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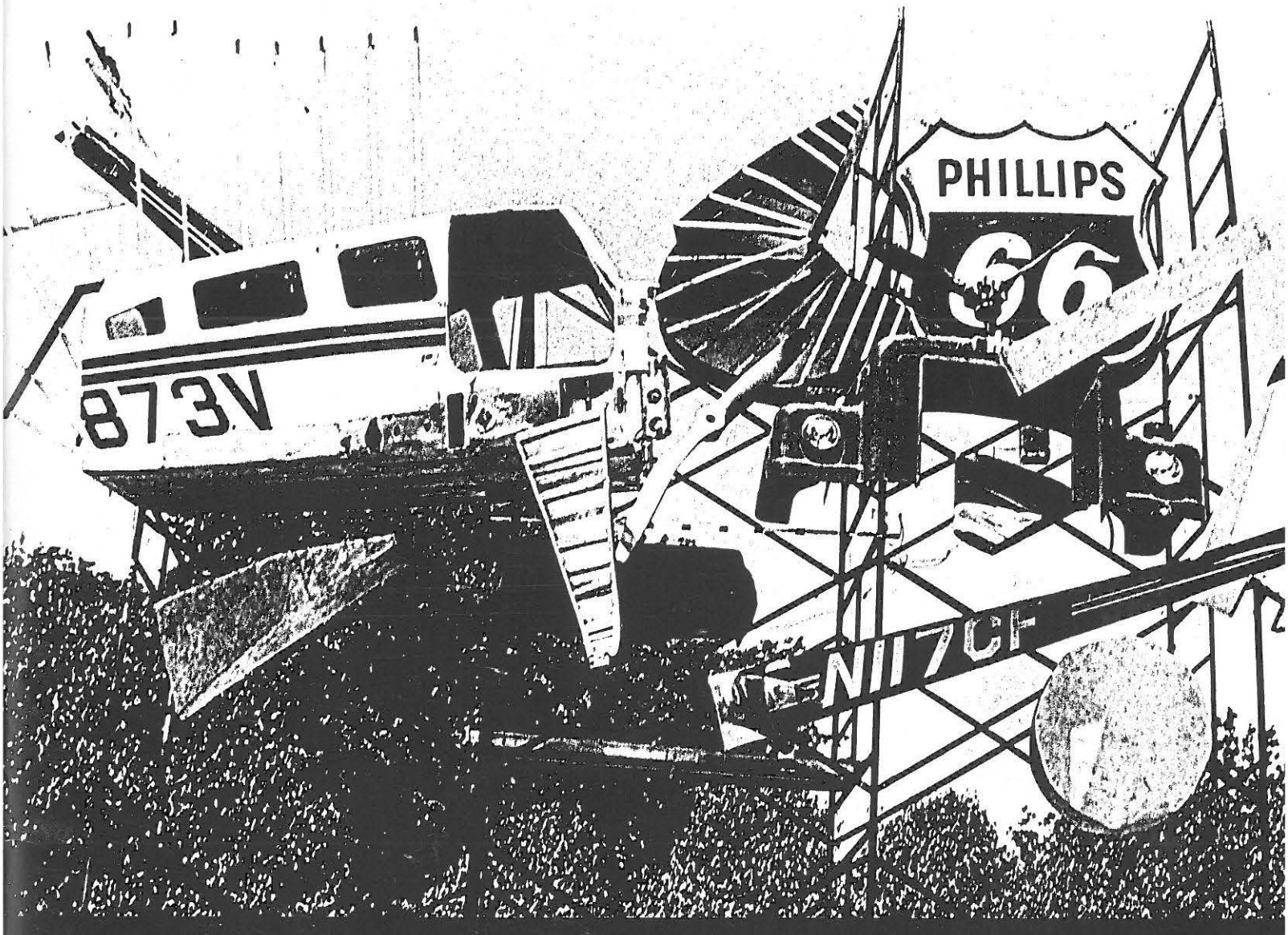
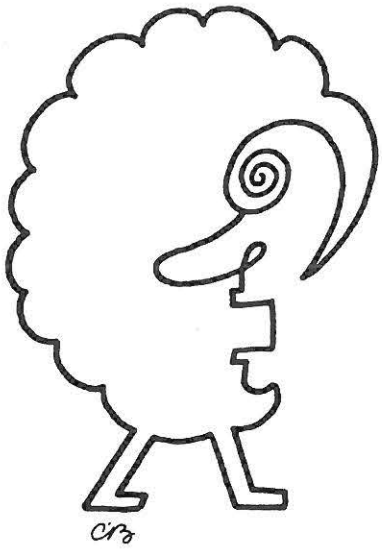
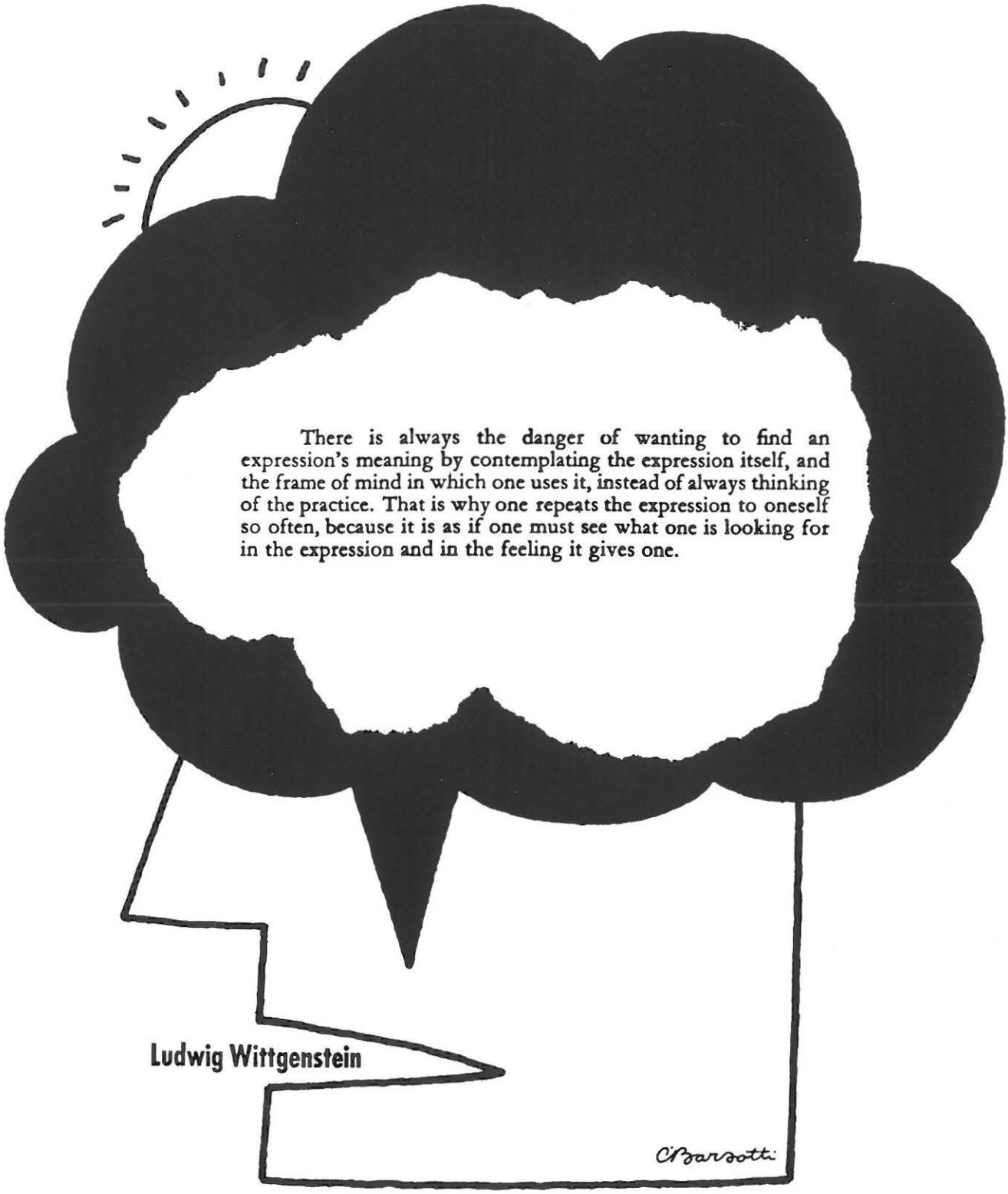


SOCIAL VIOLENCE




There is always the danger of wanting to find an expression's meaning by contemplating the expression itself, and the frame of mind in which one uses it, instead of always thinking of the practice. That is why one repeats the expression to oneself so often, because it is as if one must see what one is looking for in the expression and in the feeling it gives one.
Ludwig Wittgenstein
C. Barsotti

Cyber YOUR MIND

CONTENTS

Cover Front: outdoor sculpture by Jeffrey A. Rumaner, Kansas City, photographed by Sean Murphy. Back: three preliminary studies for the sculpture.

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n e t i c : the magazine WILL NEVER BE THE SAME...

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Introduction

When cyberneticians get together, I sometimes feel like a little girl who has fallen through a hole in the language into an Alice in Wonderland world of semantic traps, conceptual card houses and mental mirrors that reflect on their reflecting. I invite you to fall through that hole with me, into this issue.

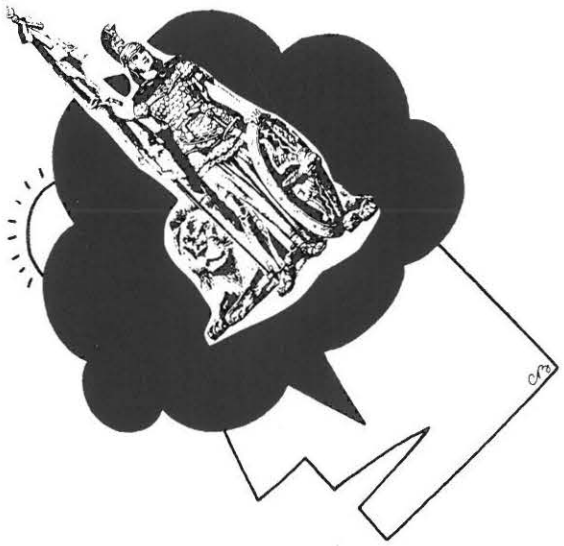
The authors you will meet are very curious creatures, called observers. They speak only to each other. In this world, "Everything said is said by an observer to another observer, who may be himself or herself," as Humberto Maturana observes on p.18. The Maturana you meet there does not look much like a himself or herself, he appears only in figures of speech from my notebook. You will bump into him in several other places as well, speaking about the nature of love and tyranny, in language that gets curiouser and curiouser as you think about it.

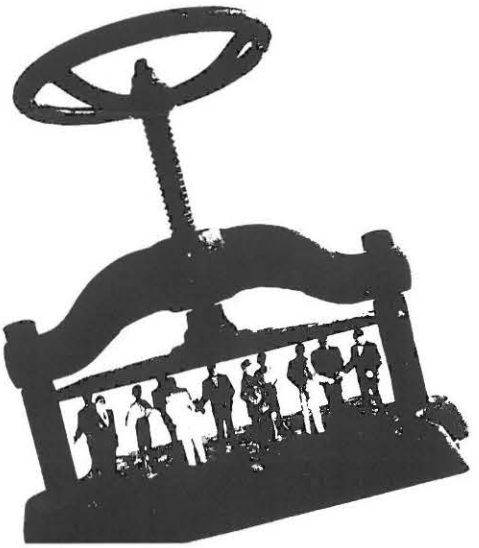
That is one of the beauties of this world. A lot of what these observers are saying to each other is said in strange circular languages that need a lot more attention than the words we usually encounter in the "real" world. But once you've fallen through that hole in the language with me, you may soon discover that cybernetic circularities, instead of leading you around in circles, may point to new ways out of the dilemmas that are destroying us in the "real" world.

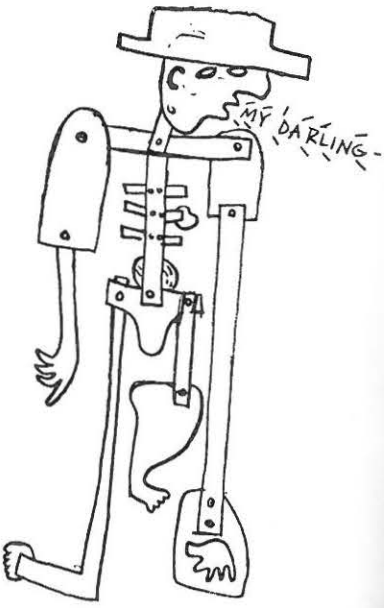
You may find Maturana, for example, hard to follow when he says of love (p.58): "Living systems may interact recurrently. If they do so their ontogenic structural drifts, that is the paths followed by their continuous structural changes, follow courses contingent to their recurrent interactions, and their ontogenies become coontogenies or coontogenic structural drifts." Now, you may not fall in love with this language at first sight, and in the "real" world you might head in the opposite direction if you met it. But here you are in a world of language games, and you are invited to adopt the same attitude that Samuel Taylor Coleridge once urged upon readers of poetry: the willing suspension of disbelief. The rewards of understanding Maturana are as great as with any metaphor weaver. And if his words make your head spin, it is only the beginning of the weaving process.

That same article on love, for instance, leads us to some clear understandings about the use of reason in the "real" world."It is through reason," he observes, "that we justify tyranny, the destruction of nature, or human abuse, in defense of our possessions, material or ideological ...The acceptance of the other without demands is the enemy of tyranny and abuse because it opens a space for cooperation. Love is the enemy of appropriation."

Edward Sampson also discusses the relation between reason and social violence, raising issues that recur in many articles in this issue: "I am not simply referring here to the nuclear arms race, but to all forms of destructive domination and exploitation....the relationships between men and women, between whites and nonwhites as well as between those who presently possess economic dominance and those who remain part of the world's underclass." (p.26)







Fransisco Varela brings forth new understandings in biology as a basis for new metaphors: "For me, the chance of surviving with dignity on this planet hinges on the acquisition of a new mind," he says, pointing toward a world "with no warfare between self and other." (p. 6)

Bradford Keeney undermines even the form of reason by abandoning it for a dialog on cybernetics of the absurd with Heinz von Foerster, who observes that "semantics and politics are two sides of the systemic coin named communication." Keeney, a therapist, sees the therapist's role as political. Maturana ties these thoughts together elsewhere, when he points out that we can kill each other with words.

Patricia Clough closes a variety of cybernetic circles in this issue; like the snake swallowing its tail, she deconstructs the constructivism of Ernst von Glasersfeld (p.64) and other cyberneticians with a "brutal reading of man and man alone" (i.e. "man and man alone is responsible for his thinking, his knowledge and therefore what he does"). Clough's prose is a labyrinth of postmodern critical thought, but finding a way through it offers some new paths for cyberneticians to move into the "real" world struggles of women and post-colonial societies. The first step is to observe the language of dominance in which some cybernetic observers still speak to himselves.

Where you find such language in the cybernetic wonderland of these pages, please trip over it.

