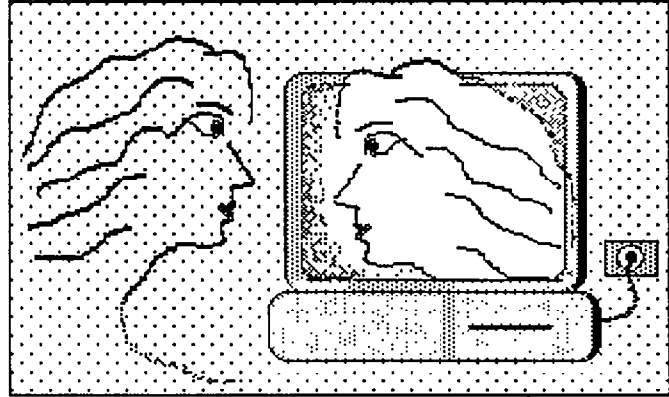# THINKING OF ONESELF AS A COMPUTER

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Sally Pryor
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I've been an enthusiastic computer artist/animator/programmer since the early 80's. I'm fascinated by the new forms of artistic expression, communication, simulation, extension of the senses and pleasure that are made possible by computer graphics/animation and concepts such as virtual space, interactivity, artificial intelligence and networking. As an ex-biochemist, I'm also hopeful about the potential of these areas to form a kind of a bridge between the arts and sciences, although this certainly will not happen overnight.

What I'd like to explore here is the somewhat disembodied landscape surrounding the human and the computer, a landscape in which the computer is increasingly used as the metaphor for the self. These interests arise directly from my experience last year of developing symptoms of Repetitive Strain Injury (RSI) - pain, heaviness and weakness in my right arm and hand.

1. The Human/Computer Connection

"If you neglect your body it will revenge itself by making you lose your mind"[1]

If you're a cerebral sort of person, the kind of person who is more involved with what's happening in your head than in your body, the computer gives you a way to be even more like that. Aside from your arms, hands, eyes and brain, it's almost a nuisance to have a body when you're working with a computer. It gets in the way of the mesmerizing interaction between the screen and your mind, unreasonably demanding food and attention -or that's how it seems, stiffening your back and shoulders when you just want to keep going and going.

One of my dreams was always to have a computer graphics studio at home. Now that I have this, there have been many times that I have completely ignored all bodily sensations during marathon computer sessions. The most squalid moment was probably being force-fed by my partner while still sitting in front of the screen!

The computer gives you a very seductive way to extend your abilities and senses - to produce slick-looking documents when you can hardly type at all, to recall and digest large amounts of information, to visualise mathematical formulae, to model scientific processes, etc etc. I find, as an artist, that I can make images that I couldn't or wouldn't consider using traditional media. It's also fascinating to envisage the new forms of art that are possible with computers: for example art that interacts with the viewer in a meaningful way. The art-object as unique, financially appreciating artefact is seriously threatened by these developments.

But despite the very real sensual pleasure I feel from the images I make, I can't help noticing how un-sensual computers and their interfaces are. The senses of smell, touch and taste are barely represented in the hard grey plastic boxes and input devices. An interesting exception to this trend is Allison Druin's "Noobie"[2], a huge furry creature that children squeeze and touch in order to communicate with the computer.

The kinaesthetic body, which is absent in the current computer interfaces that are based on keyboard or mouse, may well enter the picture when the concept of virtual space becomes readily available. Using body suits and gloves, you could move your whole body to interact with a synthetic world that you see in special glasses. In this way the computer could provide a kind of virtual prosthetic device for the body: for example you move your arms, and in your glasses you see a DNA helix being split apart by probes. The possibilities here are fantastic.

But what about when we use computers to communicate with each other? "Reach out and touch someone" intones the phone company and we scarcely stop to remember that we can't actually do that with a phone call. The same is true for communication through computer networks: text takes the place of person-to-person interaction.

