To Be Decided

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In this paper I point to aspects of Heinz von Foerster's work that might be considered, normally, under the heading of art, a heading rarely used to describe this work. Starting by referring to a paper —"Heinz von Foerster: the Form and the Content" (Glanville, 1996b)—that I wrote for Foerster's 85th birthday festschrift (Glanville, 1996a), I introduce several art type concerns that can be found in Foerster's work, then move on to consider the culture in which Foerster grew up. Using, as a metaphor, the argument that Janik and Toulmin (1973) make in the case of Ludwig Wittgenstein, in their study of Wittgenstein's Vienna, I proposal that there is a similar study to be carried out in Foerster's case, if we are to better understand Foerster's legacy.

Form and Content

In 1996 I commissioned, compiled and edited a festschrift for Heinz von Foerster's 85th birthday. My own contribution originated in my first encounter with Foerster,[2] when he (together with Humberto Maturana) visited Gordon Pask's doctoral students at Brunel University, and we all went to dinner together afterwards. Foerster presented the substance of his paper "Notes on an Epistemology for Living Things" [republished in Foerster 2003d[3]]. As the one student present who came from an art background, I was astonished at the presentation, for it was the first time in an academic environment that I had heard anyone speak in a manner that reflected their content (rather than just explaining it). This matched the prescription for a work of art I had been working with for some years: in my view, a work of art may be achieved when what is said (the content) matches how it is said (the form) so that they are indistinguishable: At this point, the telling and the message become one, and there is no need for, or possibility of explanation. As it happens, this is also became an important aspect of the formulation of what I called Objects in my PhD [Glanville 1975, examined by Foerster]. At such a point, we have self-reference: The story tells itself.

In my contribution to the festschrift (Glanville, 1996b), I argued that several of the papers Foerster had written could be considered, in themselves, as art. At its most direct, this argument is based on the assertion linking form and content. For example, in "Notes on an Epistemology for Living Things," Foerster (2003a) presents his contentions about circular systems and circularity through an argument that is, itself, completely circular. In this manner, the way of saying matches what is said: Foerster's

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2. According to Bernard Scott's diary 20 April 1972
3. This paper was originally published in French as "Notes pour une epistemologie des objets vivants," pp. 401-417 in the book *L'Unité de L'Homme: Invariants Biologiques et Universaux Culturel* edited by Edgar Morin and Massimo Piattelli-Palerini and published in Paris by Editions de Seul. The English original is a BCL reprint.

(scientific) paper matched my criterion for an art work. My festschrift paper makes a number of further points that an interested reader may pursue, but the main one, which is the point of origin of this paper, concerns how Foerster often matches the form and the content in his writing. I believe this matter of matching form and content, in his papers, was of the utmost importance for Foerster.

Given the above arguments, it might be reasonable to expect that Foerster would have expressed further explicit interest in the arts.[4] It might also be thought that, if this is so, such interest might not be completely arbitrary. After all, we look for patterns to reduce the arbitrary in our experience.

Artistic Activity: Music

Looking through the list of Foerster's publications at the back of his own selection of key papers, *Understanding Understanding* (Foerster, 2003d), there seems at first to be little evidence in the titles of such an art interest. However, there are clearly three music based items.

The first is a paper, not yet published in English, entitled "Einführung in die 12-Ton-Musik."[5] Foerster and Schroeder (1993) discuss the music of Josef Matthais Hauer, technically and mathematically, also arguing for the music's asethetic value, placing it in a historical context and reporting on interviews and performances. Foerster was an enthusiast for Hauer (his record collection was the only collection I have seen that contained LPs [long playing records] of Hauer's music). The paper shows an awareness of contemporary classical music and a connection with at least one composer. It also contains a reprint of an early paper, "Von Pythagoras zu Josef Matthias Hauer" (Foerster, 1947), forgotten and brought back to Foerster's attention by Peter Weibel, which had been published, originally, in a rather obscure Journal called *Jedermann*. Hauer was the other inventor of twelve-tone music (along with Arnold Schoenberg), a form of music that uses all twelve notes of the chromatic scale equally, as opposed to the prioritised use of seven of the twelve notes that is the organising principle of classical, tonal music. Twelve-tone music liberated dissonance.