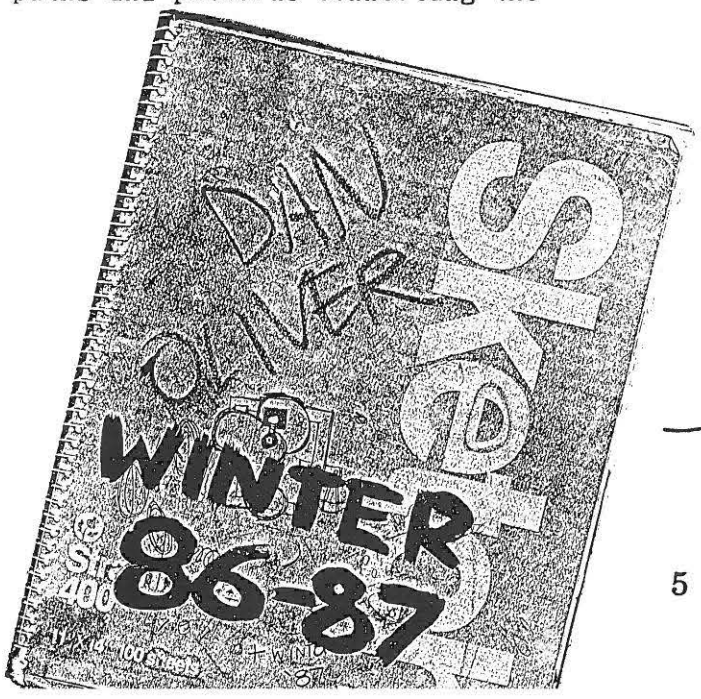
There are many ways to walk through this issue, many different paths and patterns connecting the articles. The meanings of the issue arise from art and poetry as well as science and philosophy. In making the first plans for a cybernetic magazine some years ago, designers Bruce McIntosh, Scott Kim and I dreamed up a place where art was not to illustrate a text, but was an equal participant in the meaning. Art has that sense in this issue. In putting it together, McIntosh turned to some of his students and others at the Kansas City Art Institute, as well as his neighbor, cartoonist Charley Barsotti. Dan Oliver contributed many pages from his notebooks, as well as some larger works. Sculptor Stretch Rumaner gave permission to use his monumental outdoor work on the cover, and drove the forklift that elevated photographer Sean Murphy into place for shooting the cover.

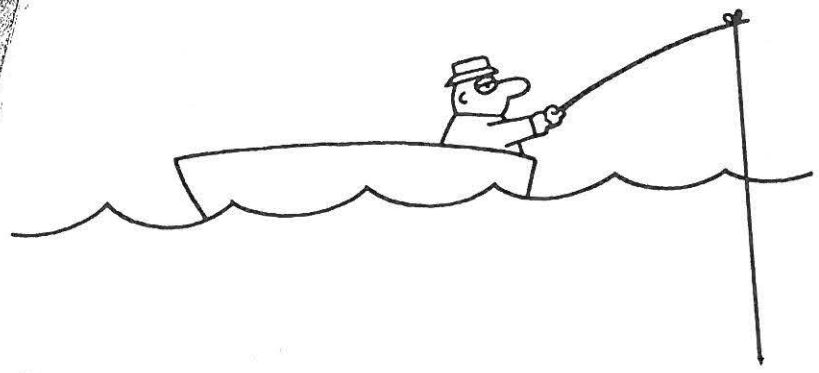
As Barsotti drew new cartoons for the issue, his wife Ramoth dug through old boxes in the basement to retrieve a set he had drawn during the Vietnam war, which he thought would have renewed meaning in this cybernetic context.

This is the first national publication of the students' work. Also published here for the first time are poems by a young poet, Brian K. Rushford, who is making a path where words are acts of peace-- a surreal path along which, as Heinz von Foerster once observed, "incoherence may not be an absence of coherence but fragments of coherence, scattered about, that have not yet been glued together."

This path could lead back to a world I would like to call real.

Paul Trachtman





LAYING DOWN A PATH IN WALKING: A biologist's look at a new biology and its ethics

Francisco J. Varela
CREA, Ecole Polytechnique and
Institute of Neuroscience (CNRS)
University of Paris

> The great sea
> Has sent me adrift,
> It moves me as the weed in a great river,
> Earth and the great weather move me.
> Have carried me away,
> And move my inward parts with joy.[1]

I am a bigot in epistemology. To me, the chance of surviving with dignity on this planet hinges on the acquisition of a new mind.

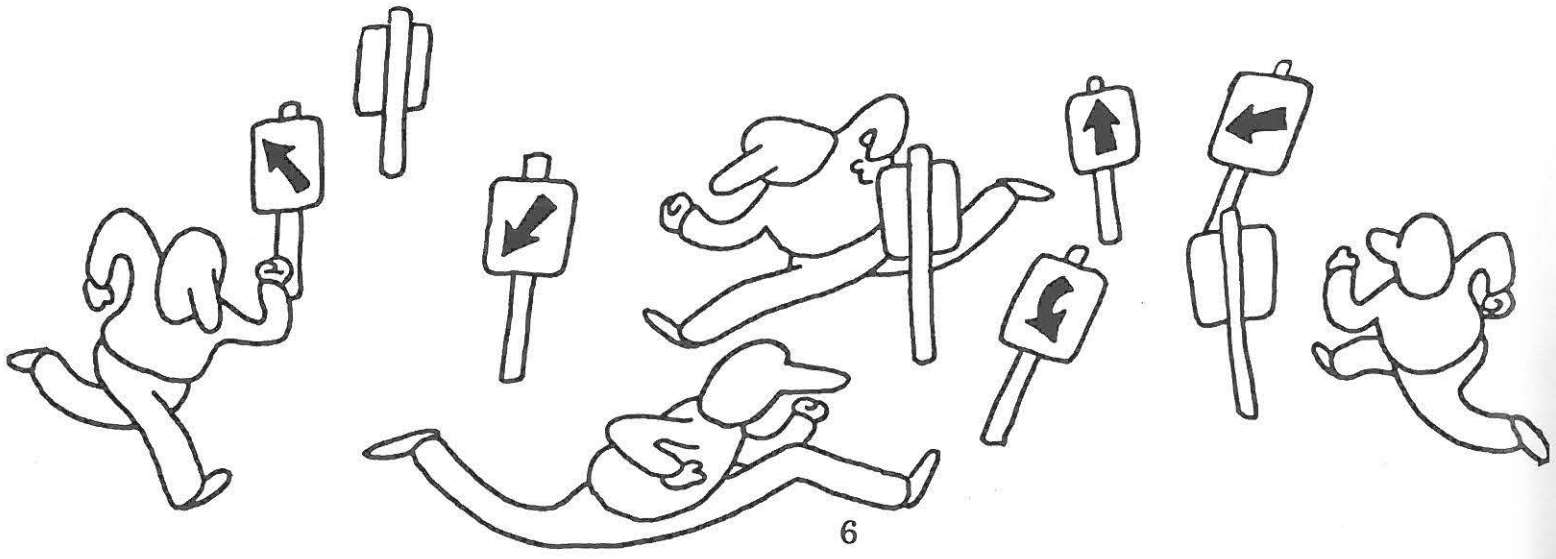
Like a fugue we hear from afar, the transition from where we are to where we shall be is ruled by a few chords that play over and over again, everywhere.

What moves me in the poem I have chosen as an epigraph is the swift somersault between the so-called inner and outer, between mind and nature, between rocks and bowels. Where do we find here the proud distance between us and it? There is no distance, not even the distance between an it and its picture, which makes it possible to ask how accurate a representation the picture is. The theme of the fugue I am hearing, then, moves past a split Cartesianism to give flesh to a world of no-distance by mutual interdefinition.

In these pages I intend to spell out this theme as it plays in biology, and the way in which it shapes some fundamental problems. This is what I understand to be the "new biology." It is a ferment of the current dynamics of biological research. I shall speak here as a research biologist, and not as a cultural historian.

Let me make a confession before I plunge into the subject. I am a bigot in epistemology. To me, the chance of surviving with dignity on this planet hinges on the acquisition of a new mind. This new mind must be wrought, among other things, from a radically different epistemology which will inform relevant actions. Thus, over and above their intrinsic beauty, I take these epistemological meanderings as vital. Literally. Therefore, in the discussion that follows, I would like you to direct your mind to the same place you would if the discussion were about, say, animistic cosmology. Our current notions about evolution and brain will be as distant to our grandchildren as this animistic cosmology is to us today.

My strategy for leading you in the direction I am looking will be as follows. First, I shall present a rough sketch of the main issues involved through the use of a metaphor disguised as a thought experiment. Second, I shall show how these issues take flesh in the current notions of evolution and its alterations, and, third, I shall examine the brain sciences from a similar perspective. The choice of both of these areas of biology is, of course, no accident, for evolution and cognition are really flip sides of the same conceptual coin (as Gregory Bateson was fond of reminding us). In the fourth and last section of the paper,



you will have, I trust, new conceptual goggles, so that when we come back to the main issues again, they will be virtually redundant to you. You will be able to state them in your own language, for your own concerns.

A first Glimpse into Autonomous Unity

A simple, yet quite accurate way to state what I see as the pivot of the transition from the old (half a century) into a new understanding is as follows. Instead of being mainly concerned with heteronomous units which relate to their world by the logic of correspondence, the new biology is concerned with the autonomous units which operate by the logic of coherence. Thus the contrast I am proposing is:

Current biology: Heteronomous units operating by a logic of correspondence.

New biology: Autonomous units operating by a logic of coherence.

Now, I might as well have written that in Martian, for those two aphoristic remarks are too densely packed. Let us move on to unfold the remarks by the aid of a thought experiment.

Imagine in your mind's eye and ear a mobile, with thin pieces of glass dangling like leaves off branches, which dangle from other branches, and so on. Any gust of wind will cause the mobile to tinkle, the whole structure changing its position, speed, torsion of the branches, etc.

Clearly, how the mobile sounds is not determined or instructed by the wind or the gentle push we may give it. The way it sounds has more to do with (is easier to understand in terms of) the kinds of structural configurations it has when it receives a perturbation or imbalance. Every mobile will have a typical melody and tone proper to its constitution. In other words, it is obvious in this example that in order to understand the sound patterns we hear, we turn to the nature of the chimes, and not to the wind that hits them.

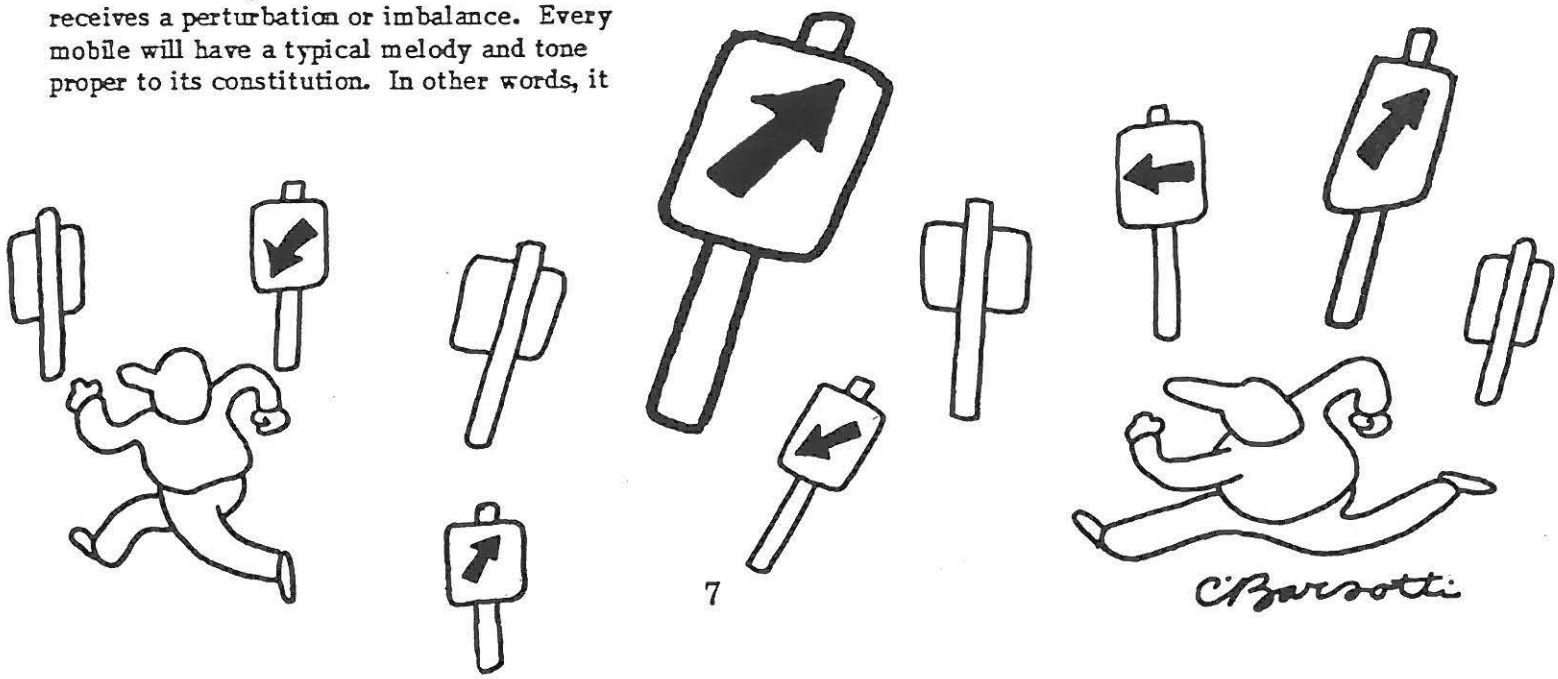
But let's carry this Gedanken experiment just one step further, and imagine now that the intricate structure of leaves and branches full of tinklers has the unusual capacity of moving the entire thing over the ceiling where it hangs. This could be accomplished, say, through detachable air-sucking devices which are alternately pressurized and depressurized. Thus, in this improved mobile-mobile, any gust of wind will produce not only a tinkling sound, but also a motion in some direction.

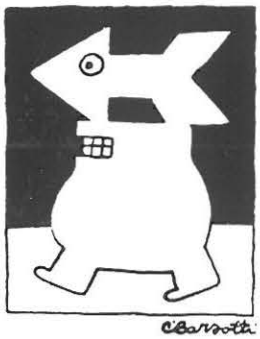
Wouldn't it be a surprise if we find that the whole mobile-mobile is moving with some sensible (to us) behavior? For instance, each time a wind blows, the mobile moves around until it finds a place with less wind, or conversely, it searches for the origin of the air current and thus delights us with almost perpetual melodies.

Evolution and cognition are really flip sides of the same conceptual coin.

If this mobile-mobile wind chime were to show such behavior, we would conclude that someone has designed it with cunning imagination so that it can do what it does. It seems utterly inconceivable that a mobile could come up with such smart motions by random arrangement of leaves, branches, and air-sucking devices.

The point of this example is to suggest the relative ease with which a degree of self-involvedness immediately gives the system a desire for autonomy vis-a-vis its medium.





That is to say, the fact that it handles its medium according to its internal structure becomes the predominant phenomenon. If you think of the mobile-mobile as having a perception of the world, then clearly perception is not a matter of what gets into it, like, for example, an instruction for a man-made device. Perception has to do, rather, with how the system is put together, and, moreover, with how it perceives itself, in the sense that its own entanglement is the key to understanding what will happen to it.

