience. Of course, there is the perspective that “computer-based art manages the reactions of its audience so that they’re no longer thinking for themselves. The argument for mind control. Having enfeebled the mind, it’s a short step to taking control” [16] I am of the position however, that such immersive biofeedback driven art is like any other technology. A hammer can be used to bash someone’s head in or build a house [17]. What this paper is concerned with is not the elements of potential mind control that exists with immersive biofeedback driven interactive art, but rather the potential for capturing and sharing sensations from generation to generation.

This is particularly significant because codified records, such as movies, are narratives that carry with them sensations that are specific to the place and time in which they are produced. “Arts and artifacts so considered in terms of social function become, then, major instruments for research into the past. Art history which uses its data in this way becomes a principal discipline for the study of history in and through art.” [18] However, the ever expanding cultural/historical record has yet to box-up and preserve raw sensations. Interactive creative electronic artwork can be manifested into dynamic artifacts that adapt to the raw and ancient biological systems of a human participants and use interactive bio-feedback systems to become conduits for the preservation and transmission of sensations, experiences, or as I would like to posit - the *essence of an expression*.

In addition, bio-physical reactions are more universally experienced than specific socio-cultural signifiers and therefore more accessible cross-culturally. There is also something to be said for the difference between ‘meaning driven’ experiences vs. viscerally experienced events. Meaning driven expressions require the ‘ah-ha’ moment to occur in the psyche of the viewer, whereas something that can be viscerally experienced requires no explanation, it is simple felt. It is important to realize that the ‘knowledge’ generated from an experience (that may not have codifiability or be logically deducible) is just as important as ‘knowledge’ that is transferred via ‘meaning driven’ logically deduced information symbols and systems. The raw experience however, is more visceral, closer to the essence of an experience that exists pre-definition. It is

not impossible to codify the *essence of an expression*, but it requires interpersonal specificity that cannot be accomplished by generalizations that are prevalent in commonly used cultural iconography. Instead, the *essence of an expression* must float from conduit to conduit without ever manifesting twice in the same way, yet carrying and communicating an essential libidinal human experience.

So much more about the interactive experience needs to be examined in order to establish standards similar to that of something like classical painting. There are “practice guidelines and standards of the Association for Applied Psychophysiology and Biofeedback (AAPB)” [19] for physicians and therapists, but what of the standards of biofeedback for artists? Perhaps aesthetics should be our standard. We understand the aesthetics of light, to some extent, when we look at a painting. The study of music has established much discourse around the aesthetics of sound. The study of tactile, tangible, haptic and physical touch aesthetics go as far back as ancient sculpture but have contemporary roots in kinetics, bio-dynamics, and a variety of kinesiological and physiological exploration that could be merged into a multi-disciplinary view of the ‘aesthetics of immersive interaction’.

All of these elements could be present in an interactive electronic artwork, but, what do the aesthetics of interactivity actually ‘look’ like? Is it possible for an interaction to be forced and ‘hard’ or subtle and ‘soft’? Is an interaction big, fast, invisible, dirty? Perhaps the ambiguous language currently used to somehow effectively describe classical art will prevail for the same amount of time that its partner ‘subjectivity’ lives. For the time being, and as interactive art gradually establishes a place in the broader arts, the aesthetics of an interaction seem to be reduced to a criticism of artificially generated human-computer interaction and largely determined by the limitations of sensor technology and computational response time or the resulting ‘quality’ of an expected interaction.

Essentially, if the technology used in a given interactive artwork functions according to the expectations of a user-participant it ‘works’ by producing an interaction that is expected by its audience. If not, a resulting frustration is aimed at a perceived malfunctioning technology and the intended impact can be lost when an interaction is unexpectedly unresponsive or if there is

an interruption to the expected action-reaction process. Current discourse surrounding the aesthetics of an interactive art is somewhat limited to a fine line between managing the interaction expectations of an *artist-viewer* (user-participant) and introducing new and more immersive sensations and experiences. Of course, the more unpredictable actor of the two in a human-computer interaction is the human and “methods to differ intended user inputs from unexpected ones are very important.” [20] For example, if a participant is meant to hold an object in their hands but instead they throw it up against a wall in a fit of rage, the computer must somehow come to understand that they themselves did not collide with a wall at the high speeds indicated by the sensors in the object intended to passively record the objects movements and translate them to visuals on a screen. In a way, a multiplicity of possibilities must be anticipated in order to ensure a wide variety of unexpected behavior is accounted for from both participants – arguably a good code of conduct for any first-time experience or interaction between any two bodies.

The *artist-architect* is also confronted with the problem of designing around data transliteration, transcoding, or in actuality transmutation. When we take a signal and transform it to some other representation in order to store or transmit it, we contaminate it in some way. If we consider the classic example of a pixelated digital image; there are several problems that are all interconnected. First, we have the complication of capturing the image, and then we have the problem of interpreting the information captured so that it can be stored, and finally we have the problem of decoding and retransmitting the signal as it passes from life to device and back to life. The problem that we are discussing here is that of data abstraction. Data that is too abstracted when it is recorded cannot be effectively looped into an interactive experience, even with the addition of biofeedback, because the *artist-viewer* becomes disoriented and confused as to what actions to take. Each action taken results in some kind of reaction from the artwork but if the reaction is unintelligible then the user does not know how to interact with the artwork and loses the sense of immersion. This problem can arise directly as a result of poorly recorded data and nonsensical data representations.