The last is a book, *Music by Computers*, edited by Foerster and James W. Beauchamp (1969), complete with recorded musical examples, which includes Foerster's (1969) article "Sounds and Music." Foerster's article, and possibly the conference on which the book is based, seem to have grown out of a lecture, "The Sound of Music: A History of Theories of Musical Sound," given to The History of

4. As I finished revising this paper, Foerster's son Thomas sent me an email (16.7.11) in which he wrote: "Heinz clearly was as much of an artist & craftsman as he was a scientist." Then, at the conference on Listening of the American Society for Cybernetics (9 to 15 August 2011), Foerster's former student Robert Martin reminded those present that Foerster encouraged the presence of the arts and artists at ASC conferences, as he did in the Biological Computer Laboratory.
5. My understanding of the paper is greatly enhanced by comments and notes shown me by the co-author, Paul Schroeder (28 May 2011), and Albert Mueller (30 May 2011), keeper of the Foerster archive. The paper was created through taped, spoken exchanges between Foerster and Schroeder, as was the paper, "On Natural Magic" which was its publication companion.

Science Society, University of Illinois, on 11th January 1966. The book clearly contains Foersterian touches, but there is now some dispute over his exact involvement.[6] In the mid 1960s, computer realised music raised new and exciting possibilities and the University of Illinois at Champaign-Urbana was at the forefront of developments.[7]

Some might add to this list of Foerster's expressions of interest in matters artistic, his development of the Aesthetical Imperative:

> If you desire to see, learn how to act.

This is the complement of the better known Ethical Imperative:

> Act always so as to increase the number of choices (see Foerster, 2003c).

However, this use of the term *aesthetic* is in line with a technical philosophical use, rather than the more general use that may be thought of as the theory of beauty in art.

Artistic Activity: Performance

Foerster was known for the remarkable quality of his lectures. These may properly be thought of as performances—without in any sense taking away from the power of the reasoning that these lectures presented. Foerster's aim was to make the argument more comprehensible and appealing by exploiting the art of the performer to bring people into his world and to carry them along in his story: He picked them up, like the zen monk carrying the woman across the river, and carried them along with him.

Foerster's performances had a feeling of improvisation. They came across as spontaneous and elegantly light-footed, responding to the moment. The ability to give this appearance to even the toughest and most profound of his arguments came from intense preparation. He would spend hours considering how he might present his argument, creating possibilities and backgrounds that allowed this improvisatory quality to shine. Improvisation is, of course, part of the nature of a conversation, and Foerster was deeply interested in dialogics, that is, in conversational modes. His son Thomas told me that even before a dinner party, Heinz would make (mental) notes about each guest, studying them so as to have a firm base from which to develop conversation. The art of Foerster's performances was based in improvisation growing out of this deep, rich knowledge that allowed the freedom to navigate this knowledge

6. Several of the comments here also originate in Albert Mueller's email of 30 May 2011,
7. For instance, Salvatore Martirano composed fiendishly difficult music for instruments and computer, culminating in the creation of his electronic music performance machine, the SalMar. Another person concerned with electronic and computer music at Illinois (and with a chapter in the book) was the composer Herbert Brün, for many years a close associate and friend of Foerster's, who also used computers to create graphics exhibited at the Cybernetic Serendipity show in London, 1968. As someone personally involved in the field, I was certainly aware of the work of the musicians in Champaign-Urbana.

in a manner that was of that moment, in much the way that jazz players spin vast improvisations together from a deep understandings and intuitions of the tunes from which they depart, married to a profound sensitivity to the audience, that is, their non-verbal conversational partner(s).

A performance is often taken to be a realisation of what someone else has written. Academics rarely have this luxury: They are their own script writers, their own composers, as well as their own directors, stage managers and so on. But performance has another aspect: we talk of the individual interpretation that performers bring to a role, for instance. The personality behind this interpretation, in the case of Foerster's lectures, was always visible, and always recognisable as Heinz. Improvisation makes sure that the performer's voice (interpretation) can be heard, just as that of the audience can be recognised and reacted to—provided (as I find this more and more) that it is improvisation based on sound preparation.