Timothy Leary[3] says that we could use virtual space to do all sorts of things with each other, such as a game of tennis between people in two different locations. In fact he says, the only thing that would be difficult would be exchanging bodily fluids, a humorous remark which draws attention to the absence of direct corporeality which pervades the concept of virtual space. What does it mean that this concept has been so eagerly taken up recently in popular culture? And why are we so captivated by the idea of a process that bypasses direct information from most of our own bodily senses?

"I'd just been an artist-in-residence working on a project I really believed in: using computer graphics as a way to introduce girls and women to the computer. I'd run out of money and was working again as a commercial 3D computer animator, flying hi-tech logos that were all form and no content. My shoulders were hunched, my hands suspended tensely over the keyboard, ready to two-finger type another comand the second the previous one was completed. A few keys had to be bashed to make them function. In my spare time I made images, working intensely with the mouse grasped tightly in my right hand. To unwind I drowned myself in a sea of TV."

2. The Computer as Metaphor

"Computers are our symbol, our logo"[4]

Throughout history there's been an intimate relationship between the latest technological advances and the metaphor for the self. This is somewhat of a 'chicken and egg' relationship - it's hard to say which comes first, the technology or the view of ourselves.

The Greeks lived in a technology based on craft and likened man to a clay vessel. More recently, the advent of clocks enabled Rene Descartes in the 17th century to liken a sick man to a badly made clock. Since then machinery has been very much the metaphor for self. This is largely subconscious: people speak of being rusty or sharp, broken down, running on empty, etc etc.

Today, as the boundary blurs between technology and the body, people seem to be shifting almost unconsciously from this mechanical model of themselves to one based on the computer. I notice this initially amongst scientific and technical people. The computer metaphor is increasingly used to explain or model human biological processes: for example references to information supposedly 'hardwired' in DNA, to the idea that biological organisms are really information processing devices or that the mind is just a complex pattern of information in the brain. Actually the brain comes in for alot of these computer metaphors - it is sometimes referred to as wetware', often considered to function just like a computer. I have even heard references to the 'wiring diagram' of the brain.

Recently a computer programmer was telling me that he was feeling off-colour: "my software's OK but I think my hardware has problems". In Denmark a young man became psychotic with what was called a 'computer syndrome' after many 12-16 hour a day sessions at his computer[5]. Apparently he was hospitalised with insomnia and anxiety after he began to think in programming language, waking up in the middle of the night thinking "Line 10, go to the bathroom, Line 11 next". He told doctors "there is no difference between the computer and man".

While this last example may be extreme, I have caught myself jamming my finger, thinking "UNDO" and expecting this to happen. I know I'm not the only person to start thinking of myself as a computer.

"One morning I woke up and decided to do something about how increasingly tense my shoulders felt, so I arranged to have a massage. The masseur unlocked some of my frozen muscles and sent me to an osteopath, who, in the course of his work, commented that the tendons in my right arm were like those of a sheep shearer. Coming from a farming family, this comparison did not alarm me (actually I felt proud!) until he said that the reason shearers drink so much is that they are in so much pain. It was then that the pains, heaviness and weaknesses in my arms, wrists and hands were correlated with tendonitis; I paid attention when there was a

medical label. It enabled me to take sick leave from work and to permit myself to rest. I have not flown a commercial 3D logo since, I became a teacher instead."

3. Mind/Body Dualism

"Matter is a word, a noise....matter is spirit named"[6]

What does it mean to think of yourself as a computer? To me it seems to reflect the Cartesian mind/body dualism, with mind equating with software and body with hardware. To understand the mind/body dualism I will turn to the writing of Elizabeth Grosz[7]:

"With rare exceptions in the history of [Western] philosophy, the mind and body have been conceived in isolation from each other, functioning as binary or mutually exclusive terms. The attributes of one are seen as incompatible with those of the other. In, for example, Descartes' influential writings, the body is defined by its extension, that is its capacity to be located in, to occupy space. By contrast, the mind is considered as conceptual, based on Reason."