It is important to consistently improve our general vocabulary with regards to interaction aesthetics however, because it is the introduction of new interactive sensations that can result in improved situational awareness and sensorial knowledge, perhaps the most important reason for making interactive art, an *artist-architect* must always be pushing the boundaries of viewer expectations and immersive experiences while retaining an audience and making intelligible his work.

The Artist-Architect and the Artist-Viewer

Interactive electronic artworks are designed by *artists-architects* not 'artists'. The *artists-architect* builds an environment that facilitates a space where an *artist-viewer* can enact and thereby produce and simultaneously witness the unfolding of an experience driven event that represents the 'artwork'. The 'artwork' is therefore not contained in the artifact itself, but rather in the combination of the artifact and the resulting interactive experience as is specific to each *artist-viewer*. In order for successful interactive art to unfold, the *artist-architect* must relinquish a degree of autonomy to the *artist-viewer* with regards to the precise manifestation of each expression and subsequent artwork. The artist-viewer therefore assumes full ownership of the process of the unfolding event and the resulting interpersonally materialized *essence of an expression*. A variety of possible interactions must be accounted for by an *artist-architect* in order that an interactive environment has a degree of freedom for the *artist-viewer* to perceivably reach their own conclusions about a transmitted sensation or expression. This manufactured autonomy is something that can be designed into an interactive artwork and biofeedback responses can help an interactive system monitor and respond to each unique interaction to provide guidance for an *artist-viewer*.

Types of *artists-architects* may range from experience designers, to computer game designers, software engineers, and even something like interactive museum display designers. Any designer who builds interactive environments that facilitates the unfolding of an event (enacted by a human-computer interaction) and from which transference of an expression is caused should be considered an *artist-architect*. On the other hand, any conscious-being capable of

interacting with an *artist-architect's* invention and materializing the intended *essence of an expression* could be considered an *artist-viewer* (as opposed to just a viewer).

These broad and inclusive definitions are also limitations in the cohesive expansion of this stream of art due to the lack of general availability, education, and/or industry resources supporting the interactive creative electronic arts. This is a problem that is being overcome by the accessibility of inexpensive and widely available creative electronics, sensors, open source software, and distributed efforts in a variety of academic and professional worlds. A growing trans-disciplinary community is benefiting from creative interaction technologies, but the facility gap remains within the education and professional arts industries. An important point of interest here is that environment (both physical and situational) affects the *artists-architect's* relationship to the *artist-viewer* in that there are situational expectations of interaction that are location and situation specific. For example, if an *artist-viewer* is at an art gallery and is aware that they are expected to interact with an artwork, she might have different expected outcomes than if she was interacting with an exhibit at the museum of history. In the latter instance, there is an expected learning outcome that is more to do with some kind of information transmission and with the former art gallery experience; the expectation can be much broader. There are almost no limitations to the experimental, visceral and new body-mind immersions that can come from designing interactive artifacts for the art gallery space. With this exciting thought comes the possibility of exploring uncharted territory of the mind, body and soul.

Future Visions of 'The Magnetronic Effect'

The Magnetron is an interactive artwork that is designed to facilitate an interactive experience that connects the *artist-viewer* to themselves via the reflection of their bio-electrical bodily expressions. The artwork consists of a large semicircle display that contains thousands of points or 'pixels' designed to become small magnets that attract micro-metallic particles floating in a quasi-FerroFluid. The particle-pixels can be arranged into any mono-chromatic image. When a viewer first approaches the work their physical reflection is reflected back to them via a black (particle) and white (background) moving image, much like Daniel Rosins

“Wooden Mirror”, but rather in metallic pixels. Once the presence of a human face is detected by the Magnetron, a plinth standing off to the side of the artwork is illuminated an EEG device and instructs the person to place it on their head. Once the EEG device is placed on the *artist-viewer’s* head, a wireless signal is sent to the Magnetron that controls the display in such a way as to represent and reflect the mental activity of the *artist-viewer*.

The magnetronic effect is the collective electromagnetic expression of the human body and results from the naturally occurring bioelectrical signals of the neurological apparatus. The Magnetron is intended to explore the magnetronic effect of the body and I suspect that the collective electromagnetic effect expressed by the human neurological apparatus can be collected, recorded and retransmitted to be received again. I suspect that there is an entire sense of the human body that results from and is connected to the magnetronic effect and is in part responsible for the ‘good’ or ‘bad’ feeling we get from meeting someone in person. I also suspect that the magnetronic effect can be layered as would be seen with the collective consciousness of a group of people. It could be what connects one person to another during a moment of empathy, or what we travel on when we move in and out of our body during unexplained events of the mind. It could even be the place where the *essence of an expression* travels from one body to another. In addition, I suspect that magnetronic signals can be transmitted over large distances. We do not just communicate our feelings and sensations but we transmit them at the same time over the magnetronic network. It is a network of the human condition and expression that connects all people. In fact it connects all things capable of having an electrical charge. What if we could trap it, preserve it, play with it, and pass it forward to future generations?

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