Artistic Activity: Design

Now we turn to Foerster's activities as a designer. These are neither well known, nor well documented. Yet, Foerster was very interested in design. Those who are lucky enough to have BCL (Biological Computer Laboratory) reprint copies of his papers will often find they come with a carefully considered cover that is certainly not the publisher's! These were designed by Foerster himself—with the typical obsession for finish and quality so typical of designers—as were a typeface he used for many official Biological Computer Laboratory reports and the many (often erotic) rubber stamps he designed and used. The diagrams and illustrations in his papers are also unusually clear and elegant. Many of these he provided himself, but on occasion he asked Gordon Pask, whose cartoon-like drawings are well known, to provide visual material. Less known is the contribution of the architect Lebbeus Woods. Woods was a fellow architecture student with Andreas von Foerster, Heinz and Mai's youngest son. His drawings of the nervous system can be found in, for instance, "On Constructing a Reality." This unremitting care is characteristic of designers.

Andreas also had a lead role in the making of Rattlesnake Hill, his parent's retirement home above Pescadero in California. As an architect with a particular interest in building his designs, Andreas worked with Heinz to both design and build the house that became such a landmark not just for the Foerster family, but for the many friends and colleagues both great and not so great who came to enjoy the famous Foerster hospitality, so genially offered without favour with the phrase "Mia casa, sua casa."

Rattlesnake Hill presents Heinz designing and Mai adorning and planting. It also provided a display space for Heinz's furniture designs.[8] It is clear that designing, and visual elegance, function and well-madeness, were important aspects of Foerster's life. He was a designer, and, from my point of view, while there are differences in the constraints that artists and designers accept, they are all makers of works that may be considered art.

Before I leave the area of design, there is one final point that should not go unmentioned. Foerster wrote exquisitely. He wrote with precision, with a feel for language, for flow and for form and pace, even—perhaps especially—in his adopted language (Foerster once told me of the first occasion he was invited to write in German, after moving to the USA. Thinking what a pleasure it would be to write in his mother tongue, he reported it had, in fact, turned out to be impossible, and he wrote the paper in English, translating it to German afterwards). He wrote as someone caring for language, its beauty and precision, an author with art in his craft and craft in his art. In his use of English, he learnt this in large part from Margaret Mead through the editing of the proceedings of the Macy Conferences, and Cornelia Bessie (2003).[9] But the origin must be the writing of Ludwig Wittgenstein (1961) in the Tractatus, which Thomas von Foerster (2009) reports Heinz told him, on many occasions, "blew him away"with the clarity of its reasoning and writing.[10]

Wittgenstein's Vienna

I believe the above indicates that there is in Foerster's work an unacknowledged artistic streak that runs very deep: Not only did art matter to him, but he acted as an artist in his cybernetic work.

I have always wondered how this came about. I have phrased the question in different ways. For instance, starting from the Viennese upbringing, I have asked why he did not become an artist? But the phrasing I have finally come to, in order to write this paper, the phrasing that allows me to make what I believe is a cogent case, is (once I have established a "hidden" artistic streak) where does it come from? For it is not so usual that a physicist who becomes a cybernetician acts in a manner that might be thought of as an artist's manner. There have been few in cybernetics, until recently, who came from the arts. Those of Foerster's era who have claimed an artistic streak (specifically Gordon Pask and Stafford Beer) are in a tiny minority when compared with the mathematicians, engineers and managers who populate this field.

In order to at least sketch an answer, I shall begin by introducing a similar argument made by Janik and Toulmin (1973) about Wittgenstein. The argument is not exactly the same, for I do not seek to bring together and explain two differing accounts of Foerster's work, as Janik and Toulmin do in *Wittgenstein's Vienna*; I wish to reveal and promote a hidden quality or persona. Nevertheless, in insisting on the importance

8. According to Thomas von Foerster (email, 15 July 2011) Heinz designed much of the furniture at Rattlesnake Hill (and in all the houses the family lived in), including the elegant elliptical dining table and the kidney-shaped coffee table in the living room. He commissioned the closet door in the bedroom originally for his study in Champaign from Bill Wegman, with the instructions that the sliding doors had to look good in any permutation so that one would not have to close them the same way each time.
9. Cornelia Bessie was the (school) girl across the hall who taught Foerster English in return for tutorials in mathematics and physics.
10. Incidentally, when he examined my PhD, he corrected my native English speaker's English, and he was right. The quality and appropriateness of language mattered enormously to him.

of those questions that were current in the culture in which both Foerster and Wittgenstein grew up (the questions of the *Zeitgeist*), we follow a similar pursuit.

