Doctor Faustus and the Universal Machine

Zoe Beloff - October 1998

1938, the date that Stein wrote DOCTOR FAUSTUS , was a time of transition between the old analog world and the birth of the digital realm and it is this transition that I wanted to be reflected in the work itself in the sense of both finding a contemporary formal equivalent in digital media for the radical restructuring of language performed by Stein's text, as well as a playful philosophical investigation of the relationship between electricity, logic and language games that her work inspires.

My desire was to use the play as a starting point to provoke questions concerning how we think about our mental space within the real world in relation to the virtual machines which we more and more substitute in its place.

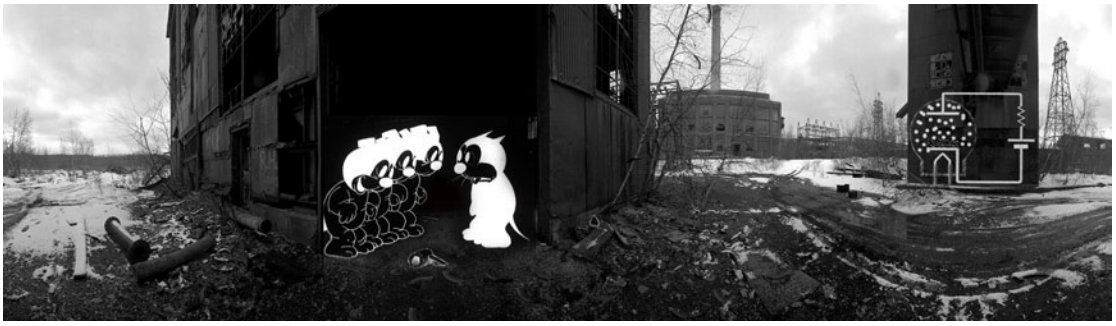
As Stein states in the work, her Doctor Faustus sold his soul, only to discover he had no soul to sell. It is here that we discover the great changes in perception of what it means to be human, that went hand in hand with the development of technology, mid-century. Man had, in short, become an automata who just didn't know it.

My first questions was of course, who is Doctor Faustus? All we know is he discovers the secret of electric light and he has a dog that says only, "Thank you". Perhaps he was really Doctor I.P. Pavlov who had conditioned this reflex in his dog? But then I asked, what could the relationship between electricity and conditioned reflexes possibly be? I discovered how conditioning revolves around very simple binary opposition. A stimulus is either "on" or "off" just like the circuit of a computer.

A whole new way of thinking about thought was coming into being based around "Truth Tables" or "Boolean Algebra". It was these ideas, in the work of the mathematician Alan Turing which were to lead not only to the very existence of "Universal Turing Machines", or as we now call them, computers, but also to the concept of artificial intelligence. Turing believed that the binary configuration of electrical circuits, (on = one = true) or (off = zero = false) could lead to thinking machines or "electric brains".

Even when computers were in an embryonic stage, Turing compared his instruction tables to "states of mind" [1]. He, like Faustus, who asks, "I have made it but have I a soul to pay for it", was searching to understand the paradox of determinism and free will.

Pavlov believed that all diseases of the mind could be explained by "The Ultra Paradoxical Phase"[2], the



confusion of ideas of the opposite. Indeed this opposition is the climax of the play, as Mephisto repeats, "You have deceived me and I am never deceived". At the same Stein wrote the text an almost identical statement was being analyzed by Ludwig Wittgenstein in his discussion of the "Liar Paradox". [3]

But while Wittgenstein maintained that mathematics was fundamentally just another kind of grammar, with no more truth to its structure than the structure of language can be said to be true, Turing, who was one of his students argued fiercely that the beauty of mathematics lay precisely in its power to provide, in an otherwise uncertain world, unassailable truths. It is here that a central conflict in philosophical thought opened up analogous to that which the play proposes between the Devil and Faust. Indeed as his biographer Ray Monk puts it, "the 'charm' exerted by the metaphysics of mathematics and the idolization of science was to Wittgenstein's mind the most significant symptom of the decay of our culture.

Turing believed that the mind could be encoded mathematically, that an electric brain was theoretically quite possible, Wittgenstein thought just the opposite that it was a logical impossibility, a linguistic absurdity, as he stated clearly in the "Blue Book", "The trouble is rather the sentence, " A machine thinks (perceives, wishes)": seems somehow nonsensical. It is as though we had asked, "Has the number 3 a color?" [4]

Though Stein was clearly fascinated by language and logic, I'm not suggesting that she was aware of these discussions that were going on in Cambridge. Rather I was interested in layering these ideas over each other, in hope that they might illuminate each other in productive ways.

The deeper I got into the text, the more clearly I saw that the content was the least important surface layer. Perhaps for this reason Stein choose the well known Faust myth, in the same way Cubist painters used simple still life objects as the starting point for a very radical investigation of form in space. Similarly Stein uses an extremely limited vocabulary, that is continually recombined logically.