A second point of the example is to realize that, should an apparently sensible behavior arise, the temptation is to say that it has been engineered in some way. Let us examine this point more closely by introducing the last complication into our thought experiment, as follows. I now assure you that in the case of this mobile-mobile which exhibits such an interesting behavior there has been no design whatsoever; indeed, the structural configuration exhibiting such interesting behavior patterns was arrived at by pure trial and error, a sort of tinkering with the shapes of the branches and the interconnections with the air-sucking devices. What are we then to say?

There are two modes of description: One supposes mirroring and representations, the other supposes informing... The first description hinges on a logic of correspondence; the other on a logic by coherence.

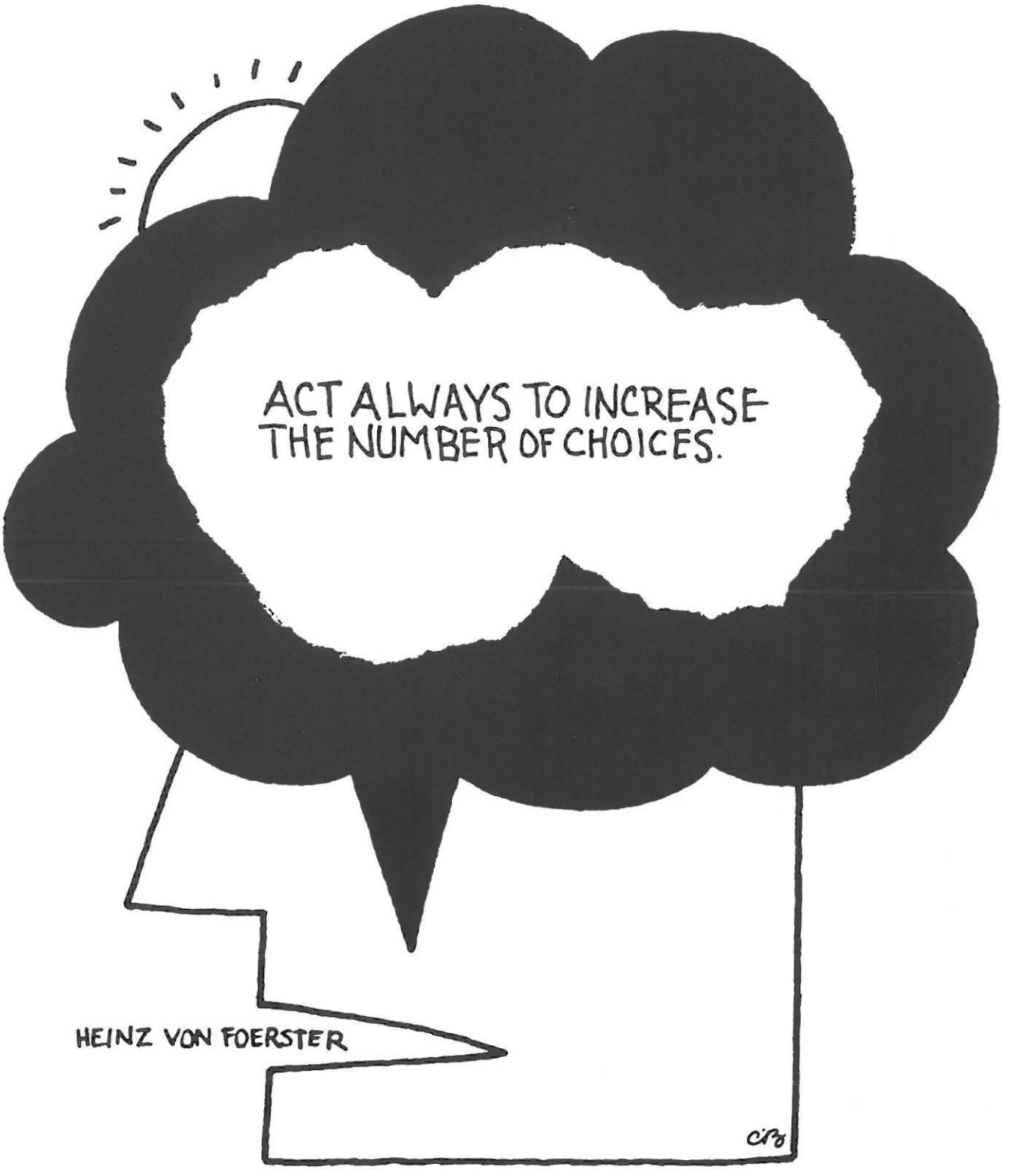
The traditional explanation (or description) of the situation would be that the system has some degree of internal representation of the physical environment, so that it knows how to respond to the wind. It has a correspondence to the world through a simple mirroring of some of its qualities. The mobile-mobile has become a representational system, that is to say: an active, self-updating collection of structures capable of "mirroring" the world as it changes. Now, if there had been an engineer who had actually figured out how to put the branches together so as to produce this behavior, such a description would seem appropriate. But, ex hypothesi, the system came into being by mere tinkering, not design. How then are we to approach this situation?

We need a subtle but powerful twist: we emphasize the system's coherence, instead of taking the perspective of a supposed design. In other words, we understand the system as an autonomous cognitive system: an active, self-updating collection of structures capable of informing (or shaping) its surrounding medium into a world through a history of structural coupling with it.

These, then, are two alternative modes of description. One supposes mirroring and representation of features which are relevant and visible to us as observers, and requires, in some form or another, an agent which designs, because it requires a perspective from which this correspondence of world to the innards of the system is established ex-professo. The second perspective is more parsimonious. It states that out of the many possible paths of tinkering, the particular one we observe allows us to see what is a world for the system, that is, the particular way in which it has maintained a continuous history of coupling with its medium without disintegration. There is no mirroring, but informing. The first description hinges on a logic of correspondence; the other on a logic by coherence.

There is more than meets the eye in this Gedanken experiment. It really underscores a change in attitude and framework that has ramified implications, as we shall presently see. The reasons for this are simple: we have changed our point of view from an externally instructed unit with an independent environment linked to a privileged observer, to an autonomous unit with an environment whose features are inseparable from the history of coupling with that unit, and thus with no privileged perspective. In so doing, we are also on our way to spelling out a mechanism by which cognitive processes can be understood and built, a mechanism by which unities can endow a world with a sense through their structure and history of interactions.

A description by correspondence is essential for relating to units such as computers and washing machines (until they break down), but it turns out to be a rather limiting framework to use when it comes to life and mind (that is, for almost everything). Let us now turn to what this framework does for our understanding of evolution and the brain.


ACT ALWAYS TO INCREASE
THE NUMBER OF CHOICES.
HEINZ VON FOERSTER

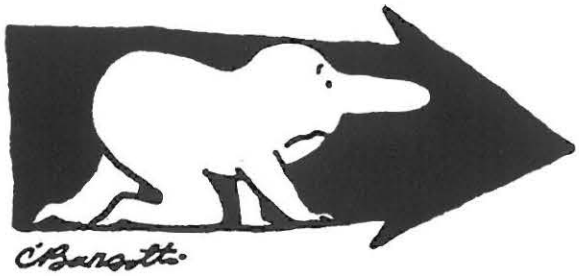
A Walk through the Adaptationist Program and Back Again

Think for a moment of the bar scene in Star Wars; picture the beings present there, and let us look at them through the eyes of a zoologist. The most obvious observation is that they are essentially of one kind: vertebrate-like. There are wild varieties in dermatological appearance—type of skin, shape of eyes—but they stand up straight, and most of them even look warm-blooded. How a culture conceives of imaginary beings is a clear indication of its conception of life, because it sets off the limits of what is imaginable. In seventeenth century zoology texts, next to eagles and chickens, we can find beings with human bodies bearing birds' heads. It was all conceivable, part of the same nature. In the twentieth century showcase of imaginary zoology in Star Wars, we see nothing of the sort; uniformity is the essential guiding principle.

Evolution is poorly described as a process whereby organisms get better and better at adapting. Rather they allow us to see that there are many paths of change, all of which are viable if there is an uninterrupted lineage of organisms. It is not a matter of the survival of the fittest; it is a matter of the survival of the fit.

The point of this digression is to introduce the idea that in our culture at large—including science—we see ourselves as the best and only possible way of being intelligent. We have come up from modest beginnings through a direct path of optimization in an evolution guided by natural selection. What are the biological roots of this commonsensical understanding? The answer to that question lies in the main characteristics of evolutionary thinking over the last half century, which is in fact not difficult to state: the search for optimal mechanisms of adaptation to the world. Let me explain.

Stated bluntly, this approach assumes that species and communities have become, through their history, optimally adapted to their niche. The job of the evolutionist is to find the precise ways in which this process has occurred. It is not a matter of if, but how. Natural selection is seen as an ingenious engineer or smart gambler in the game of life versus environment (without assuming an external purpose, of course).

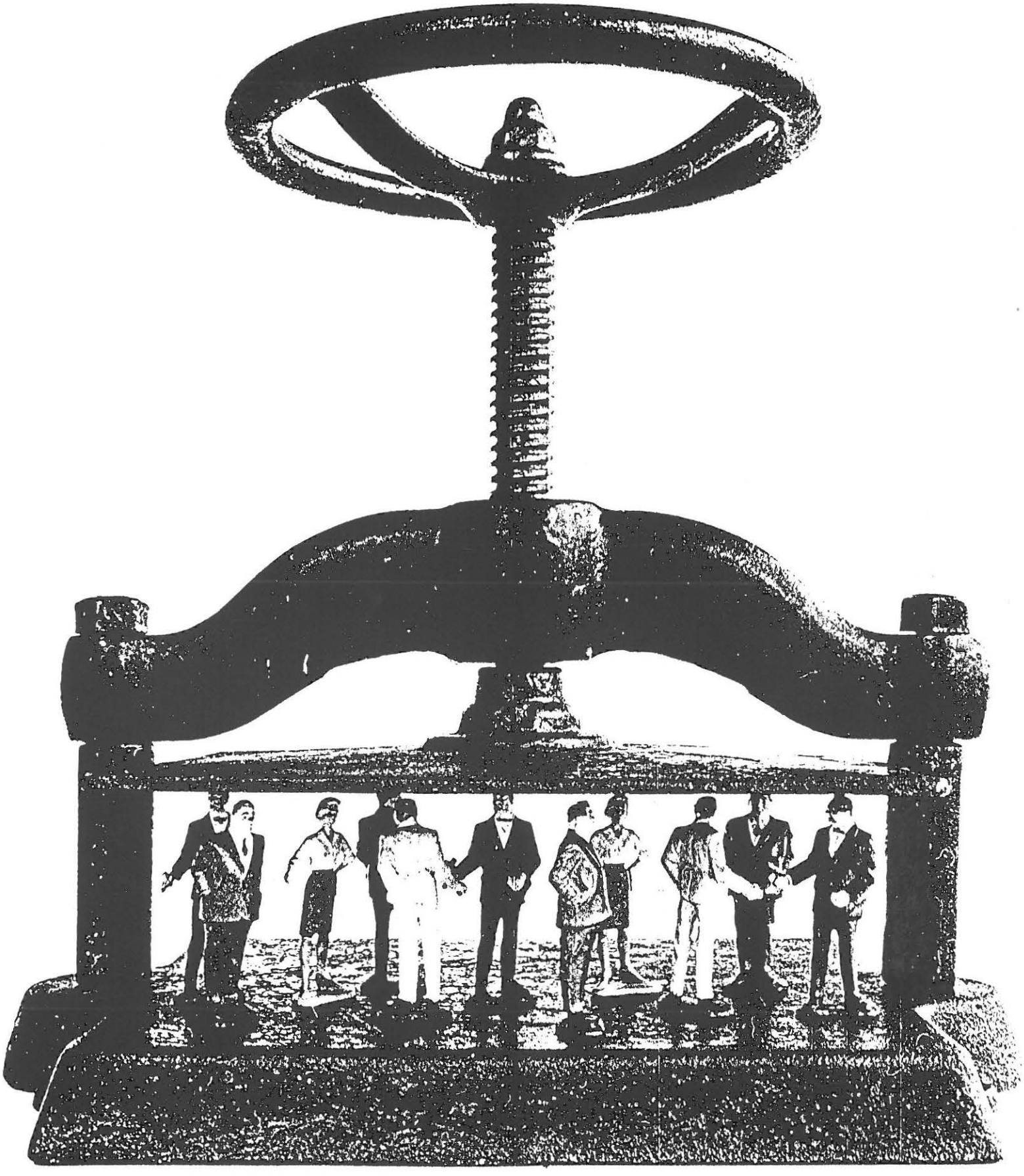


The search for this optimization most commonly takes the form of isolating a specific trait from the organism's morphology, physiology, or behavior, and finding what it is optimum for and how. For example, one shows that the shape of cilia in protozoans are such that they are at their hydrodynamic optimum. (This sometimes gives rise to puzzles, when there is no evident feature of the world to deal with: What are the big plaques on Stegosaurus for?)

There is another stream of research in evolutionary biology which starts from an entirely different point of view, but ends up at exactly the same place. This is the study of population genetics. The idea here is to produce a description of the genetic endowment of communities on the basis of reproductive patterns and geographical distribution. The goal is to predict the rate and direction of change of genetic pools. The underlying view is still the same: the equations governing the genetic dynamics must have an optimal solution which maximizes fitness.

There has been much discussion, both within science and in popular scientific publications, about how this "classical" view of evolution has recently come under much criticism. I believe, however, that most of these discussions miss how deeply revisions have undercut the evolutionary thinking of contemporary biology.

At the very core of the matter is the question of optimality. In fact, whether at the genotypic or the phenotypic level, the classical approach is to consider separate traits which supposedly undergo progressive betterment in their fitness. But every biologist also knows that genes (or cistrons) are as intricately interrelated as are body organs, and cannot be dealt with separately. Further, the genotype and phenotype are mutually interdependent: one specifies molecular species, the other specifies which of the molecular species gets expressed. (In this sense, to speak of a genetic "program" for a species is at best misleading.) To search for paths of optimization in separate traits, given this degree of mutual specification, is to say that one tries to clamp down this interrelatedness as much as



Assemblage by Bruce McIntosh

possible and hope for the best. The best is usually expressed as some sort of trade-off or compromise between traits. But even this is too feeble. The search for trait optimization has, in fact, failed to produce basic mechanisms capable of explaining major evolutionary phenomena, either at the genetic level or in morphological change. This failure has been documented in various critical discussions.[2]

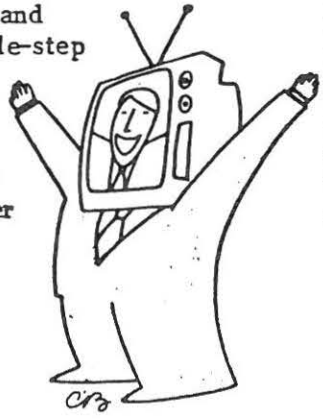
The reliance on optimal adaptation is not the only way to understand organic evolution, and its alternatives are quite natural. But we need to move out from the classical framework to see that natural selection was never intended as a trait-by-trait optimization. It states, rather, minimal conditions which will be satisfied under the conditions of differential reproduction among the members of a population. This amounts to setting broad boundaries within which many pathways may be taken, as in a proscriptive rule (what is not forbidden is allowed). But this is a far cry from a prescriptive rule (what is not allowed is forbidden). Here are two concrete illustrations of what this means.

What adaptationism is for evolutionary biology, representationism is for neuroscience.

There was nothing to prevent the brain from being a fleshy information picker. With the advent of computers, the engineering metaphor was solidly entrenched and became common sense.