Janik and Toulmin's initial observation is that the philosophy of Ludwig Wittgenstein, seen as philosophy of language in the English speaking world, is assessed completely differently in Vienna, where it is understood as philosophy of ethics.[11] Their attempt is to show how the social culture of Vienna at the end of the Hapsburg Empire was preoccupied with ethical questions, and that a deep immersion in such questions was unavoidable to the artists and intelligentsia, which Wittgenstein's family belonged to. The equivalent point in the case of Foerster's work, is that it is considered as cybernetics on the one hand, but may also often be considered (I argue) as art, on the other.

The first thing to realise about the Vienna of this time (claim Janik and Toulmin, 1973) is that the Empire was highly centralised on Vienna (and, to a lesser extent, Budapest) and that, within Vienna, "anyone who was anyone" knew all the other anyones. Janik and Toulmin point out the difference between this situation and that which many of us know nowadays, when life is often much less centralised and when education is much more widely available. It is, they suggest, hard for a contemporary US student (for instance) to imagine how Vienna was: their experience is of a much wider franchise and of geographic dispersal, and no one would know where to go to find "anyone who was anyone." They have little contact with a cultural village—such as Vienna was.

The English colloquialism, *anyone who was anyone*, should here be taken to mean the aristocracy, the industrialists, the artists, performers and scientists, and the intellectuals of Vienna. Many were related and affairs between them were also common. The siloing of this society into groups that were exclusive and which only talked about their particularised interest had not (yet) become the norm. The great, youthful, lyric poet Hugo von Hofmannstal went, for instance, to the lectures of Ernst Mach, perhaps the outstanding physicist of his time, who developed a view of the nature and practice of science that was enormously influential. According to Janik and Toulmin, philosophy scarcely existed as a separate, academic discipline: The questions we now call philosophical were, in fact, the questions that the well educated and privileged raised over tea and in the cafes. Thus, thinking from poetry and from physics could be discussed at the same coffee table in the same conversation.

Janik and Toulmin's *Wittgenstein's Vienna* paints a very thorough picture of this society, its concerns and modes of discussion and how this can be seen especially in Wittgenstein's *Tractatus* (1961). Their picture is a picture of the questions, and the attitudes to these questions that concerned this society. They argue these were essentially ethical, and that it was in this questioning culture that Wittgenstein's thinking was formed. They also argue that his response to the ethical questions that surrounded him was essentially formed by his training as an engineer and, therefore,

11. This may bring to mind Foerster's own interest in ethics, coupled to his scathing rejection of morals and moralising. I mentioned his Ethical Imperative earlier.

also as a physicist. I will not pursue (and abbreviate) their argument further. The key point for this paper is the link they establish between aspects of a Viennese background at the start of the 20th century, and the questions (and answers) that pre-occupied these people, which formed the intellectual background in which Ludwig Wittgenstein's thinking developed.

~~Wittgenstein's~~ Foerster's Vienna

Foerster also grew up in Vienna, in part during the period when Wittgenstein was growing up.[12] In fact, Wittgenstein was a family friend and distant relative of the Foerster's, close enough (as we have seen) for Heinz to refer to Ludwig as "Onkel."[13] Foerster liked to tell a tale of sitting under the table as 10 year old when Wittgenstein was round for tea (or, possibly, coffee and cakes at a Viennese Jause) one day. Wittgenstein asked Foerster what he would like to be when he grew up, and Foerster replied immediately "a physicist," to which Wittgenstein responded that this was a very hard task.

The Wittgensteins wealth came from steel manufacture. One of Ludwig's brothers was Paul Wittgenstein, a concert pianist who lost an arm in the First World War, but continued to play one handed. He commissioned Ravel's "Concerto for the Left Hand" (c. 1929-1930).