Where is there nobody says nobody is there. Somebody is there and nobody says that somebody is not there. Somebody somebody is there somebody somebody is there somebody somebody somebody says there is where where is it where is it where here is here here is there somebody somebody says where is where. [5]

Language become opaque. It becomes the world. Just as Wittgenstein wrote in the Tractatus, " The facts in logical space are the world". [6]. Thus my desire became to work with Stein's text not as a story but as a set of logical operations or "Application", within which I can "input" my own "data". Thus in my version Doctor Faustus can be substituted by Pavlov or Turing, Mephisto can become Wittgenstein in his role as devil's advocate. And the Wooster Group actors can become Turing Machines who "output" the text in the form of

advocate. And the Wooster Group actors can become Turing Machines who "output" the text in the form of printed paper tapes that issue from their mouths. [7]

I became interested in creating a kind of digital Cubism; superimposing the abstract over the real, the digital over the analog. Re-photographing with a digital camera, old films such as; a Soviet film from the 1930's on Pavlov, early General Electric films on electricity as well the Krazy Kat cartoons that Stein loved. While at the same time, layering over these films, my own footage of the actors performing simple mechanical actions as though they were indeed nothing more than "electric brains".

My project does not describe or illustrate these ideas but attempts to very literally show them at work within the structure of the CD-ROM. My idea was to demonstrate that within the world I create, what appears as the most realistic is in fact only the most sophisticated level of artifice. Using QuickTime Virtual Reality Panoramas and QuickTime movies, I attempted to find a visual equivalent of the transition from 19th century industrial mechanics to 20th century computer architecture.

Texts from DOCTOR FAUSTUS LIGHTS THE LIGHTS are spelled out above the panoramas become controlling mechanism like Tapes of Turing's Universal machine, his "super-typewriter". Each time a word of the text is rewritten the panorama moves thus giving the impression that the world is structured by the recombination of language, creating an interactive experience that is both within the viewers control yet goes beyond it, suggesting that the visible world is now nothing but an interface and behind it lies the logical structure of programming, a text that controls.

Several decades later, Pychon would write of his heroine, in the closing lines of The Crying of Lot 49, " it was now like walking among matrices of a great digital computer, the zeros and ones twinned above, hanging like balanced mobiles right and left, ahead, thick, maybe endless. Behind the hieroglyphic streets there would either be a transcendent meaning, or only the earth." [8] But it was Stein who first gave poetic form to these very hierogphic streets at the edge of an unknowable void of binary opposition, as her heroine, Marguerite Ida and Helena Annabel sings:

> You do or you do not You are or you are not I am there is no not But you you you You are as you are not

This opens up the central question that I want to provoke, is the world a game? Today when we take computer games for granted, what are the implications? Stein's text might almost be a prescription for moves on a metaphysical game board. Wittgenstein maintained that mathematics was really nothing but a game, without real life consequences while Turing argued with him that mathematical contradictions could have

very real consequences in the world.

Significantly, only a couple of years later, as world war swept across Europe, while Stein hid in the French countryside mapping out her poetic language games, across the Channel, Alan Turing would play his own mathematical language games, cracking the codes of the German Enigma Machines. In his own way changing the course of history.

My project begins with a true story of Wittgenstein's escape into a cinema to drug himself with film and forget the philosophical problems that exhausted and tormented him. But as in all dreams, the repressed returns. And it is these hidden conflicts, the ones that are repressed below the surface of the play that I wish to bring to light.

This is a work can only be realized through the computer, its form is also its content. Interactive cinema is itself an emerging media. Its language is in the process of being invented . This is my ongoing project. Doctor Faustus is just one starting point, a tool to give the viewer space to think about what it means to conceptualize the transformation of the world into digital form.

1.Turing came up with the concept of the universal machine one that could imitate the work of any machine in 1935, long before it was practically possible to build one. Andrew Hodges points out that he immediately grasped its wider theoretical significance in relation to artificial intelligence. "We may now construct a machine," Alan wrote, "to do the work of this human computer". The drift of his argument, indeed, was obvious, with each "state of mind of the human computer being represented by a configuration of the corresponding machine." Hodges, Andrew. Alan Turing, the enigma. (London: Vintage, 1983.) p 106.

2.Pavlov, Ivan P. Lectures on Conditioned Reflexes. (International Publishers, 1963.)

3.In the case of the Liar Paradox, Wittgenstein suggested, "It is very queer in a way that this should have puzzled anyone much more extraordinary than you might think: that this should be the things to worry human beings. Because the thing works like this: if a man says 'I am lying' we say that it follows that he is not lying from which it follow that he is lying and so on. We, so what? you can go on like that until you are black in the face. Why not? It doesn't matter".

Quoted in : Monk, Ray. Ludwig Wittgenstein, The Duty of Genius. (Penguin Books 1990) p 420.

Some might argue that Stein does tease out such paradoxes until the audience is "black in the face".

4.Wittgenstein, Ludwig. The Blue and Brown Books. (New York: Harper Torchbooks, 1965) p 47.

5.Stein, Gertrude. Geography and Plays. (Something Else Press, 1968) p 98.

6.Wittgenstein, Ludwig. Tractatus Logico-Philosophicus. (London: Routledge 1974) p 5.

7.Turing imagined his Universal machine working with just one line of writing. In his picture the typing point of this super-typewriter could progress indefinitely to left or right, the supply of paper being infinite.

8.Pynchon, Thomas. The Crying of Lot 49. (New York, Harper and Row, 1986) p 181.