First, natural selection does not necessarily lead to steady betterment in some trait. At the genetic level, this is also true: genetic interactions do not lead to multiple combinations with other genes, all of which are phenotypically equivalent for natural selection. For example, among salamanders it is possible to find remarkable morphological constancy, which nevertheless is mediated through very different genetic pools.[3]

Second, the manifestation of genetic change in a population is to a very significant degree a manifestation of the internal coherence of the organisms themselves, much more so than through a selection process. In fact, genetic changes will inevitably disrupt the well established paths of embryological development. But this is such a delicate and intricate process that single-step disruption is much less possible than radical alterations resulting in radically different phenotypes. This is, among other things, what underlies the apparent "punctuated equilibrium" which best describes the fossil record of, for example, marine invertebrates. Species mostly stay in evolutionary stasis, and when they change they do so, not in a gradualistic fashion, but by sudden jumps.[4]



These two dimensions of evolutionary change, neither of them minor, should suffice for now to illustrate that evolution is poorly described as a process whereby organisms get better and better at adapting. Rather they allow us to see that there are many paths of change, all of which are viable if there is an uninterrupted lineage of organisms. It is not a matter of the survival of the fittest; it is a matter of the survival of the fit. It is not the optimization of adaptation, but the conservation of adaptation that is central: a path of structural change of a lineage congruent with its environmental changes. This view of evolution, centered on the conservation of adaptation as a minimal condition, we call natural drift.[5]

In moving from an adaptationist view to an understanding of evolution as natural drift, we have also moved from a logic of correspondence to a logic of coherence. We have left behind the view of mirroring nature in adaptive terms, for a situation of tinkering with whatever is at hand.

A Walk through the Representationist Program and Back Again

By now, I hope, the ideas I am trying to convey are beginning to take shape in your mind, so that we may quicken the pace in this promenade through a similar conceptual landscape for the brain sciences. Briefly stated: what adaptationism is for evolutionary biology, representationism is for neuroscience.

Imagine for a moment a black and white television set, sitting in your living room, and try to see the color of the screen. It is gray. Now, imagine that you turn the device on, so that you see images. They will not only be gray, but also black and white. The textbooks say that we see black in the absence of light, white with an intense light, and gray for the cases in between. But when the television is off, it has no way to produce a brightness on the screen through its

electron beam, so we should see the screen at its blackest. In contrast, when the television set is on, however dimly, there should not be less illumination than when the device is off. Yet we all clearly agree that we see black when it is on.

In this simple example we have a capsule statement of the predominant way of thinking in neuroscience for the last fifty years. The idea is that the world has some specific features (such as light) which have a corresponding image inside, through some "mirroring" device (such as the eye), so as to produce a perception (brightness in this case). A feature of the world corresponds to a representation in the system, and this is the key for adaptive actions in the world.

The roots of this mode of thinking in neurobiology are far less clear than in the case of evolutionary biology. On the one hand, there seem to have been a tremendous influence of the newly formed engineering disciplines in the early forties. The increasingly sophisticated man-made devices were designed to handle specific forms of specifiable information, and they were successful at that. So there was nothing to prevent the brain from being a fleshy information picker. With the advent of computers, the engineering metaphor was solidly entrenched and became common sense. On the other hand, neurobiology itself began to describe sense organs as true filters detecting specific configurations in the organism's environment. In an extreme form, this became the single-cell doctrine of sensory perception, which though extreme, is not far from the sensibilities of most contemporary researchers. For this doctrine, not only perceptual items but also cognitive and motor abilities are encoded in particular kinds of neurons which stand for these performances.

The brain-as-computer metaphor, which we tend to take for granted, is, like adaptationism, nothing but one possible approach, and one plagued with problems at that. To illustrate my proposed alternative, let me return to the television set example.

It is evident in this case that black is not simply "represented" inside to correspond to a certain amount of light intensity. What then? One interesting answer is that the perception of black has to do with the relative activities in the overall retina. When we have images on the television screen, there are changes in the ratios of these relative activities, which is not the case with the uniform screen when the set is off. In other words, the perception of black cannot be studied in terms of the light falling on the retina (since we will see black at any level of illumination), but rather on the way this component of the nervous system is constructed so that some specific comparisons between light receptors are performed (out of the many conceivable ones). These comparisons establish levels of relative activity which are closely connected to the way brightness appears to us.[6]

The brain-as-computer metaphor, which we tend to take for granted, is, like adaptationism, nothing but one possible approach, and one plagued with problems at that.

Now, the retina is nothing but one tiny portion of this nervous system which throughout has the same characteristic of having multiple interconnections in a network, so that every state of neural activity only results in other states of neural activity, and every one of these states depends ultimately on the overall pattern of the entire brain. To make this a bit more concrete, we may contemplate the fate of the fibers reaching the brain from the retina:

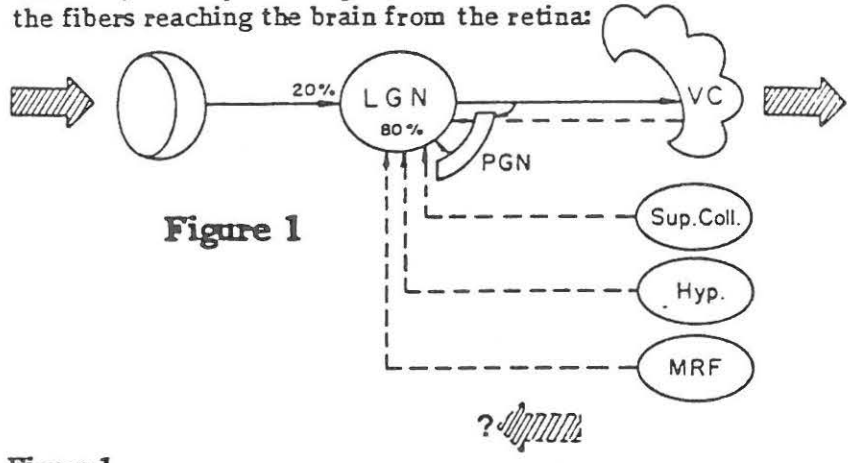


Figure 1

Figure 1
The retina projects to the brain at several places, including the thalamus at a nucleus called the lateral geniculate (LGN). The LGN is usually described as a "relay" station to the cortex. However, at closer examination most of what the neurons in the LGN receive comes not from the retina (less than 20%), but from other centers inside the brain including the visual cortex (VC), superior colliculus, hypothalamus, and the reticular formation (MRF).

What reaches the brain from the retina is only a gentle perturbation on an ongoing buzzing of internal activity, which can be modulated, in this case at the level of the thalamus, but not instructed. This is the key. To understand the neural processes from a nonrepresentationist point of view, it is enough just to notice that whatever perturbation reaches from the medium will be in-formed according to the internal coherences of the system. Such perturbation cannot act as "information" to be processed. In contrast, we say that the nervous system has operational closure, because it relies essentially on internal coherences capable of specifying a relevant world.

In this middle-way view, what we do is what we know, and ours is but one of many possible worlds. It is not a mirroring of the world, but the laying down of a world, with no warfare between self and other.

The differences between adaptationism and operational closure are not mere philosophical curiosities; they entail differences as research strategies. Over the last decades, the preference has been for detectors which embody particular adaptive features. The alternative is to search for cooperative mechanisms which can shape neural coherences. We cannot go further into details here.[7]

Autonomous Unity and Natural Drift

Let us stand back now from these two quick glances to evolutionary thought and brain science, and see them as matching pieces of a common pattern against which a new conceptual framework emerges. I can now formulate the common ground of a "new" biology in terms of the key notions presented above. This common ground can be stated in terms of two crucial changes of emphasis.

The first is putting the emphasis on the way autonomous units operate. Autonomy means here that the unit described (be it a cell, a nervous system, an organism, or a dangling mobile) is studied from the perspective of (that is, uses as a guiding thread) the way in which it stands out from a background through its internal inter-connectedness. Such cooperation of self-organizing mechanisms can be made quite explicit in some cases; the research has just begun.

The second change is putting the emphasis on the way autonomous units transform. Transformation means that natural drift becomes possible due to the plasticity of the unit's structure. In its drift, adaptation is an invariant. Many paths of change are potentially possible, and which one is selected is an expression of the particular kind of structural coherence the unit has, in a continuous tinkering. Natural drift applies to phylogenetic evolution as well as to learning, depending on the unit being considered (a brain in one case; a population in the other).

I have presented a few thoughts about these ideas in the realm of the brain and evolution; clearly they can also be put to work in other realms, such as immunobiology and artificial intelligence.

Autonomy and natural drift, although I have described them separately, are complementary. They are the two basic chords of the fugue I hear in the background. Let me depict them more graphically in relation to the pairs of opposites in which the classical view is rooted.

middle-way: meta-level

	dominant view	its logical opposite
Epistemology	eternalism objectivism	nihilism subjectivism
Evolution	adaptationism	creationism
Neuroscience	representationism	solipsism

My proposal is that in this change of conceptual goggles we need to take the middle way between these logical opposites. This is not a compromise, but rather a going beyond the conflict by jumping to a metalevel.

I firmly believe that this growing framework in biology is important, as I said in the beginning, not only because it is an interesting scientific debate. It is also important because biology is the source of most metaphors in current thinking, and within biology it expresses the possibility of a world view beyond the split between us and it, where knowledge and its world are as inseparable as the inseparability between perception and action. In this middle-way view, what we do is what we know, and ours is but one of many possible worlds. It is not a mirroring of the world, but the laying down of a world, with no warfare between self and other. Actually, this poem by Antonio Machado says it more clearly than I could:

Caminante, son tus huellas
el camino, nada mas;
caminante, no hay camino,
se hace camino al andar.
Al andar se hace camino
y al volver la vista atras
se ve la senda que nunca
se ha volver a pisar.
Caminante, no hay camino,
sino estelas en la mar.[8]

(Wanderer, the road is your
footsteps, nothing else;
wanderer, there is no path,
you lay down a path in walking.
In walking you lay down a path
and when turning around
you see the road you'll
never step on again.
Wanderer, path there is none,
only tracks on the ocean foam.)

This view of knowledge and action has an obvious ethics associated with it. This ethics is based on permanently giving up certainty. More precisely, it is based on giving up the tendency we living creatures have to bring forth a world (as we dicussed before), to forget we have done so, and then to fixate on it as certainty. This temptation of certainty is the solidification of self against other, of delimitation of national boundaries in opposition to other human societies, in brief, the source of suffering. It is also the pivot point that many traditional teachings have sought to overcome for centuries. It does not seem to have made a great difference on this planet, except in a few fortunate ones. My hope is that if modern science can rediscover in its own way this profound truth, then the ears of our contemporaries will be more open and receptive because of the authority that science carries in our western world. The learning of the inevitable letting go of certainty, letting go of solid fixation on self and national boundaries, is, in my eyes the most needed antidote for our times, and the quickest path to survival altogether. I am also aware that to know and understand this is not enough; then comes the slow and patient learning and internalizing that each one of us has to undergo. But understanding is at least a first step.

Footnotes

1. Poem by an eskimo women, reproduced in R.Bly (Ed.), News of the Universe: Poems of two-fold consciousness, Sierra Books, California, 1981.
2. A particularly precise discussion is: G. Oster and S.M. Rocklin, Optimization models in evolutionary theory, in: Lectures on Mathematics in the Life Science, Vol. 11, Rhode Island, American Mathematical Society, 1979.
3. D. Wake, G. Roth, and M. Wake, Organismal stasis and evolution, J.theor.Biol. 54:123-134, 1984.
4. S. Stanley, Macroevolution, Freeman, San Francisco, 1979.
5. See Chapter 3-5 of H. Maturana and F. Varela, The Tree of Knowledge: A new look at the biological roots of human understanding, New Science Library, Boston, 1986.
6. For details on this experiment see E. Land and J.J. McCann, Lightness and retinex theory, J.Opt.Soc.Amer. 61:1-11, 1971.
7. The notion of closure is introduced and extensively discussed in F. Varela, Principles of Biological Autonomy, North-Holland, New York, 1979. For an introductory account see H. Maturana and F. Varela (1986) op. cit.
8. A. Machado, Soledades, 1936.

Acknowledgements

It is a pleasure to acknowledge here my gratitude to the Lindisfarne Association and its Fellows, and to its director William I. Thompson in particular, for providing over many years a creative milieu where these ideas and concerns have been shaped. Financial support from the W. Woods-Prince Trust Fund is gratefully acknowledged.

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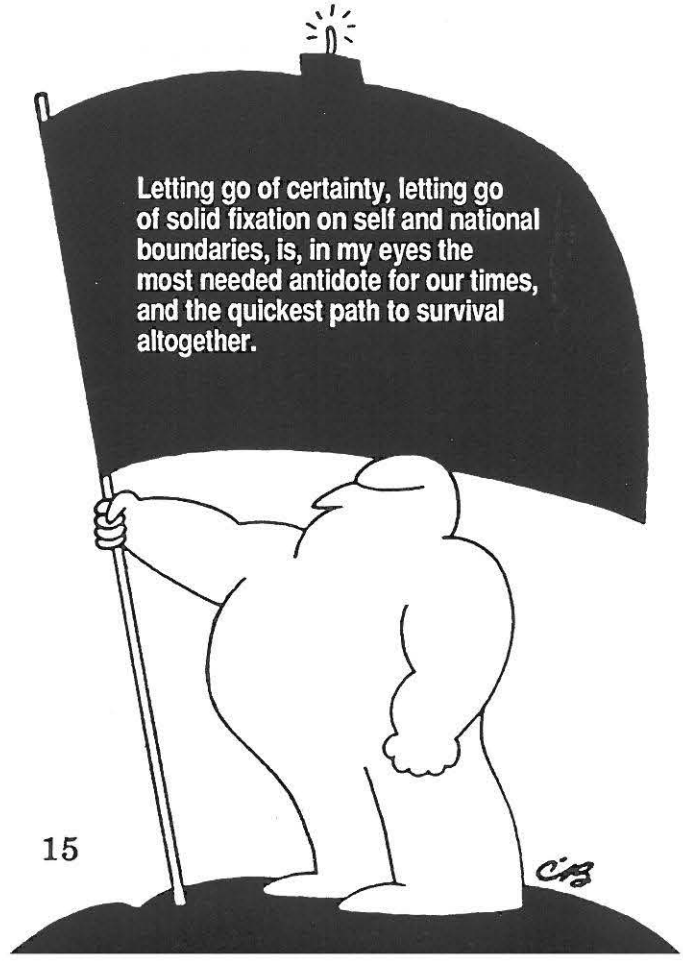


IF A TOASTER WERE DESIGNED BY A COMPUTER COMPANY

by Jef Raskin

Imagine getting up in the morning, wandering bleary-eyed into the kitchen for breakfast, and deciding that a piece of toast would be just the thing. Since toasters are designed by appliance companies, all you do is pop the bread into the toaster and push a lever, and in a short while, you've got toast.

//R@

and in 40 seconds the little screen says

A>

which by now you know means that you type

LOAD TOASTIT.CODE

and in 25 seconds you get a menu on the screen. How appropriate for breakfast! The menu says:

WHAT KIND OF BREAD WILL YOU BE USING?

a White
b Wheat
c Rye
d Pumpernickel
e Bagel
f Croissant
g English Muffin

Underneath the layer of breadcrumbs in the breadbox you search for and find your sole remaining English Muffin, so you type

g

and wait. Nothing happens. You forgot to press the ENTER key. Eventually you figure out what is wrong, so you press the ENTER key.