Thus the mind is considered conceptual and non-spatial; the body spatial and non-conceptual. "Subjectivity and personhood [is identified] with the conceptual side of the opposition while relegating the body to the status of an object, outside of and distinct from consciousness."

"This binary opposition is commonly associated with a number of other binary pairs: culture and nature, private and public, self and other, subject and object...Mind becomes associated with culture, reason, the subject and the self; while body is correlated with nature, the passions, the object and the other....Excluded from notions of subjectivity, personhood or identity, the body becomes an 'objective' observable entity, a thing...The fact that the body is the point of origin of a perspective, that it occupies a conceptual, social and cultural point of view cannot be explained on such a model"

"It is very difficult to get a clear understanding of tendonitis and RSI. The area is contraversial and heterogenous, Many claim that it is all in the mind and that there is no observable damage to the body, although the Lancet[8] has reported an Australian study where muscle biopsies of RSI sufferers showed striking abnormalities in both muscle tissue and cells. It's clear that emotions such as boredom and stress are intimately involved in the development of RSI, however bad ergonomic design and lack of regular movement also are very important. The trance state that seems all too easily to develop when using a computer freezes the body's postion and the blood can't flow freely to nourish tissues and remove waste products. Repetitve movements and (I suspect) alot of mouse action only make things worse."

4. An algorithm for the Self?

"Your body is a burden. It is simply meat"[9]

The mind/body dualism means that mind, equated with the self is considered conceptual and not spatial; body, equated with the other is considered spatial but not conceptual. Applying this to a computer metaphor for the self, we end up with the body as hardware and the mind as software.

What could this mean? To me it reflects the idea that one's subjectivity or sense of self could be reduced to software, to a set of instructions that could operate independently of the body. Understanding oneself would become a problem of coding, of finding the right algorithm. The body, being hardware, would be replaceable, possibly redundant.

This idea is seductive and has been taken up enthusiastically in various circles: most notably parts of the AI community, cyberpunk Sci Fi and increasingly, popular culture. "Your body is a burden" says a 'Cyber Dada Manifesto'[10], "it is simply meat....all physical and emotional feelings can be chemically simulated..be totally efficient...the end of the world is coming but it's the beginning of the perfect techno world" and so on.

Hans Moravec in his book 'Mind Children'[11] speaks of a post-biological world, where the human brain is freed from its mind (and body) and loaded into self-improving, thinking machines that he calls "mind children". He talks of our "uneasy truce between mind and body" and recommends that "human thought [be] released from bondage to a mortal body". The essence of himself, he says, is "the pattern and process going on in his head and body, not the machinery supporting that process..the rest is mere jelly".

'Jelly', 'meat': these are not terms that imply respect. The body seems to take the blame for all perception of vulnerability, need and mortality. "We have been taught to neglect, despise and violate our bodies and put all faith in our brains"[12]. The assumptions seem to be that the real you is the thoughts in your head, that if you can leave the body behind you will never have to feel pain again. If only this were true!

"I'd seen myself primarily as a brain attached to a stick figure - a kind of semi-intelligent robot. I thought my body's function was to carry my mind around; my arm's role was to execute my ideas. Food was just a fuel to keep the whole thing going. I felt beyond the body, superior to people caught up in what I privately called the 'Jane Fonda Syndrome': obsessively working out at the gym, dieting, sculpting, painting and improving their bodies so that they met the current standards of desirability. Sport seemed foolish too: just another way to be intensely competitive with others."

5. A Cork Bobbing in the Ocean

"He said I treated thoughts as If I generated them myself but In his view they were like animals In the forest"[13]

If the concept of an algorithmic self denies the body's role in subjectivity, what else could be omitted? To investigate this question I'll ignore the public/private dualism and look at Descartes' personal life.