Thus, this friendship between the families, taken on its own, brought music, performance and deep questioning into Foerster's experience.

The family Heinz von Foerster created with Mai was an artistic family. In the first instance, Mai Sturmer was herself a distinguished actress. Then, Andreas, the youngest of their three boys, became and still is a distinguished West Coast architect with a strong interest in design-and-build. This has already been noted in regard to Rattlesnake Hill. One grandchild, Madeline, is a well known West Coast artist. Heinz's brother, Uzzi (Ulrich) was Vienna's outstanding jazz musician and club owner, the only jazz musician to have a street named after him in Vienna. Uzzi was 20 years younger than Heinz. Heinz, when growing up, created a brother-like relationship with his first cousin, Martin Lang. Together they became magicians and were admitted to the Vienna Magic circle as well as forming a jazz band, The Fölag Boys, that became a framework in which they performed their magic. Here we find an early instance of Heinz-the-performer. Martin became a distinguished actor, then diplomat. His daughter, Nina, until recently ran an interesting art gallery as a sideline to her studies of Mongolian culture.

The Foerster family was well known and successful, especially in the arts. Working backwards, we have Heinz's father, Emil (an electrical engineer) married to Lilith. Emil had wanted to be an architect, but was prevented by his architect father, Emil (senior), who announced that all important buildings had been built—by himself.

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12. The age difference between the two was 22 years. Wittgenstein was born in 1889, Foerster in 1911.
13. This use of Uncle is similar to the English usage as a term given to an older, close family friend who is not actually a relative. I had several of them. Wittgenstein was also, a remote relative by marriage.

Emil senior's father, Ludwig Foerster (who was honoured, becoming Ritter von Foerster), was also an architect, a leading member of the team that won the competition for the redevelopment of old Vienna, with his plan for the Ringstrasse and its ceremonial buildings. Ludwig's wife Marie was the daughter of a theatre director and a soprano of great distinction.

Lilith von Foerster, wife of Emil junior and mother of Heinz, attended art school with Oskar Kokoshka. Her brother Erwin Lang married Grete Wiesenthal, the great modernising influence in Austrian dance. Their son was the Martin Lang Heinz grew up with. Lilith became Grete's dresser, and, as children, Heinz and Martin spent much time backstage. Erwin's father was Edmund Lang, who married Marie Wisgrill. She had originally been married to the jeweller Theodor Köchert (and was Edmund's brother in law), who funded the composer Josef Matthias Hauer (about whom, as we have seen, Heinz wrote). Marie and Edmund were frequent hosts for a large group of artists and intellectuals, including Hugo von Hofmannsthal, the poet and librettist, mentioned earlier, architect Adolf Loos, and composer Hugo Wolf. Edmund's mother Ernestine was also a Hofmannsthal: Hugo was her cousin. Edmund's sister married Carl Wittgenstein, cousin of Ludwig.

This (abbreviated) listing is developed from a small private publication entitled *Family Stories*, by Thomas von Foerster (2009), Heinz and Mai's second (physicist) son. The little book, as much autobiographical as about the earlier Foersters, starts with an extensive description of the family's origins, relations and friends, and includes a very complex genealogical tree in several parts. The complexity of this tree reflects the complexity of relationships, marriages and affairs in Vienna during the time covered by *Wittgenstein's Vienna*.

The point of this list is to convince that Heinz von Foerster did indeed grow up surrounded by artists, and that his sample of Wittgenstein's Vienna and the Vienna that followed it up to the Second World War was truly tilted towards the arts. Of course, it would be foolish to pretend that this should mean that Foerster would of necessity become an artist. He did not. But the point is, he was surrounded by what one might think of as artistic sensibility, and just as his Onkel Ludwig Wittgenstein responded, as so convincingly argued by Janik and Toulmin, to the preoccupations of those surrounding him in Wittgenstein's Vienna, Foerster may be though of as reacting to his surroundings, in the as-yet-unwritten book, *Foerster's Vienna*. I write this paper as a challenge to someone, better qualified than I, to write it. For me, the question that continues to demand my attention, is why was Foerster chose not to become an artist, but fed his artistic impulse in great part by using his work as scientist to create a strange form of art. This is to be decided.