The toaster isn't about to do anything rash, so it asks:

ARE YOU SURE? (Y/N)

The one thing you are sure of is that you want to throw the toaster through the window, but since you paid $2,745.99 for it, you don't. Nonetheless, this is the way things are done in this modern age, and you don't want to be left behind. From your 10-week course "Today's Toasters" which you got for free when you bought your toaster you happen to remember that the cryptic "(Y/N)" means "Yes or no?" and you are supposed to type

Y

which stands for "yes" and quickly press the ENTER key. You learn fast.

Sorry, charlie. For this question you don't have to hit ENTER. In fact, if you do, the system sees that you've made a mistake and starts over with the first menu. So you swallow your anger instead of your toast, and carefully type

g

then press

ENTER

and finally tap

y

and are rewarded by —

another menu:

HOW DO YOU WANT IT TOASTED?

1. COLD
2. TAN
3. TAWNY
5. LIGHT BROWN
6. BROWN
7. SERIOUSLY BROWN
8. BURNT OFFERING

You want it brown, so you type

6

and go into a spasm of indecision. To press or not to press ENTER? A wrong decision here could spoil what is left of your morning. A quick peek at the manual might save your having to go through this whole mess again; unfortunately, this early in the morning you aren't up to lifting the manual, so you take fortune in hand and press

ENTER

upon which you get

ARE YOU SURE (Y/N)

"What the blazes!" you yell, not caring if the neighbors hear, "if I wasn't sure I wouldn't have typed it in the the first place!"

Yelling has no effect on the machine. So you master your anger, and with a desperate outward calm masking the terrible rage beneath, type

Y

and instantly become a quivering mass of indecision — do I press ENTER? Fortunately you didn't because the screen now says

LOAD BREAD IN SLOT 1. PRESS RETURN WHEN READY.

"About time," you mutter under your breath, so that it doesn't hear you. You look at the two slots on the toaster. Which is slot 1? They are marked "P" and "Q". Point for the computer! you are forced to look up which is slot 1 in the manual. You find out, and put in your muffin. You are late for work, but you are beyond caring.

Nothing is happening.

You press RETURN.

The screen says

DO YOU WANT TO SAVE THIS BREAKFAST? (y/n)

You'd do anything to save this breakfast. But you remember from your course that you can save this whole sequence of nonsense on a floppy diskette, and not have to go through this ritual every morning.

So you type

Y

and press

ENTER

and get a message on the screen:

NO DISK IN DRIVE 2

So you go back to the bedroom, take a $3.00 floppy disk out of its box, and put it in slot 2, where it promptly gets toasted.

After clearing out the acrid smell of burnt plastic, you get another floppy disk and put it in DRIVE, not SLOT 2. You press ENTER. Nothing happens. You press RETURN. Nothing happens. You hit the space bar. This is it! the disk whirrs and you get a message.

DISKETTE IN DRIVE 2 NOT FORMATTED

Now if this were a toaster, you would forget what you paid for it, you would forget that the window is closed, you would forget that you come from a lineage that has been civilized for a thousand years, you'd throw that toaster through the window, stomp on it, send the pieces back to the manufacturer and ask for, or rather demand, a refund — on your lawyer's letterhead.

But hold on there, Charlie. If you don't learn to use this toast system, Ned in the next office just might, and when it comes to promotion time, you know what will happen.

The manual doesn't have an index, so you can't find out how to format a diskette (and have no idea what this means anyway) so you call up your dealer. He says that you simply have to go back to command level, load the utilities diskette, and run a program called FORMAT.UTIL.

But, you ask, doesn't this mean that you are going to lose your breakfast choices to this point? Yes, says the dealer, but if you had a hard disk, you could have just saved everything without all this bother and it would have run twice as fast.

A hard disk only costs $1,295.99, and the hard disk operating system only $295.99.

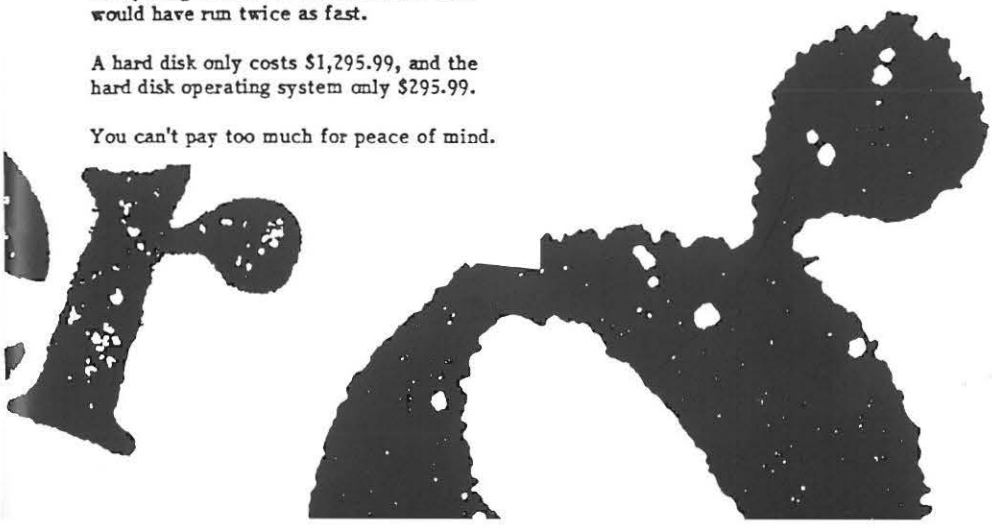
You can't pay too much for peace of mind.

SONNET

Upon this age, that never speaks its mind,
This furtive age, this age endowed with power
To wake the moon with footsteps, fit an oar
Into the rowlocks of the wind, and find
What swims before his prow, what swirls behind—
Upon this gifted age, in its dark hour,
Rains from the sky a meteoric shower
Of facts . . . they lie unquestioned, uncombined.
Wisdom enough to leech us of our ill
Is daily spun; but there exists no loom
To weave it into fabric; undefiled
Proceeds pure Science, and has her say; but still
Upon this world from the collective womb
Is spewed all day the red triumphant child.

— Edna St. Vincent Millay

"Sonnet" by Edna St. Vincent Millay is from HUNTSMAN, WHAT QUARRY?; reprinted by permission.



EVERYTHING SAID IS SAID BY AN OBSERVER TO ANOTHER OBERVER, WHO MAY BE HIMSELF OR HERSELF.

HUMBERTO MATURANA

OBJECTIVITY WITHOUT PARENTHES DEMANDS A UNIVERSE
(OBJECTIVITY) DEMANDS A MULTIVERSE

LANGTAGING IS A BODY ENCOUNTER, A PARTICULAR CHOREOGRAPHY OF THE DANCE OF BODY ENCOUNTERS WE TOUCH EACH OTHER, PUSH, CARESS, ETC. & WE DO THIS WITH WORDS. THE ENCOUNTER IS NOT NECESSARILY LIKE GRABBING MY ARM; WORDS PRODUCE CHANGES IN THE NERVOUS SYSTEM, THE BRAIN, AS WE USE AN UNDERSTAND THEM, & THIS IS A CHANGE IN THE BODY.

CONVERSATIONS TAKE PLACE IN A FLOW OF EMOTIONS.
NOTHING HAPPENS WITHOUT AN EMOTION THAT SPECIFIES THE GROUND ON WHICH IT CAN HAPPEN.
AN EMOTION IS A PARTICULAR DISPOSITION FOR ACTION.
OR CALL IT A PASSION. SO WE ARE PASSIONING, CONTINUOUSLY FLOWING FROM ONE PASSION TO ANOTHER.
FAMILIES ARE DEFINED UNDER THE PASSION OF LIVING TOGETHER, IN PHYSICAL AND EMOTIONAL PROXIMITY.
YOU CAN HAVE A SITUATION OF CONTRADICTORY PASSIONS: TO BE TOGETHER, APART. (RECURRENT) CONVERSATIONS TRIGGER THESE PASSIONS. IF THEY ARE OF THE FORM OF OBJECTIVITY WITHOUT PARENTHESES — "YOU ARE LAZY," OR "YOU NEVER BRING ME FLOWERS" (AS IF A PROMISE EXISTED — YOU ARE ASKED TO DO SOMETHING YOU DIDN'T WANT TO DO, THREATENED IN YOUR IDENTITY. ALL SUCCESSFUL FAMILY THERAPIES ARISE WHEN A FAMILY BEGINS TO PUT OBJECTIVITY IN PARENTHESES, & BEGINS TO LIVE IN A MULTIVERSE RATHER THAN A UNIVERSE.

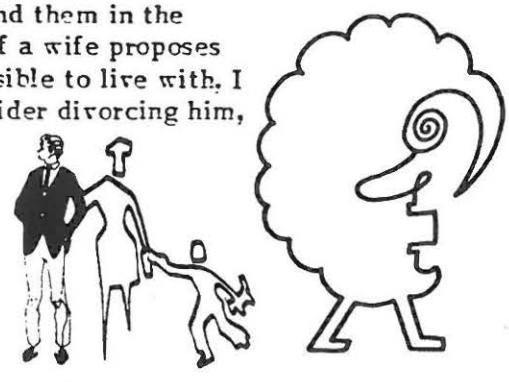
CYBERNETICS OF THE ABSURD

by Bradford P. Keeney, Ph.D.
Director, Family Therapy Program
Texas Tech University

Therapist:
(Keeney) My dear cybernetician, what do you mean by the expression, "cybernetics of the absurd?"
Cybernetician:
(von Foerster) Knowing you, it must refer to a pattern of which you're often a part.
Ther: What question must I ask to be a step closer to a cybernetic understanding?
Cyb: What do you mean? Let's try it this way: Is cybernetics absurd? Or, is an experience of the absurd cybernetic?
Ther: Let's assume I keep asking you about the meaning of cybernetics and my responses repeatedly suggest that I'm just not getting it. After a while, you get so bored that you fall asleep. Let's imagine three different outcomes that could occur if this were to happen. While you're asleep, I might ask myself what happened in our conversation. I could point out that we were talking about the meaning of cybernetics as well as examining whether the pattern that connected our conversation was cybernetic. Perhaps this would lead to understanding that your falling asleep was a calibration or corrective change of our interaction. If so, would I discover and experience what cybernetics is about. Whatever the case, I believe there's quite a bit of absurdity in all that. First of all, taking a nap on your part is rather ridiculous, but perhaps not as absurd as my trying to figure out whether your nap is connected to me in a way that exemplifies what we were trying to talk about.
Cyb: And would you also say that there's the absurdity of our talking about all of this right now? Perhaps one of us will fall asleep and dream of what else we could be doing.
Ther: That brings us to the second possible outcome. Namely, if you did fall asleep in our conversation you might have a dream. The dream, following our line of reasoning, could also calibrate our conversation and thereby provide a difference that would lead us to a new understanding of both cybernetics and the absurdity of experiencing cybernetic patterns.
Cyb: What is the third possible outcome?
Ther: I forgot. I must have been dreaming.
Cyb: How does this way of talking connect with what you do in therapy?
Ther: If I notice that I'm bored in therapy, I immediately do something vastly different from what I had been doing prior to my experience of being bored. I might actually fall asleep, construct a fantasy or complain to the family that they're boring me. My experience of boredom therefore becomes useful: it perturbs or invites me to do something different.
Cyb: Which, in turn, may provoke the family to be different.
Ther: Yes. Perhaps "cybernatics of the absurd" is simply a way of talking about how one can recycle one's own experience to create a different experience. I can use the experience of boredom, for instance, to provoke a disagree-ment. That disagree-ment, in turn, can be recycled to construct an experience of intimacy. And on and on. One may go round and round the sides of whatever the organ-izing distinction happens to be: love/hate, closeness/distance, we-ness/I-ness, involvement/boredom, beauty/ugliness, and for some cyberneticians, autonomy/control.

Perhaps "cybernetics of the absurd" is simply a way of talking about how one can recycle one's own experience to create a different experience.

Cyb: What do you think of recursion with respect to the distinctions you experience in therapy?
Ther: In my work, I have a special advantage working with families. Namely, any experience, behavior, or communication preposed by one family member can be viewed as connected to another member's experience in a complementary fashion. A depressed father, for instance, may report his experience in relation to another family member, say a mother or grandmother, who is chronically optimistic. Families provide a choreography of complementary distinctions that unfold in front of the eyes of a therapist. The art of therapy is participating in the weaving of these patterns.
Cyb: How do you do that?
Ther: One way is to accept the client's communications and extend them in the direction of the absurd. If a wife proposes that her husband is impossible to live with, I can propose that she consider divorcing him,



hiring someone to beat him up, or devise a plan to murder him. I can then go on to discuss what his funeral would be like and who in the family would have the most to gain by his being knocked off. If anyone were to question what I was doing, I would hold my ground and insist that I'm doing my best to be helpful.

Cyb: You're being helpful in the sense that the problematic communi-cation is encouraged to run toward a reductio ad absurdum. How do you know what should not be accepted and extended toward the absurd?

Ther: The pattern connecting you with the family can calibrate you. It is best to let that order of recursion, sometimes called "unconscious mind," guide and organize therapy.

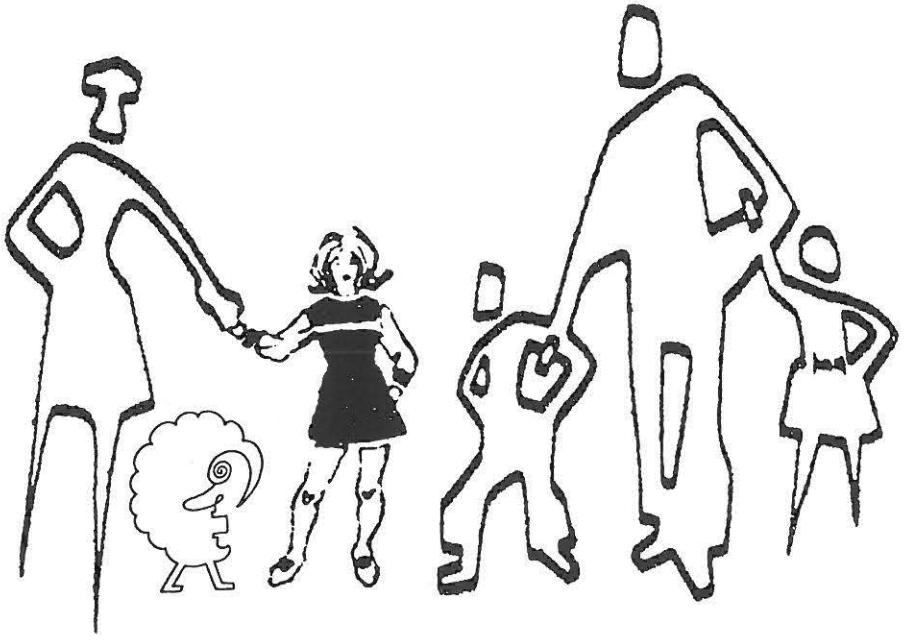
What we're saying is that semantics and politics are two sides of the systemic coin named communication.

Cyb: But how do you calibrate yourself to be in a position to be calibrated by that order of unconscious mind?

Ther: I'm a bit confused since I don't experience myself in therapy as purposefully constructing what happens in therapy.