In his early twenties, Descartes had a series of three dreams which changed the course of his life and of modern thought. In his sleep, the Angel of Truth appeared to him and, in a blinding revelation, revealed a secret that would "lay the foundations of a new method of understanding and a new and marvellous science"[14]. Descartes embarked on a quest to understand how the mind works, inventing analytical geometry so that a mathematical model could be derived. This task proved more difficult than he had anticipated and he never finished his treatise. But he also never returned to the source of his inspiration. His writings do not mention the role of dreams, revelations, insights as the foundations of thought. Instead he gave all his attention to formal, logical procedures that supposedly begin with zero.

So we're talking here about the unconscious. According to Jung as interpreted by Robert Gordon[15], "when we say 'I' we are referring only to that small sector of ourselves of which we are aware...Jung compared the ego, the conscious mind, to a cork bobbing in the enormous ocean of the unconscious...He concluded that the unconscious is the real source of all our human consciousness- our capacity for orderly thought, reasoning, human awareness and feeling... The disaster that has overtaken the modern world is the complete splitting off of the conscious mind from its roots in the unconscious. All the forms of interaction that nourished our ancestors- dream, vision, ritual and religious experience- are largely lost to us, dismissed by the moderm mind as primitive or superstitious."

An algorithm for the self could only include the parts of our ourselves of which we are aware - the conscious mind - and would have to omit the unconscious, an area we can barely grasp and certainly not directly. The unconscious expresses itself through the body and in symbols rather than in verbal or abstract forms.

You hear alot about the quest to develop artificial intelligence and almost nothing about developing (say) artificial dreams, compassion or imagination. This must be linked with the fact that "computers are at their worst trying to do things that are most natural to humans -seeing, hearing, manipulating objects, learning languages and commonsense reasoning....It is comparatively easy to make computers exhibit adult-level performance in solving problems on intelligence tests or playing checkers and difficult or impossible to give them the skills of a one-year-old when it comes to perception and mobility"[16].

"I've had an extremely naive attitude to my body. I've treated it like I treat my car: I do the minimum required to keep it on the road. The RSI experience frightened me because I realised how vulnerable it is and how many of the things I enjoy (like making art) require the use of my hands. Clearly my attitude has got to change. And it is, slowly, although I feel tremendous resistance to paying attention to the stories and secrets of my body. I've chosen a form of exercise, Middle Eastern Belly Dance, that intrigues me despite its appropriation by titillation. My mental interests are irrelevant in class, I get a fleeting glimpse of a completely new sense of myself moving fluidly through space. Of course I still don't practise between classes, I'm still more likely to read a book or watch TV. I've set up my computers now so I can use the mouse with my left hand. This works quite well but I hope it doesn't just mean I'll ruin that arm too."

6. Throwing the Body out with the Bath Water

" the cyborg is our ontology"[17]

What else might be the concept of an algorithmic self omit? To return to Elizabeth Grosz, "Patriarchal oppression justifies itself through the presumption that women, more than men, are tied to their fixed corporeality...[Women] are considered more natural and biologically governed, and less cultural, to be more object, and less subject than men. Women's circumscribed social existence is explained - or rather rationalised - in biological terms and thus rendered unchangeable[18]."

So the feminine is allocated to the other/body/emotions/object side of these dualisms and hence would implicitly be omitted from an algorithmic concept of the self.

For Descartes the body differs from material objects -including machines- only in its degree of complexity. Thus he links the body not only with the other, the animal and the passions but also with the machine. But aren't machines and emotions a bit incompatible?

To explore this tension I will return to Descartes' private life. He was very interested in automata and apparently possessed a mechanical doll or automaton named Francine[19], which probably used clockwork mechanisms to move and make sound. Very little is known about it/her except that it was named after (and possibly built to resemble) a well-documented illegitimate daughter from whom he was unhappily separated. Apparently the doll acted as a sort of travelling companion and met its end on a sea voyage when the ship's captain discovered it in a packing case and angrily threw it overboard.

