

THE MAGNETIC MIRROR

BY KEN FEINGOLD

Preface

Here is the central thought, right from the start—the underlying theme of technology is that we are trying to recreate ourselves, to make idealized versions of ourselves, versions which are in some ways “better” than we are, but like us, and able to communicate with us in our search for the self, for knowledge.

And what we see in images is that we see them, whatever they may be—in other words, we make images which are objects that we can see so that we see them, to think and talk and dream about seeing.

Dreams are the very first place that we notice the independent existence of images, because we learn, more or less simultaneously, that dreams are not *real*, and, therefore, that the images of our dreams are also not real. But it is with much greater difficulty that we learn later that pictures are not real (or, if they are real, that they are real only as *pictures*) and many whose lives are wrapped up in image making still believe in the reality of their images.

The Shadow World

We live in an analog world, a world of physical stuff, modulated by the waves and pulsations of analog phenomena such as time, space, light, matter, and gravity. Until the 1950s, the images that we made of this world were of the same analog stuff as the world itself—charcoal, paint, various mechanical and chemical processes. The digital world is one we have created to mirror the other. It consists of electrical flows, stops and starts, samplings, areas of magnetism—*analog stuff*. With these things passing through very analog matter, such as silicon, copper, glass, and rust, people have learned to make a pseudo-world, one which exists only through our transformation of these flows into something which is, for a brief moment, digital (or for longer when it is stored into what we have called, again as a reflection of ourselves, “memory”), and then again analog, for it has to be that for us to see it. This idea of the “digital” is the method by which these pulses, which are themselves analog, address specific pieces of hardware through simple on-off (or 0 and 1) messages. So we have, in these last forty or so years,

learned to create technologies and languages for this coming and going between the visible and the invisible. And if, in that sentence alone, you hear a metaphor for a greater searching, it is no accident.

Let's say we begin with the concept of representation. I think it is fair to say that image making is centered on representation, whether a literal representation in the form of an image-object that appears to us in a form similar to the form from which it was derived, or a representation of some more elusive type, such as those we speak about as "representing our ideas" or "representing our feelings." Let's clarify the context in which we utilize this term. How can one believe that a painting of a landscape, or a portrait, or a photograph taken of the street outside my window, for example, represents the world in some way? Or that an image of an abstract form *represents* a conceptual abstraction? Here we have to uncover some assumptions, or I, at least, have to speak of some of my assumptions.

I want to present as a grounding idea that we do not know what objectivity could possibly be.

Is there a person who can say that he or she really knows that what they sense is, in some fundamental way, "true" to the thing itself? Have not these thousands of years of doing philosophy been enough to show us that if we cannot know the world directly for more than a fragment of a moment (*and this knowledge which is continually escaping is what I take objectivity to mean*), then what we speak about, when we speak about an object, is what we perceive through our senses?

I think we should admit as senses not only the usual Western five (sight, hearing, touch, smell, taste), but also one other, a given in Buddhist philosophy, the mental sense. What is perceived by the mental sense? Simply, the activities of the mind. But if you are looking for evidence that such a sense exists, just think about the concept we invoke when we say "me" or "I." What is it that is not the "me" or "I" which knows that this other one exists? This is a part of what we call the mental sense. It is here that we locate the first layer of representation—mental representation. The sense of, say, sight, does not perceive anything. In fact, even what we call *seeing* has been turned into an activity. What is it which is seen by seeing? That is, what do we have for a *thing* in our experience of sight, without the intentionality of *looking*? The image that we have in our mind is the representation of the mental sense arising upon the moment of seeing. This first moment of seeing, becoming then a moment of the sensation of seeing, gives rise to what we think of as a *natural* image. The sense has with it the power of its ability to present to the mental sense a form for representation, but it is, itself, in those first moments, simply phenomena. On what basis can we say that this thing we call our perceived image is as real as the objective thing? In a circular, tautological way, we say it is objective because this is how we see it. It is the

way it is because we see it the way we see it.

Aberrant types of vision—nearsightedness, astigmatism, etc.—are to be *corrected* toward a norm we establish based on a consensus of beings whose organs function in a similar way. (*Optics—the technology of the eye device...*)

Language: The First Technology of Representation

We have, at the beginning of our history of our technology, this first entanglement—the thing (which we imagine to have an actuality), the mental representation of the thing (coming to us, say, through the mental sense arising upon this sight), and our need to somehow create a continuity of these sensations, to make some sense of these things in relation to that other mental sense—the sense of something we call "me" or "I." Upon this sense we create the first technology—language, and its basis is one of representation. The name represents the image (as well as that which comes through the other sense powers—the physical sensations of the object), which represents the sensation that represents the thing.