Cyb: I can still see you prescribing a therapeutic reality that includes the idea that you have no awareness of your participation in constructing it.

Ther: I was recently at a conference where people kept going round and round notions concerning the observer's participation in his or her observing. We took seriously your invitation to make a paradigmatic leap toward emphasing the observing system.



However, time and time again we got bogged down in reminding each other that we are always actively participating in our observing whether in the domain of studying infant-child interaction, discourse analysis, the study of primate behavior, or psychotherapy.

Cyb: Yes, yes. You see the getting stuck in thinking about this shift can be approached differently if we remind ourselves that what we are talking about concerns how we relate to the relation between observing and observing our observing.

Ther: As a musician, I would never want to take into account how I'm participating in the construction of music while I'm playing. That would be a disaster.

Cyb: I would certainly hope not — I wouldn't want to hear that. But my questions for you would be more precisely stated as: When and how do you take into account the relation between playing music and playing with how you play music?

Ther: So the distinction between emphasizing observed systems and observing systems is not cast as an either/or choice?

Cyb: They must be kept distinct so as to keep open the possibility that their difference can make a relevant political difference.

Ther: What do you mean by a political difference?

Cyb: This is a very important question. Several years ago I wrote a brief paper about Gregory Bateson's contribution to understanding communication and suggested that he was less interested in semantics and was more committed to exposing the functional, interactional, strategic, and political consequences of com-munication.

Ther: This was the point you made earlier in the week about "instinct" and "gravity." You referred to them as "explanatory principles" which are politically used to punctuate a conversation.

Cyb: Yes, indeed. Explanatory principles are invitations to stop thinking any more about a particular phenomenal domain.

Ther: But, isn't the distinction between semantics and politics itself a consequence of having made a semantic distinction?

Cyb: I am talking about your making that difference. That is politics.

Ther: To name that communicational frame of reference that is not principally concerned with semantics requires a semantic frame to make the indication.

Cyb: What we're saying is that semantics and politics are two sides of the systemic coin named communication.

Ther: As systemic therapists know, any construction of meaning implies political consequences and any specification of politics carries with it particular meanings. If the meaning of symptomatic behavior is defined in terms of social relationship systems rather than an individual's endocrine system, the politics of therapy will be markedly different.

Cyb: The very name of your field, "family therapy," is itself a semantic change that has reorganized the politics of therapeutic conduct.

Ther: This distinction between semantics and politics also enables us to untie some fascinating knots of communication.

Cyb: With semantics and politics you have a powerful distinction that enables you to unpack how particular communicational frames are co-constructed and co-woven by therapists and clients to construct unique therapeutic realities.

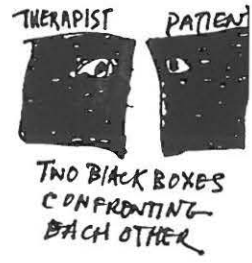
Ther: This is actually the work I've been involved with for several years. If we had time, I would demonstrate how this distinction operates on itself to generate different orders of observation, moving from descriptions of simple action to interaction to social choreography. Within that view of multiple views my colleagues and I have generated what we term a "periodic table of therapeutic eigen maps." Here the basic forms for managing therapeutic discourse are set forth. As you would see, the art of therapy, any therapy, involves speaking through recursively-linked multiple voices, perspectives and kinesthetic experience.

Cyb: My prediction is that such an understanding would radically shift how you regard what clients and therapists call "problems." For you, as a systemic therapist, there could be no "real problems." Rather these are "constructed problems" that, in turn, have "constructed consequences." In other words, "problem" is a semantic frame that carries political consequences.

Ther: As a demonstration of this constructivist position, imagine asking a client about his or her problem. Independent of the client's particular response, imagine subsequently responding with the question, "Please, what is your real problem?" More than likely, the client will offer a different semantic frame. As a further step, consider responding with the question, "As I now speak to your unconscious mind, what is your deepest and most basic problem?" Again it is likely that the client will construct an entirely different semantic definition of a problem. The question for an observer of this scenario is: "Which of the client's responses indicates the 'real' problem?"

Cyber: Similarly, views of therapeutic outcomes are constructed. Asking a client what happened in therapy can always be followed by asking what really happened, and so on. In this way, clients and therapists always construct the meanings and subsequent political consequences of their situation.

Systemic therapy has little to do with medicine--it is within the domain of rhetoric and dialogue



Ther: In conclusion, the view we are building enables all communication to be utilized in a generative fashion. Knowing that any particular response can be seen as a description about part of a more encompassing pattern enables the therapist to address the implied parts. In this way therapeutic dialogue is generated.

Cyb: I am happy to report that systemic therapy has little to do with medicine — it is within the domain of rhetoric and dialogue. Rather than offering cures and solutions, alternative realities are built which transform the meaning and politics of the people who are part of it, including family members and therapists.

Ther: I think you can appreciate why therapy can't be taught in a trivial manner. What you have are semantic and political frames that provide an invitation for an infinitude of possibilities. But we might get bored someday with this distraction.

Cyb: I'd then have to find other therapies and phenomenal domains to examine and construct, other distinctions to draw, or change my job.

Ther: Now our jobs sound alike: We're both trying to escape being bored. You see, we're talking about more than therapy or cybernetics. We're talking about how to be alive.

Cyb: Is there any advice for how cyberneticians and therapists can remain alive?

Ther: Following the suggestion of a fellow family therapist, Carl Whitaker, I would at least suggest that we position all significant others to second place. In other words, whatever is held as most significant, whether people, ideas, experience or habits of research, practice shifting them to second place. We may even find ourselves relegating this very rule to second place. Again, a world that oscillates, shifts in and out, back and forth in recursive fashion, recycles, or cybernetically feeds off itself is a more interesting place to live.

Have a psychotic experience; have another psychotic experience, and get over one of them.

Cyb: I'm reminded of some advice Margaret Mead once proposed when she was asked for a recipe for how to get insight, or in our perspective, how to keep alive. She said: (1) study infants; (2) study animals; (3) study primitive people; (4) be psychoanalyzed; (5) have a religious conversion and get over it; (6) have a psychotic episode and get over it; and (7) have an affair with an old Russian.

Ther: Let's recycle her recipe to read this way: (1) learn to love infants and never get over it; (2) learn to love animals and never get over it; (3) learn to love what is primitive about people and never get over it; (4) be in therapy and get over part of it; (5) have a conversion, religious, therapeutic, ideological or otherwise, and get over part of it; (6) have a psychotic experience; have another psychotic experience, and get over one of them.

"Believe me, I'd love to explain my work in lay terms, but I don't know any lay terms."

Cyb: You forgot having an affair with an old Russian.

Ther: You'll have to help me with the old Russian. What does that have to do with insight and growth?

Cyb: Perhaps she remembered Gregory Bateson's remembrance of the wisdom of always keeping unobscure the vast darkness of the territory.

Ther: Perhaps it has to do with reverence for being suspicious of our habits.

Cyb: That is cybernetic advice.

Ther: Perhaps we need to apply this advice to our present conversation.

Cyb: I want to ask a final question. What difference would it make if family therapists and cyberneticians attempted to construct a context that embodied the very ideas they propose?

Ther: Would our journals, professional books, academic programs, and conferences be the same?

Cyb: How could they be the same?

Ther: What difference would it make?

Cyb: The fields might learn to die.

Ther: They might also learn to play.

Cyb: Do therapists and cyberneticians experience and participate in their absurdity?

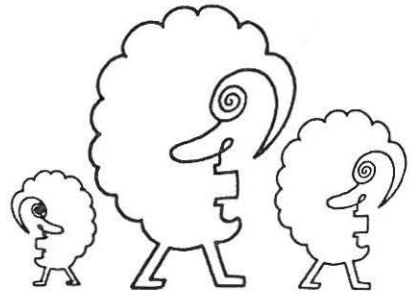
Ther: More importantly, do they use their experience of the absurd to connect and correct the larger patterns that organize them?

Cyb: Have we?

Ther: Would it be cybernetic if I replied yes or no?

Cyb: Would it be absurd for me to say that I know?

Ther: Let's wait to hear from our friends.



MEANING IS ALWAYS A REFLECTION ON THE PRESENT

MATURANA ON EXPLANATION

WE HAVE EXPLANATIONS FOR EVERYTHING, EVEN WHEN WE CLAIM WE DONT. I CALL EXPLANATIONS PACIFIERS, TO STOP ASKING QUESTIONS. THE QUESTIONS ARE EMOTIONS, WE ARE MOVED TO ASK. BUT EXPLANATIONS ARE MAGNIFICIENTLY SUPERFLUOUS. WE DONT NEED THEM TO LIVE. WE LIVE DIFFERENTLY IF WE HAVE THEM, BUT WE DONT NEED THEM TO LIVE

AN EXPLANATION DOES NOT REPLACE THE EXPERIENCE

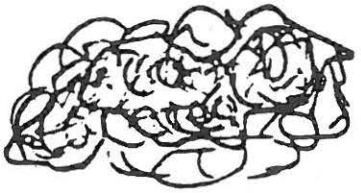
THE NOTION OF (OBJECTIVITY) HAS TREMENDOUS POLITICAL IMPLICATIONS

KNOWLEDGE IS A DEMAND FOR OBEDIENCE IF I HAVE KNOWLEDGE, YOU MUST AGREE. IN AN (OBJECTIVE) DOMAIN, IT IS LIKE CHESS, WE HAVE A SET OF RULES IN A DOMAIN - IF YOU DONT WANT TO PLAY WE CAN CHANGE DOMAINS (+ RULES) OR SEPARATE. IT IS NOT A QUESTION OF TRUTH

HUMBERTO > NONE OF THESE QUESTIONS CAN BE ANSWERED UNLESS WE CONSIDER LANGUAGE + COGNITION:

WE CAN ONLY KNOW BY INTERACTION;

COGNITION IS EFFECTIVE ACTION IN SAME DOMAIN



HWF: COGNITION + LANGUAGE ARE PROBABLY TWO SIDES OF A COIN - SO ONE MAY ASK, WHAT IS THE COIN? IT MAY BE CONSCIOUSNESS, OR CONSCIENCE, OR LOVE. IT IS AS IF WE ARE OR ETHICS,

DEALING WITH CLOUDS ON THE HORIZON THAT ARE CONSTANTLY CHANGING THEIR FORM, BUT WE SHOULD NOT CONSIDER THIS A DIFFICULTY, WE SHOULD RIDE ON THE CLOUDS. WE SHOULD NOT FEEL THEY LET US DOWN, THEY LIFT US UP!

POEMS

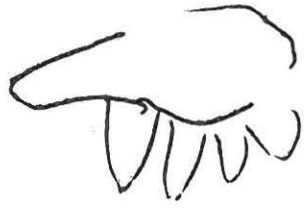
BRIAN K. RUSHFORD

DON'T STEP ON THE HONEYBEES

We walk barefoot in the field, Wayne and I
bat, glove and ball in hand
careful, though, don't step on the honeybees

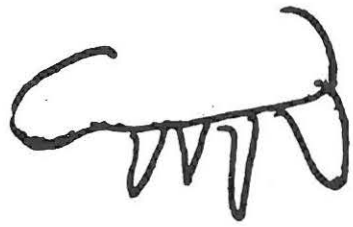
ON THE FRINGE OF THE SWAMP

Every inch of my body
is salty wet
and I can smell
the vegetation rotting out from beneath me —
and frogs the size of nickles
roar out their delight
at the dripping night moon.
And it is so hot this evening
that I can almost smell
the perspiration from the mosquito's legs
as she labors
for my blood.



LITTLE PIECE OF WORM

Tramping through the
skunk cabbage
when I come upon,
by a rotted log,
a little piece of worm
halfway in a hole.
it twitches 3 times
and then is still
and I wonder
as a wormsoul
goes to heaven or
hell
what happened to the
rest
of the little chap's
body
then I hear a big crunch
and a gulp
and I meet a
starling's eyes
he gives me a
quick wink
and flies away,
whistling.



PASTURE

I could sit here forever
and listen to myself
talk to myself
about
the cow pasture.
The shrubs with
the footprints
the salt licks
I know the cows travel
throughout the pasture
but I never see them move
from the roadside
where they engage in countless staring contests
with passers by
contests which the cows always win.

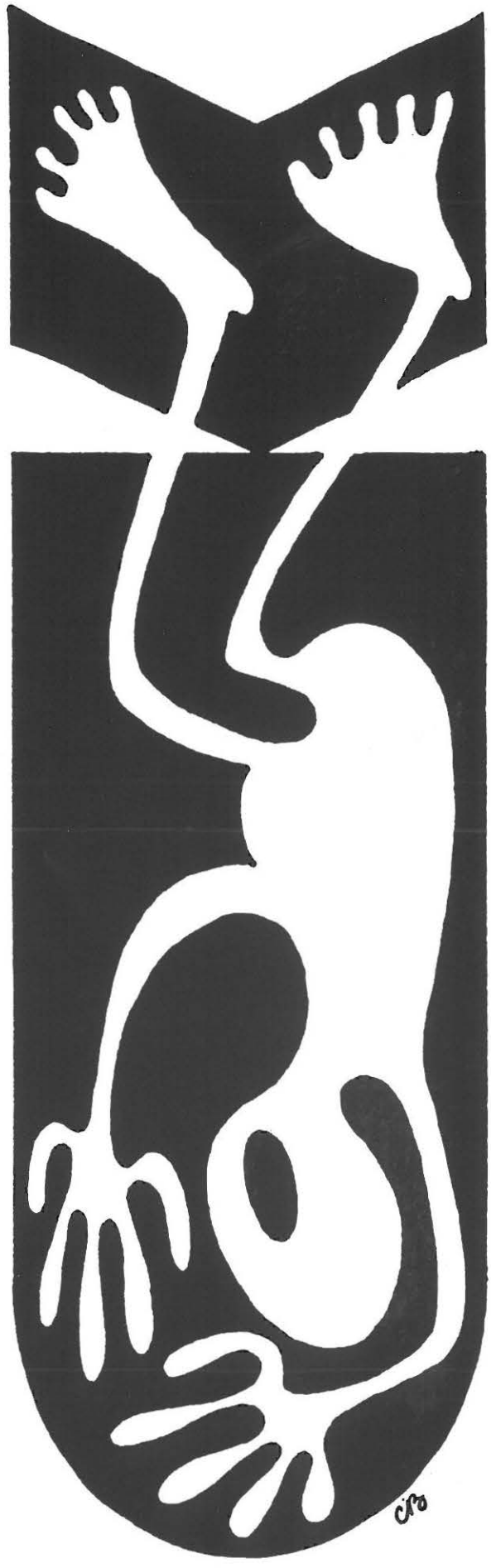
EGO MAPLE

that there maple
over yonder
used to produce a lot of syrup ...
but....
it happened to learn this
and had a bird or two tie a blue ribbon round its trunk
and, since, has given no syrup
at all

THE INVERSION OF MASTERY

by Edward E. Sampson
The Wright institute

This paper appeared in a collection titled The Dark Side of Science, proceedings of the 63rd Annual Meeting of the Pacific Division, American Association for the Advancement of Science, Vol. I, Part 2, Aug. 30, 1983; edited by Brock K. Kilbourne and Maria Kilbourne.