So here's a clue: Mr 'I think therefore I am' in his private life linking the body, the machine and the emotions through an association with the female, specifically a female robot. I must admit that there is some doubt about whether this story about Francine is just an urban myth. But even if this is the case, as a metaphor the story is powerfully expressive.

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The modern equivalent to Francine in popular culture is the female cyborg: part organism, part computer. Very few representations of supposedly female cyborgs fail to fill me with alarm. A common image is of a Playboy-style woman's body and posture, rendered in the sleek perfection of chrome. I can't relate this image to my own experience of being female. A recent advertisement for computer graphics software consisted of such a cyborg, detailed breasts lovingly rendered in chrome, with the text, "I ROBOT. YOU BOSS."

One of my students, Carmel Kremmer[20], asked "Could it be that computers are being designed as silent, powerless, co-operative substitutes for women - in the workplace, in the home, in bed even? Automated companions who provide "the illusion of companionship without the demands of friendship."[21]?

Is this an extremist view? I don't know, but I do agree with this statement from the authors of 'Gender at Work' [22]: "Computing is in fact no more Uni-sex than Playboy....We have to be clear about what is going on at the symbolic level and speak out about it."

"I'm under pressure at the moment and very busy. I've even missed my regular dance classes. My right arm is particulary tired and my back aches. I now know several things I could do to help (such as going to a class, mental visualization exercises etc) but I'm so busy that I'm mostly ignoring it. Today I feel frustrated and ridiculous. I worked on this paper for four hours straight yesterday and now my back is very sore. I tell myself I will do the right thing and take breaks every 3/4 hr today: when I do I'm shocked at how fast the time goes. We make a big effort at the University to encourage students to be aware of ergonomics and taking frequent breaks from the computer. But I still see them hunched over their screens and keyboards, mesmerised, hours seeming like minutes. When I say something they sit up guiltily but I know that they don't believe it could happen to them. And why not, I didn't either."

7. Return of the Angel

"Data, data everywhere and not a thought to think"[23]

I've identified three areas of ourselves which would be omitted from the concept of an algorithmic self - the body, the unconscious and the feminine. I'm sure that these are intimately linked, I'm also sure that this list is incomplete. I know I have a blind spot, I just don't know where it is.

I've focused alot on Descartes because he is the defining man of our scientific and technological culture, the Cartesian coordinate system as it were. Leola Jacobs [24] postulates that the paradigm of technological knowledge assumes a rational, cartesian, sex-neutral and disembodied subjectivity. Could it be that the concept of the self as software provides the ultimate Cartesian, sex-neutral,

rational and disembodied subjectivity? Could it also be that the algorithmic self offers the ultimate refuge from animality, the unconscious and even the feminine? Perhaps it's appropriate that Time magazine named the computer "Man of the Year" for 1982?

For the reasons I've outlined, the concept of an algorithmic self frightens me. I think it's vital that we invite the body, Descartes' Angel and Francine back in from the cold and integrate them back into our conception of ourselves and into our model of the computer.

This is particularly important so that we do not just replicate and reproduce current values in the defining technology of the future. We need to be aware that computers are not a neutral tool, that they arise from and embody the values of a cultural and philosophical context. It's time to ask whether the computer reflects a discourse of disembodied and abstract reality, a discourse of power and control over the other, the object, the emotions and ultimately the feminine.

As I said earlier, there a 'chicken and egg' relationship between the latest technology and our model of ourselves. So not only do we make computers and then explain ourselves in the new terms, but also we see ourselves in a certain way and make technology in that image. So what does this tell us about the way we see ourselves?

I referred earlier to the concept of virtual space. Timothy Leary's bodily-fluids joke is funny, but it also highlights the fact that virtual space can be seen as representing a retreat from direct experience of the senses, each other and our environment. Is this a solution to the problems of modern life?