Language is a technology of representation conceived also for the purpose of communicating our navigations amongst constructions of thing-identities, self-identities, other-being identities, and mental representations of the conceptual relations we create from these, and somewhere along the line, something we call *meaning*. Upon these constructions, we create narrative, ideology, history, frames of reference. And we find nested within this the proto-technology of time construction. Again, can we construct a thought that allows us to believe that our sense of time has something to do with what might be time-without-person, or time itself? Again, the problem of understanding even a single moment of objectivity. So here sensation and the mental constructions—image, subjective time perception, a perceived continuity of the self—work together with the first technology, language, to undertake this immense project of representation. And if language seems to be a side issue, let me say that it is precisely here that we arrive at the central subject of computer imaging, which is that all of these images, systems for making them, and the guts of the machines we use to make and see them are based on writing, on language.

So you have to know what an image is, what kind of an image you're after, and write an algorithm that will take this kind of data and turn it into this kind of image.

Descartes was tortured by an inability to affirm the knowledge attained through the senses. He imagined the concept of what we call the Cartesian Coordinate System, a fundamental form of our representation of mathematical abstractions, while lying in bed, watching a spider crawl along cracks in the ceiling, in a fever delirium.

Coming and Going

This realm of computer imaging is always a coming and going, back and forth, between the analog and the digital. When we speak of computer languages, we are not speaking metaphorically. These images of which we speak do not have a physical existence—they are described, in languages, within databases, or dataspace, if you like. When we see an image on a computer screen, we are seeing a manifestation of language translated into electrical energy, as glowing phosphors. The digital domain is essentially a linguistic one. There is no such thing as a digital image; it is a contradiction in terms. Images are always analog. They may be created by digital means, but they are, by definition, analog. There are no digital images. This phrase is just a way of speaking. Digital information is language, and the electronic devices translate this language into things we can see. What you see on your computer screen has no physical existence. It is a succession of magnetic pulses triggering passing moments of glowing phosphors, glowing and fading, lined up in row after row, fading and dimming, and never all illuminated all at once, over and over.

The natural states of magnetic media such as tape, hard drives, floppy disks, and of circuitry like the computer, the audio amplifier, the video-screen image are snow, noise, randomness. We use these written formulas to organize these things to reflect how we perceive, how we conceptualize, how we imagine ourselves.

The Invisible

Recently, another effect has been introduced called *visualization*. In this procedure, that which does not have any visual form in the world exists as a set of conceptual relationships, such as mathematical formulas or data of various types, can be made visual, so that we can see what was previously not something to look at, and thereby bring it into that part of our conceptual and analytical experience that arises particularly from the ways in which we think through and learn from the senses arising from vision.

Not long ago in the *New York Times*, there was a photo of a Black Hole. Of course, if you understand what a Black Hole is, you know that one could not possibly photograph it, as it absorbs all light that falls into it. So what was the photo? It was a form of this new type of image making called *visualization*. Data about the gravitational phenomena around this place in space was translated, by means of algorithms, into image. The example is meant to point out the notion of an image of something invisible made visible, and the algorithm is the law which governs it in a fundamental, formal way, and determines by its laws

what the image will look like, what kind of an image it is.

In programming, we write *codes* and *scripts*, in particular computer languages. We address what are called *libraries* within the operating system in use (and this use of the word *libraries* might remind us how deeply involved in language this whole business really is), and that one translates into an even lower-level language that addresses the hardware of the machine, finally down to a purely binary language of zeros and ones—binary machine language.

The arrow or cursor you see on the screen when you move the mouse or touch the keys does not exist, except as we guide the computer through this cycle of linguistic transformations. Your move of the mouse, your click on it, generates electrical pulses, which are compared to reference voltages and internal clocks, which are translated into codes, which address libraries of commands and functions (all written at another time in another place by someone else), on down the line, until they make their way back up the stream to where the last voltages are translated into those addressing the display, the screen, and manifest as an arrow or cursor.

Here is the fascination for speed—there are many things happening in these circuits—and these are actually called *reading* and *writing*, *sending messages to addresses*, *reading look-up tables*, and *referencing*. The least interruption of this flow makes these pathways apparent. If you have to wait, the spell is broken. One of the most important developments in recent years has been the increase in the operating speeds of computer systems, allowing very complex calculations and many millions of zeros to be moved around the system in what we call *real time*—that is, time as we experience it in our own lifeworld.