Let me frame the following paper between two contrasting themes, one reflecting the tasks of mastery, the other its inevitable inversion when it alone dominates. The first theme was presented most crisply in the late 1500s and early 1600s by Sir Francis Bacon. He both captured the spirit of the Western worldview and simultaneously set the tasks for which we are still engaging the most substantial investments of our world and human resources:

> the sovereignty of man lieth hid in knowledge...now we govern nature in opinions...we should command her by action...knowledge that tendeth but to satisfaction, is but as a courtesan, which is for pleasure, and not for fruit or generation...or...arguments, but in effecting and working... (from Horkheimer & Adorno 1972, pp. 3,4,5)

This Baconian view of knowledge should be familiar to all of us. We are guided by it in our daily practice. Each psychology's research affirms mastery as a central motive in all human life, perhaps as fundamental to human survival as the very air we breathe. As Bertrand Russell (1945) noted, to Bacon goes the credit for joining knowledge with power, control and domination. Through science and technology, man would come to dominate the unruly forces of Nature and so clearly establish his sovereignty.

The second theme emerged in the Western world most clearly in the writings of the group known as the Critical Theorists of the Frankfurt School of Social Research, including Max Horkheimer (1972, 1974), Theodor Adorno (1973), Herbert Marcuse (1964, 1977) and more recently Jurgen Habermas (1971, 1973). This theme has similarly become a central element in several more recent feminist (e.g., Merchant 1980; Spretnak 1982) and ecologist (e.g., Berman 1981; Bookchin 1982) publications.

Reflecting on the Baconian view of knowledge as mastery and as the driving force behind the age of Enlightenment and the rapid rise of modern Western science, Horkheimer and Adorno write of the self-destructing patriarchy that worldview represents. Even Bacon's choice of terms reveals the patriarchy that lies at the center of this notion: nature is female, even a courtesan; she is to be ruled by the men of science and technology who will wrest her secrets from her in order to demonstrate their own sovereignty.

Writing their massive joint work, Dialectic of Enlightenment in 1944, Horkheimer and Adorno's opening sentence outlines their concern and their project:

"The Enlightenment has always aimed at liberating men from fear and establishing their sovereignty. Yet the fully enlightened earth radiates disaster triumphant." (p. 3)

Somehow, the hope that the knowledge gained in order to achieve mastery would free humanity from its era of superstition and enslavement became inverted: the massive accumulation of such knowledge only further entrapped humanity. Listen to Horkheimer (1974):

"If by enlightenment and intellectual progress we mean the freeing of man from superstitious belief in evil forces, in demons and fairies, in blind fate – in short, the emancipation from fear – then denunciation of what is currently called reason is the greatest service reason can render." (p. 187)

In these few passages, Horkheimer and Adorno describe what can be referred to as the inversion of mastery. The tasks of mastery over nature demand a kind of patriarchical and commanding relationship between people and nature that fosters an instrumentalized process of reasoning and thinking; that is, reasoning is employed as an instrument or tool designed to accomplish the ends of greater control over a particular phenomenon. As that process dominates humanity and comes to define and organize the entirety of human knowledge, we see the inversion from mastery into submission.

The tasks of mastery over nature demand a kind of patriarchical and commanding relationship between people and nature that fosters an instrumentalized process of reasoning and thinking... Everything is defined in terms of technique and control, only technically utilizable knowledge counts.

Everything is defined in terms of technique and control, only technically utilizable knowledge counts. As problems mount, they are addressed in terms of the same instrumentalized reasoning that produced the problems in the first place. As we will see, the remedy has become the poison; as its dosage is increased, the patient becomes even sicker.

Instrumental Reason

The key to the Critical Theorists understanding of the transformation of knowledge from remedy to poison is based on the notion of instrumental reason. Horkheimer defined this type of means-oriented reasoning as being primarily concerned with "the adequacy of procedures for purposes more or less taken for granted and supposedly self-explanatory" (Horkheimer 1974:3). To think instrumentally is to be concerned with the coordination of means to ends, not with the ends themselves.

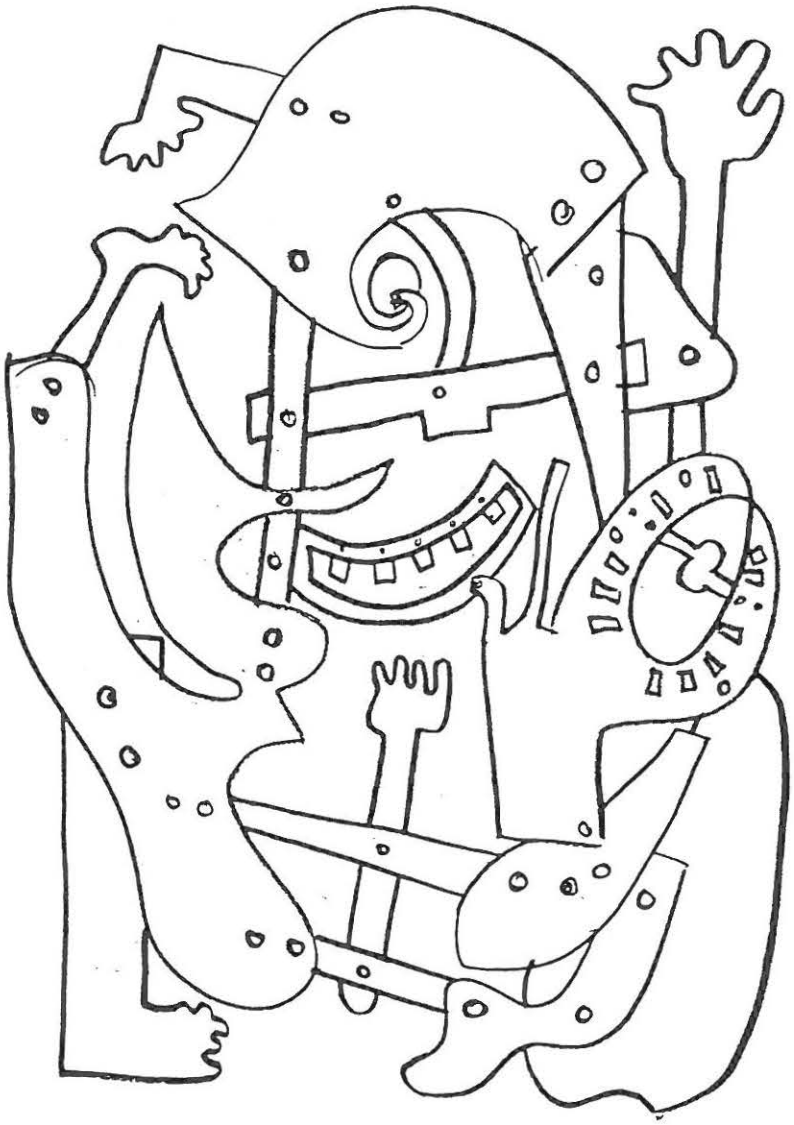
A clear example of this notion is presented by the economic historian, Karl Polyani (1957):

> Rational action is here defined as choice of means in relation to ends. Means are anything appropriate to serve the end, whether by virtue of the laws of nature or...the laws of the game.

Thus "rational" does not refer either to ends or to means, but rather to the relating of means to ends. It is not assumed, for instance, that it is more rational to wish to live than to wish to die... For whatever the end, it is rational to choose one's means accordingly.... Thus it is rational for the suicide to select means that will accomlish his death. (pp. 245-246)

Any organism that destroys what it takes to be its other, not recognizing itself in that other, lays a firm foundation for self-destruction.

The argument mounted by Horkheimer, Adorno, Marcuse and Habermas suggests that the definition of rationality in terms of instrumentality—derivative from the Baconian directive—limits understanding to forms that coordinate means to ends. It stresses the notion that facts exist as neutral attibutes of the world to be used either for good or for evil. The latter, however, because they involve questions of value and preference, lay beyond the purview of science which deals only with "what is," not with "what ought to be."



Dan Oliver

How facts will be employed, in whose interests and towards which ends, thereby involves questions said to be beyond proper science. However, as the Critical Theorists note, the facts that are gathered under this instrumentalized frame are hardly disinterested and neutral; they are guided by the patriarchical-instrumental-mastery interest in knowledge. A fact is a fact only insofar as it pertains to something that is technically utilizable, in the service of mastery and control. The only legitimate forms of knowledge become those which are geared to achieve such ends. Yet, these ends are deleted from critical reflection and so creep in as an unnoticed bias or interest.

Basically, a partriarchical perspective wins in the guise of a value-neutrality that rules out other interests except its own, which, however, it fails to recognize in the first place. Mastery as the remedy becomes the poison. In ruling out other ends besides its unrecognized-own, all that is presumed in its terms to be unruly in nature must be dominated. And, any organism that destroys what it takes to be its other, not recognizing itself in that other, lays a firm foundation for self-destruction. This latter point is developed more fully in later sections of this paper.

A Gentler Attitude

Before leaving this overview of the contrasting themes that mark the boundaries of my discussion, let me briefly quote a passage buried in the middle of a Psychology Today (Gardner 1981) interview with Howard Gruber, a psychologist whose recent works have provided an insightful understanding of the life experiences of several creative scientists. Gruber was attempting to answer a question about why some societies (e.g. Japan) produce so few Nobel Laureates, while others dominate. Gruber suggested that the answer might lie in a different view of the relationship between people and nature:

> Suppose you have a view of man as a participant in nature rather than a master of it, the usual Western notion. For the intellectual tasks we've had up to now, that may not be a very fruitful approach. But I leave open the possibility that a gentler attitude towards nature may turn out to be more illuminating and more fruitful in meeting our future needs. (p. 70)

This is an intriguing statement. One the one hand, it affirms the Baconian view of man as the master over nature, at least for one period of Western history. On the other, it reflects an alternative possibility suggested as well by the Frankfurt theorists: namely what once worked so well has now turned about to threaten. Another relationship between humanity and nature may be essential in the years ahead, what Gruber terms, a gentler attitude.

A Radical Deconstruction

So that the dimensions of my commentary can be reasonably clear at the outset, let me briefly observe my own understanding of the deconstruction of mastery that is called for. A major consequence of the Enlightenment was the transformation of the source of the authority for knowledge from the Church to empirical science. This change in source, however, failed to change the form that subsequently developed (see Sampson 1978, 1981). The worldview of the Church was patriarchical. The Enlightenment, while challenging the Church's authority and replacing it with the rationality of empirical science, failed to transform that patriarchical hierarchy. The improvement was substantial and not to be slighted; yet it did not undermine the mastery theme that has marked Western religion and Western science as a fundamental element in its worldview.

Deconstructing that hierarchy does not entail substituting another in its place. Rather, any meaningful transformation must necessarily get to the very heart of the matter itself: hierarchies and privileging must be set aside to be replaced by views of knowledge that recognize differences but in no way demand that one form be declared the winner over others.

For example, the dominance of a patriarchical framework threatens survival as its inversion undoes whatever benefits flow from the concept of progress-as-control that it advocates (see Bookchin 1982; Schell 1982; and Wilden 1980 for several arguments that develop this point). And yet, when that frame is cast aside completely, survival and well-being are likewise threatened. The challenge then is not to replace the mastery theme by some purely gentle and receptive outlook, but to generate structures within which dominance hierarchies are absent and various interests gain an equal hearing in practice.

A gentler attitude towards nature may turn out to be more illuminating and more fruitful in meeting our future needs.

Having said that, let me also observe that those of us who are concerned with instituting such a change operate within an already dominant hierarchy. The press for an alternative will inevitably appear to be contrary to what I have just said. The quality of argumentation emerges whenever one must employ the framework to be undone in its undoing. This aim is not to repeat past history in which sources changed but patriarchical forms were retained, even if the arguments on behalf of a change appear to be cloaked in that one-dimensional rhetoric.

The Enlightenment, while challenging the Church's authority and replacing it with the rationality of empirical science, failed to transform that patriarchical hierarchy.

Deviance In and Of Science

Now, what does all of this have to do with deviance in and of science? A great deal. I have been describing the transformation of a remedy into a poison. I suggest that the passion for patriarchical mastery not only drives the deviant behaviors within science (e.g., fraudulent reporting of data) but also the deviance that the narrowed and unexamined tenets of science-as-scientism has become. The "in" and the "of" do not refer to two independent events, but rather emerge from the same worldview and underlying social system within which science itself dwells.

The first, deviance within science, describes a pursuit of winning at any cost: govern and control with an iron hand even if that requires distorting and suppressing the unruly moments that inevitably appear. The second, the deviance that is of science,

Dan Oliver

represents a fundamental distortion in values that occurs when only one framework becomes valid for defining knowledge and cannot be applied critically to uncover the values that undergird and support that framework itself.

So that this will not be an excessively abstract discussion, I will call upon three examples from the human sciences that I believe illustrate what I mean when I speak of th inversion of mastery. These examples reveal the combined effect of deviance in and of science. The patriarchical perspective is apparent in these examples in several senses of that term: not only is the attitude one of mastery but in addition it is applied specifically in order to achieve a kind of patriarchical mastery over those groups and persons who have symbolized nature or its potentially unruly qualities.

The first example involves sexual bias, the second, racist bias, the third, class bias. There are good reasons for a patriarchically governed science to be driven to distort or destroy those elements of the human world that challenge the hegemony of the patriarchical-instrumentalized worldview. Each case example illustrates the profound meaning of deviance in and of science when the illusion of objectivity blinds those who use it to achieve the culture's implicit goals as though the "facts" in each case were self-evident.

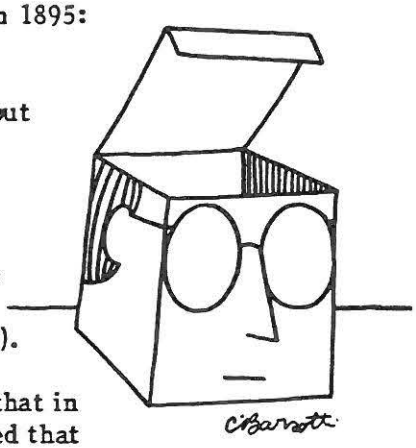
Sex Bias. By the 19th Century, some key philosophers had laid a clear foundation, seconded heartily by the patriarchical religion of the Judeo-Christian tradition, for the belief that women were inferior to men (see Shields 1975 for the basis for much of the material in this section; also see Merchant 1980). It was up to the scientists of the time to conduct systematic research that would demonstrate the objective facts of the case. What passed for science in the late 1880s, however, seemed more often like a circus sideshow than science as we now know it. Nevertheless, the major phrenologists of the time, Gall and Spurzheim, reasoned that if the male and female bodies differed, then surely the male and female brains should likewise differ. In particular, those parts of the brain that involve higher thought processes should have a greater and more visible development in men than in women; the latter should show greater development in areas said to be involved with feelings and emotions.

It was not difficult to find affirming results by taking readings of the bumps on the heads of men and women. But it awaited more stringent scientific tests, especially those involved in brain weight and brain localization, to put the matter to what would seem a more proper test. Several investigators concluded that the male superiority appeared most clearly in a weightier brain. Others performed careful dissections and discovered that the male brain was more developed in the frontal regions—where higher thought processes were presumed to be located—while the female brain was parietally dominant—where more primitive functions were served. Let me note, only parenthetically, that when still later investigators suggested the key role of the parietal regions in higher thought processes, it was necessary to rethink the earlier findings showing female parietal dominance so that they would be congruent with the belief that males were dominant in those regions responsible for higher thought.

The challenge then is not to replace the mastery theme by some purely gentle and receptive outlook, but to generate structures within which dominance hierarchies are absent and various interests gain an equal hearing in practice.