Perhaps the violent reaction to computers that one sometimes receives from people outside the field is a response to this remoteness, to this abstraction, to the idea of reducing the self to an algorithm, to a piece of information in a giant data base?

So the question is, what can we as artists, scientists and technologists do to return these missing babies to the bath water? What should we do? What responsibility do we have as people with a priviledged (though it can seem marginal) access to the defining technology of our age?

In closing I would like to quote two authors who, while writing about apparently different areas, converge at the crucial need for a holistic point of view:

"Our body is ourself. It is our only perceptible reality. It is not opposed to our intelligence, to our feelings, to our soul. It includes them and shelters them. By becoming aware of our body we give ourselves access to our entire being- for body and spirit, mental and physical and even strength and weakness represent not our duality but our unity."[25]

and

"The machine is not an 'it' to be animated, worshipped or dominated. The machine is us, our processes, an aspect of our embodiment. We can be responsible for machines 'they' do not dominate or threaten us."[28]

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"I'm starting to feel a bit spacey sitting here at my computer working on this paper. It's so easy to capture my thoughts and to work with them: editing, moving them around, making images, picking up writing from other documents etc etc. I'm very involved in this process. My body, when I remember to notice it, begins to feel stiff, even so I must FORCE myself to stop work for a while. But first I type this text, then add something else, then change something else......."