Last Words

I have deliberately left what may be seen as the most telling evidence, the evidence that seals the case to last.

In 1976, at the 80th birthday celebrations for Jean Piaget, Foerster (2003b) presented a paper, "Objects: Tokens for (Eigen-) Behaviours." In this paper Foerster introduces the strange world of eigen objects into his universe. Eigen objects embody eigen behaviours: the behaviour generates the object, the object houses the behaviour. These are mathematical objects that use recursion to generate a value that, no matter what value you start with, will eventually end up with a unique value that will then reproduce (itself). An example he gives is of the operation take a number as an input number, divide it by two, add one to the result, and recycle this result as the new input number. This little recursive process will always lead eventually to the number 2, which recycles itself in a process of eternal regeneration. Foerster offers this as a metaphor, perhaps a model, for the process by which human cognition takes the stream of experience and converts it into what Piaget, in what I believe is his greatest insight, calls Objects, which appear to have constancy, and which we chose to locate in an external world. Eigen objects and behaviours[14] have been a source of interest and argument. What I think is clear, however, is that in them Form is Content and Content is Form indistinguishably in a very strong form of reflection. Thus, my paper, like its source in Foerster's Notes on an Epistemology for Living Things, comes full cycle.

Let me end with a final thought. After the Second World War, Foerster made part of his living working for a US funded radio station, Rot-Weiss-Rot (red-white-red) in Vienna. Known as Dr. Heinrich, his show "Open for Discussion" (Es steht zur Debatte) was itself a re-creating of the cultural world on Wittgenstein's Vienna, in which science and art, and philosophy and politics, were, as Janik and Toulmin argue, the fluid and fluent subjects of discussion amongst the intelligentsia and the cultured in Vienna. The show consisted of debate and interview on topics from science, ethics, politics and philosophy. Was Foerster recreating Wittgenstein's/Foerster's Vienna?

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References

Bessie, C. (2003). The man in the room across the hall. *Cybernetics & Human Knowing, 10* (3-4), 197–201.

Foerster, H. v. (1969). Sounds and music. In H. von Foerster, J. W. Bauchamp, *Music by computers* (pp. 3-10). New York: John Wiley.

Foerster, H. v. (1993). Von Pythagoras zu Josef Matthias Hauer. In *Kybernethik* (pp. 54–59). Berlin: Merve.

Foerster, H. v. (2003a). Notes on an epistemology for living Things. In *Understanding understanding* (pp. 247–260). New York: Springer

Foerster, H. v. (2003b). Objects, tokens for eigen behaviours. In *Understanding understanding* (pp. 261–272). New York: Springer

Foerster, H. v. (2003c). On constructing a reality. In *Understanding understanding* (pp. 211–228). New York: Springer

14. There is also a more than passing similarity to the *Objects, and their behaviours* and *Behaviours* of my PhD.

Foerster, H. v. (2003d), *Understanding understanding*. New York: Springer.
Foerster, H. v., & Bauchamp, J. W. (1969). *Music by computers*. New York: John Wiley.
Foerster, H. v., & Schröder, P. (1993). Einführung in die 12-Ton-Musik. In Foerster, H. v. (Ed.), *Kybernethik* (pp. 40–54). Berlin: Merve.
Foerster, T. v. (2009), *Family stories*. Privately published.
Glanville, R. (1975), A cybernetic development of theories of epistemology and observation, with reference to space and time, as seen in architecture. Unpublished doctoral disseration. Brunel University, Uxbridge. (Online archive: http://www.scribd.com/share/upload/16199198/kqf86sjujgzq19w6220)
Glanville, R. (1996a). Heinz von Foerster, a Festschrift [Special issue]. *Systems Research*, *13* (3).
Glanville, R. (1996b). Heinz von Foerster: The form and the content. In Glanville, R. (Ed.), Heinz von Foerster, a Festschrift [Special issue]. *Systems Research*, *13* (3), 271–278.
Janik, A., & Toulmin, S. (1973). *Wittgenstein's Vienna*. New York: Simon and Schuster.
Wittgenstein, L. (1961). *Tractatus Logico-Philosophicus* (D. Pears & B. McGuinness, Trans.). London: Routledge and Kegan Paul.