Cartoon Characters

An experimental film shown a few years back had Humphrey Bogart and Marilyn Monroe playing a scene together in Toronto. They, of course, never did this at all. And as the technology improves its simulation of human eyesight, we will no longer be able to distinguish a visual difference between fact and fiction. Actors will not have to actually act in films, but simply license their appearance and voice, if the human original is even needed at all. I suppose that it will remain desirable to have some actual person walking around, in order that we can actually see them in the world and have some real gossip about them. But computer-generated actors will become more the norm. As we have come to know about the lives and personalities of Mickey and Minnie Mouse, Popeye, Akira, and other cartoon characters, human simulacra on the screen, indistinguishable from people, will become a large part of the entertainment world. The “Max Headroom” character was absolutely visionary.

Who needs a real newscaster? Does anyone really believe that Dan Rather is a journalist more than he is an actor, a figure, representing narratives created by particular ideologies? Wasn't it clear to everyone that "Desert Storm" was a collaborative TV show of CNN and George Bush? Was it an accident that Wolf Blitzer was the CNN correspondent at the Pentagon?

So, once again, questions of power, law, ethics, and aesthetics may be buried beneath the law of the commercial product; the popularity of a commodity and its ability to generate revenues in the marketplace will supplant ideologies that put the well-being of actual people first.

Who will control, or try to take control, of the questions of image-ethics? Who has the moral authority to say what can be seen and shown to others? How can any group claim that they have the right to take images or books out of circulation or ban cinematic works? At this moment, religious fanatics in this country trying to impose their morality on everyone else are ripping apart our arts funding system, trying to dissolve Public Television, arresting image makers and the exhibitors of images. We are on the defensive because those who wish to limit the freedoms of others are always the first to invoke The Law.

Telepresence and Telerobotics:

The New Consumer Frontier, New Tools for Art

The Gulf War made it very clear how much the military depends on remote viewing technologies for its work these days, and these will eventually become consumer products, and tools for making art. We'll have video phones, video answering machines, and video wiretapping, and a whole realm of artwork will come out of these everyday kinds of images. So you'll be able to see live images of what's going on in rather distant places via cameras that you can manipulate in real time. This is already transforming archaeology and factory production. Cameras can be sent into tombs through tiny holes, ground-sensing radar can map buried layers of the earth's surface, and robots with attached cameras can, through complex programming of computers that control them, see what they are doing—or at least, do certain things when certain visual phenomena appear before their cameras. We *teach* the robots to act upon visual information as we would, though it means nothing to them whatsoever.

At the moment, we rely on live news coverage to show us live images of places at a distance, but this will change. We are already making our experiments with ISDN (Integrated Services Digital Network) lines (and we shouldn't forget all those early Slow-Scan TV works). It will be quite normal to have a video camera in your home that you can reach via a phone connection and walk around the house, or watch the babysitter watching

the kids, etc. And, because these are recordable images, there will be artworks made from these materials, too.

Now we have very communicative portable computers, able to receive information over radio waves, like cellular phones. So it won't be long before your video answering machine will be able to send you your video message over the airwaves. The video-fax will happen soon. In fact, as far as still imaging goes, it is already in everyday use by the wire services.

The next hurdle is what's called *force-feedback*, the connection between what you see and the physical sense of touch, so that when you grab something in a virtual space you'll feel it. These signals will of course also be transmitted; we'll have a new word, something like *teletactility*.

I recently heard that the wine industry in France has developed a smell-sensor for a computer. Eventually, any phenomenon can be studied and duplicated. Imagine, digitally generated smells, touches, tastes, along with our sight and sound, transmitted around the world, beamed out into the universe.

Psychic Pets: The Next Interfaces

Of course, we will eventually develop a way to generate images directly from imagination. We will be able to record and reproduce our subjectivity, and we will be able to synthesize it. (Douglas Trumbull's film *Brainstorm* went largely unnoticed as a prophecy of this as well as the struggles that will ensue between military and private uses of the technology. And what was it, in the end, that the central character was after? To experience death, to see the afterlife, to go to heaven...the same old mysteries...)

I believe that the interfaces for intra-subjective technology will be partly biological, partly electronic, and will develop once we come to understand and work with what we now call *extra sensory perception*. The only kink will continue to be that people will not agree on the ethics of the uses for these developing tools and products, and certain groups will limit others. What the structures of these limitations will be—state, business, or religious—and the means by which these institutions impose restrictions on the freedoms of others will remain, as always, linked to their technological/economic/military interests and powers.

Perhaps someday we'll actually make a person, or maybe we'll give up on the idea, I couldn't say. But maybe this person will have desires, too, and I wouldn't be too surprised if the first thing it wanted to do was to make some pictures.

Ken Feingold is an artist living in New York City.