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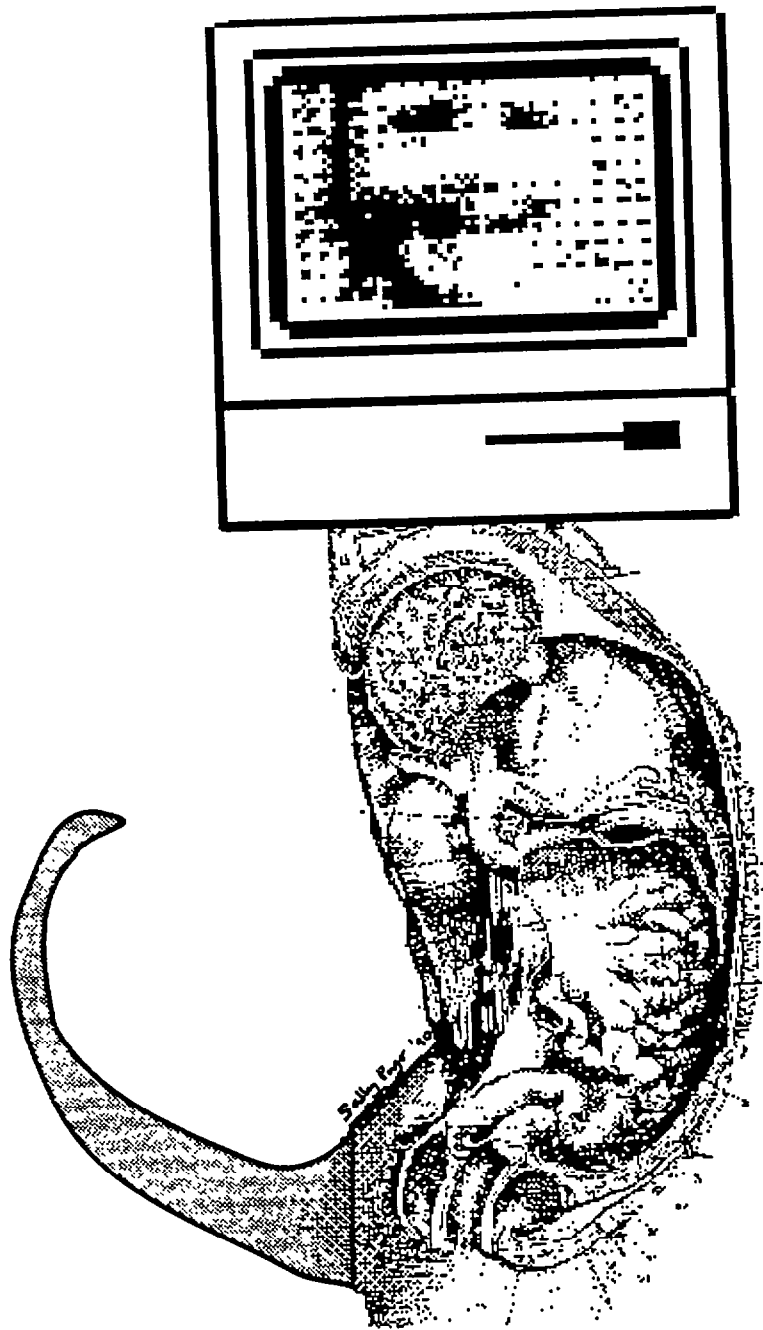
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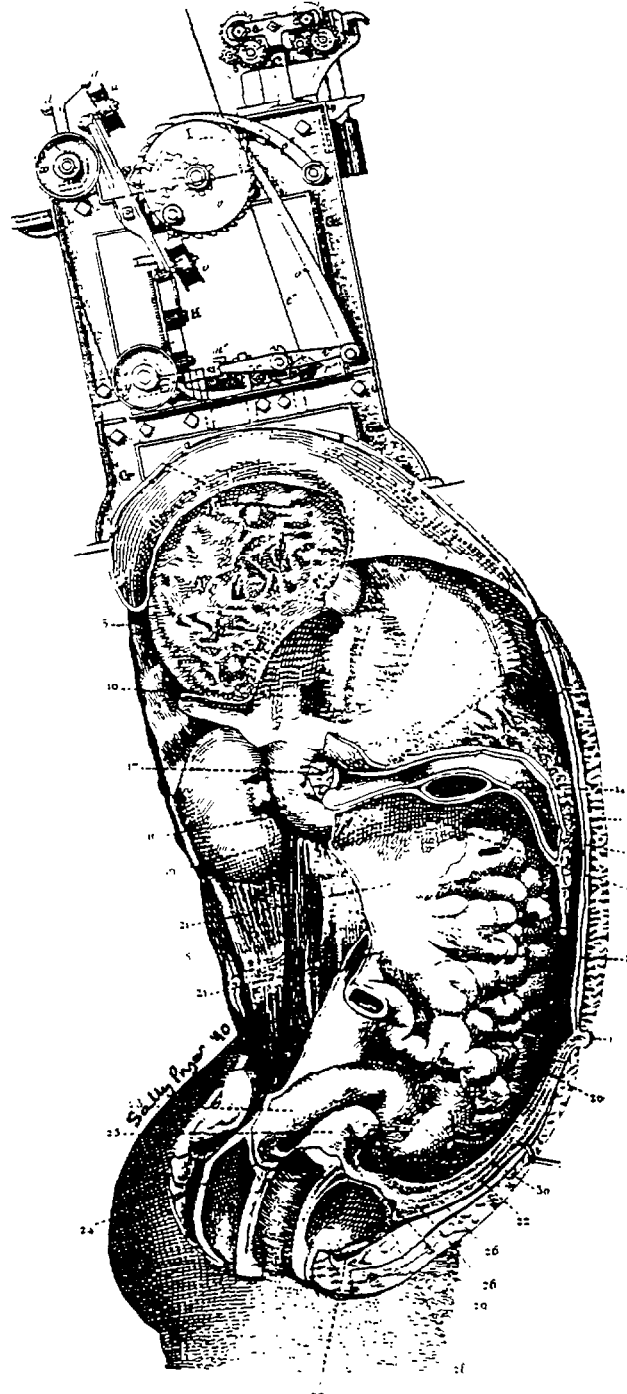
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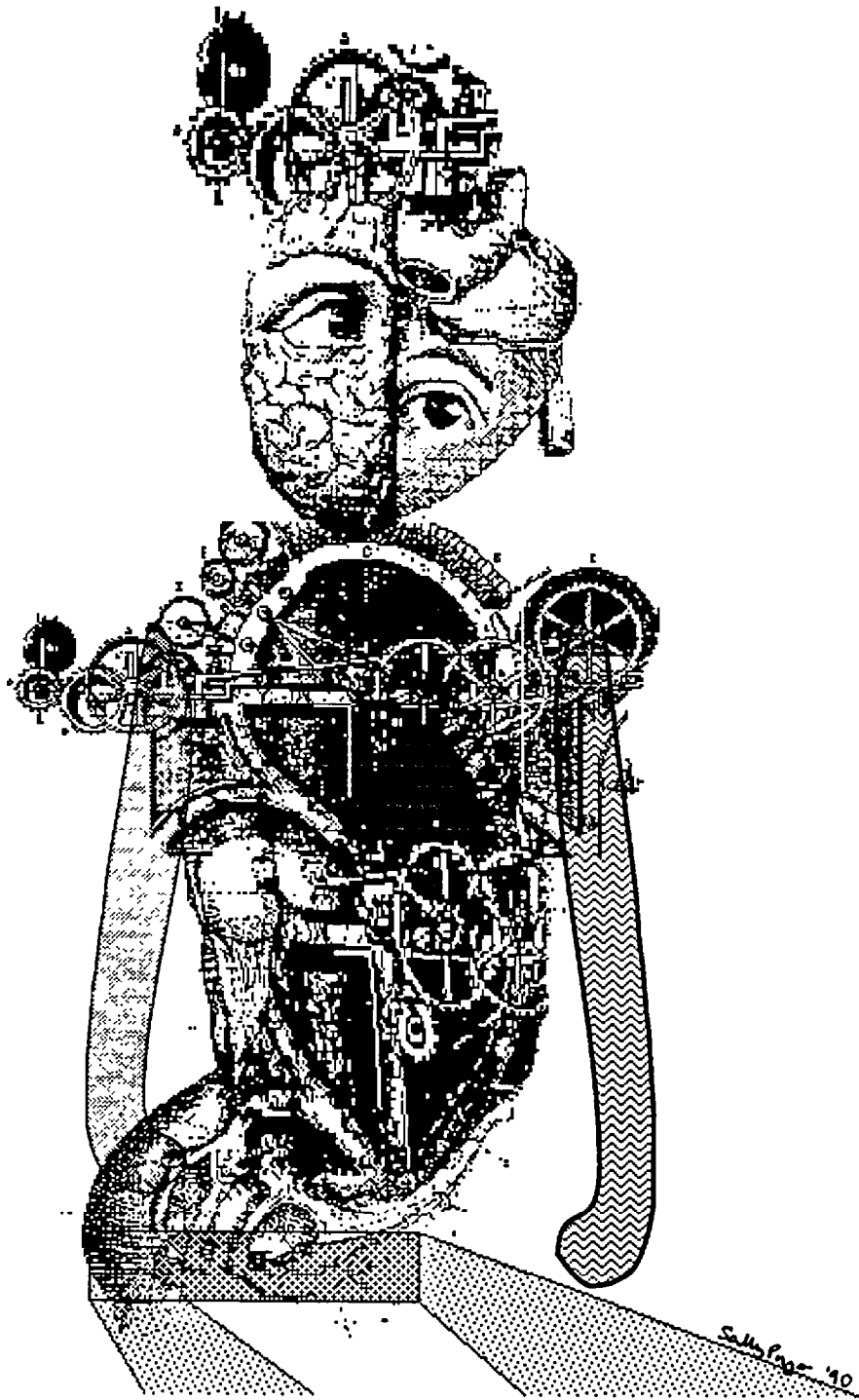
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