As Shields (1975) observes, this change required some dramatic revisionism as revealed in the following quote from 1895:

> the frontal region is not, as has been supposed small in woman...but the parietal lobe is somewhat smaller...a preponderance of the frontal region does not imply intellectual superiority...the parietal region is really the more important (from Shields p. 741; originally quoted by Patrick 1895).



This is quite a revision considering that in 1854 a neuroanatomist had concluded that women are homo parietalis while men are homo frontalis in order to affirm male dominance in higher thought.

I hasten to note that these earlier investigations did not simply go away with the passage of time or with the sophistication of new methodological techniques; they remain in modern garb with us today. Many men of science still work diligently to demonstrate that the culturally and historically constituted differences between men and women are entirely linked to differential brain structures.

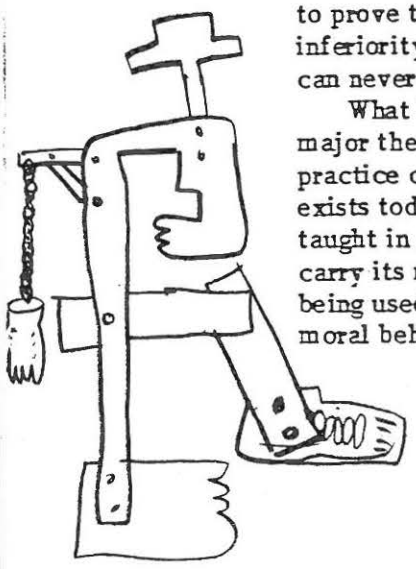
I have suggested that in the single-minded pursuit of mastery, the pursuer becomes the pursued, trapped by the very lures and snares established to catch and dominate the presumed "enemy."

Thinking and Reasoning. One need not probe brain neurophysiology to uncover scientific work that in its own way affirms the superiority of the male worldview. Far more subtle efforts have recently emerged within the psychological study of reasoning processes, moral reasoning in particular (e.g., Kohlberg 1968, 1969).

Suppose that one could uncover a sequence of cognitive development that moves from a more primitive (should we say, nature-like?) to a more advanced form (shall we say, un-natural?). Suppose further that the primitive form is said to reason in terms of concrete human relationships, whereas the advance form reasons by means of abstract and formal-logical principles. And finally, suppose that the determination of a person's standing along this developmental scale systematically scores thinking that reasons in terms of human relationships and human connections—often given by females—as lesser than thinking that is abstract and formal—of the type more often given by males (e.g., Gilligan 1977).

What is so subtle about this form of bias is that it adopts its own framework as the model of higher thought and then uses that model to affirm itself while placing all other forms at inferior positions along a developmental scale. The rules by which the game will be played are set. The key feature of these rules is that whenever they are employed, one side will necessarily be declared the winner of the game. Furthermore, the rules also set the standards by which any other rules are to be evaluated. Finally, the same rules implicitly deny as relevant any values other than those involved with technical mastery and control. Yet, this denial occurs without being recognized as such. All of this provides a surefire way to prove the prowess of one side and the inferiority of the other as long as the rules can never be seriously questioned.

What I have just described is perhaps the major theory and program of research and practice on reasoning and morality that exists today. This is a program that is being taught in schools to teachers who will then carry its message to their students; it is even being used to instruct various groups on moral behavior. Elsewhere, I have argued that the so-called highest stage of moral reasoning corresponds not coincidentally to the patriarchical worldview (see Sampson 1977, 1978); it implicitly adopts this view as the standard by which to measure and evaluate all other forms. Thus, it employs hierarchy rules, yet does so as though it were objective and hence natural and neutral, a mere description of the world as it is.



While I believe that the main point is by now reasonably apparent, many additional examples of this patriarchical worldview have been recently noted. For example: (a) the sociologist Jessie Bernard's (1982) recent commentary on the patriarchical versus a contrasting view of pre-human primate life; (b) the historian Gerda Lerner's comment (Hook 1981) on the periodization of history in terms of patriarchical categories of war, conquest and domination; and (c) Merchant's (1980) excellent and detailed analysis of the other side of the Scientific Revolution and its notion of progress.

Socially and historically, the world of the female has represented the world of nature. This describes a world that in the last several centuries, during which time industrialization, widespread capitalism and scientism grew enormously and held sway over the lives and the imagination of the Western world, had to be dominated, tamed and ruled. Indeed, the deviance both in and of science, in my view, offers reams of testimony to the distortions and self-destructing quality that has emerged as the patriarchical worldview has been relentlessly pursued throughout the history, both past and present, of Western Civilization.

Immigrants and Racist Bias. At the turn of the century, the united States witnessed substantial immigration from European nations. Although these immigrants were both eagerly sought in order to work the developing factories and to populate the still sparsely settled land, they were also feared for their differences and their potential pollution of the good American stock. Years earlier, Francis Galton, for example, had suggested an innate intellectual inferiority among the races, especially Blacks (Samelson, Note 1). Needless to say, when the first white settlers (the Puritans) were the actual immigrants to the United States, they sustained racist attitudes towards the Native Americans they encountered.

However, they employed religious rhetoric rather than intelligence testing to affirm their beliefs that they, the white settlers, were the chosen people. The existing native populations were said to be the inferiors to be tamed, the "villains in a sacred drama" to be conquered and destroyed (see Segal & Stineback 1977).

In the early years of the 20th Century (1910s-1920s), as immigration substantially increased, Congress sought to limit the influx, but especially of certain types from certain nations. They found ample support among several prominent social scienctists for the belief in a basic inferiority of certain immigrant groups. For instance, in 1913, Henry Goddard was invited by the U.S. Public Health Service to go to Ellis Island and to administer the Binet-Simon intelligence test to samples of arriving immigrants (see Bem 1975). His data revealed that 83% of the Jews, 80% of the Hungarians, 79% of the Italians and 87% of the Russians were clearly feebleminded (see Dorfman 1982; Kamin 1974, 1982 on these findings). However, Goddard saw this population of feebleminded to be potentially useful because:

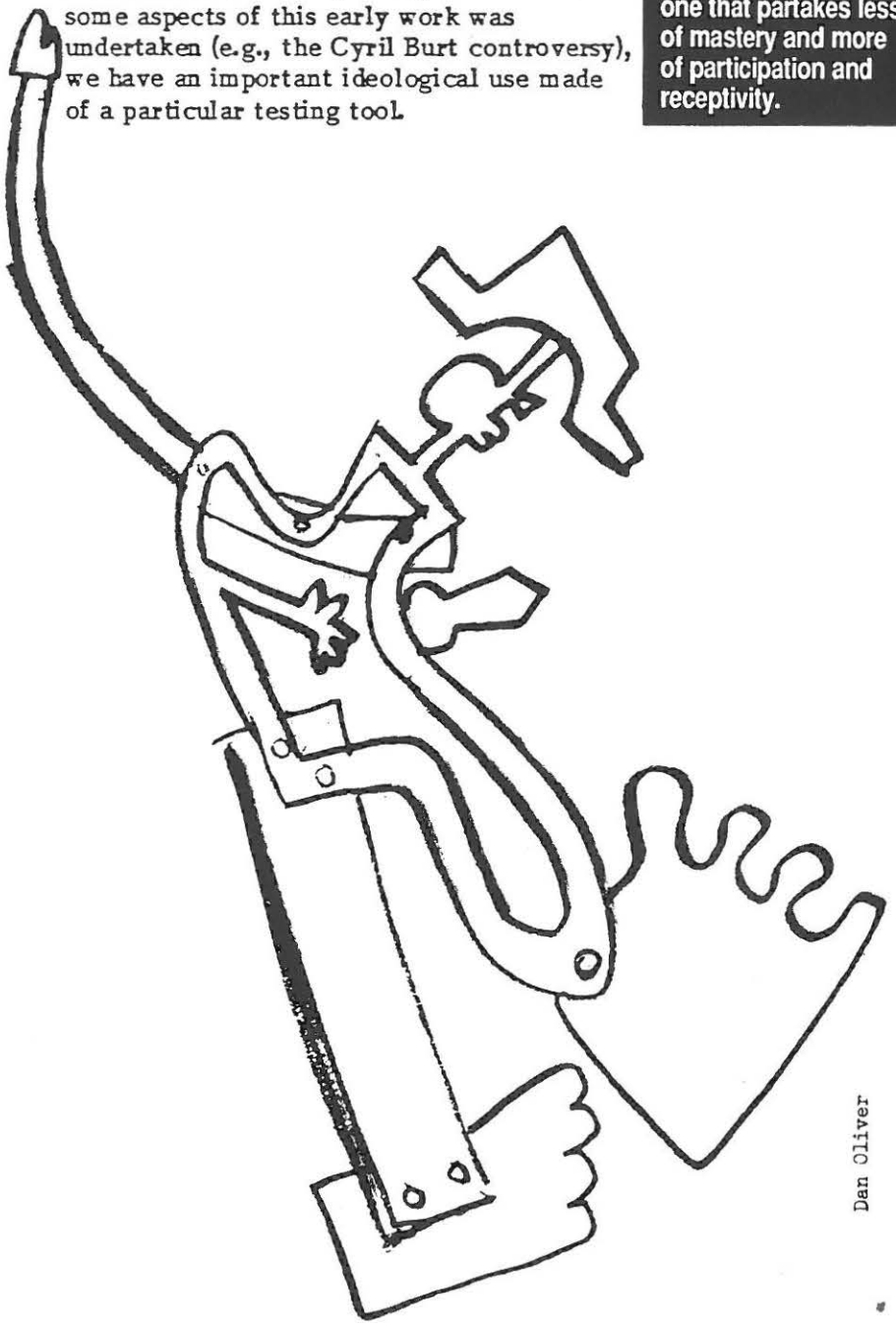
> these immigrants...do a great deal of work that no one else will do... It is...true that there is an immense amount of drudgery to be done...work for which we do not wish to pay enough to secure more intelligent workers. (Kamin 1982:98)

But, Goddard held little fear for the children of such persons, reasoning that their feeblemindedness was probably not a hereditary defect.

In 1923, Carl Brigham observed that those who had immigrated to the United States 20 years earlier were as bright as native born Americans, although this was not the case for those who had immigrated to the United States during the last five years. He argued that this difference had less to do with acculturation than with race: the former groups were from Nordic and English stock, while the latter were Mediterranean or Eastern European.

The implications of these analyses are as clear today as they were at the time they were developed; they also parallel contemporary efforts by Jensen and others (see Hirsch 1981 for a well documented, critical analysis of these current endeavors). Even if we leave aside the distortions in fact and in interpretation that run rampant throughout most of this work, and even if we leave aside the many serious questions raised concerning the honesty in data collection and reporting with which some aspects of this early work was undertaken (e.g., the Cyril Burt controversy), we have an important ideological use made of a particular testing tool.

What is called for, therefore, is a different relationship between humanity and nature, one that partakes less of mastery and more of participation and receptivity.

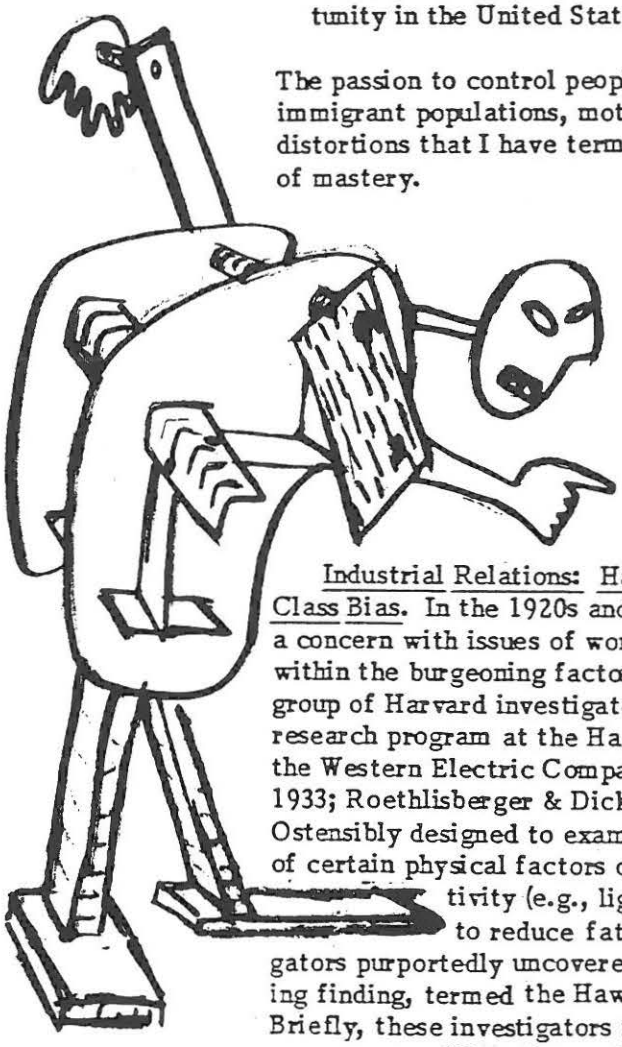


Dan Oliver

The I.Q. test was not invented simply to understand people but to arrange, classify and apportion them in ways to justify, legitimate and often conceal the technological demands of the developing machine-society. As two critics, Bowles and Gintis (1973) comment:

> I.Q. is not an important cause of economic success; nor is the inheritance of I.Q. the reason why rich kids grow up to be rich and poor kids tend to stay poor. The intense debate on the heritability of I.Q. is thus largely irrelevant to an understanding of poverty, wealth, and inequality of opportunity in the United States (p. 2)

The passion to control people, in this case immigrant populations, motivates the distortions that I have termed the inversion of mastery.



Industrial Relations: Hawthorne and Class Bias. In the 1920s and 1930s, driven by a concern with issues of worker productivity within the burgeoning factory system, a group of Harvard investigators entered into a research program at the Hawthorne plant of the Western Electric Company (e.g., Mayo 1933; Roethlisberger & Dickson 1939). Ostensibly designed to examine the effects of certain physical factors on worker productivity (e.g., lighting, rest breaks to reduce fatigue), the investigators purportedly uncovered the then surprising finding, termed the Hawthorne Effect. Briefly, these investigators found that whatever management did to the workers, raising lighting or lowering it, increasing rest periods or decreasing them, the workers' productivity appeared to increase. This effect was subsequently attributed to the attention that management showed the workers. Even today, numerous texts carry this as the basic message of the Hawthorne studies: workers are motivated by being shown attention from management. Indeed, one is led to believe that attention overrides such mundane factors as pay and working conditions!

While numerous criticisms of the Hawthorne program emerged over the years, Bramel and Friend (1981) have recently set the record straight by uncovering the self-deceptions of the original investigators. Let me cite only a couple of the many examples they present.

When it became apparent during the study that several workers were not taking as kindly to managerial interventions as others, a decision was made to terminate two unruly workers and to replace them with two more cooperative workers; that is, two who would produce regardless of the work conditions presented to them. To find an increase in productivity after replacing two recalcitrant workers with two cooperative workers, and then to attribute this increase to benevolent management, seems not only to miss the point but to manufacture the point that the researchers and the management were hoping to find in the first place.

Bramel and Friend report another related instance involving the interpretation that the Hawthorne investigators made of the resistance they encountered from one particular worker. In writing to their benefactors at the granting agency, the Rockefeller Memorial, these investigators observed that a woman had been dropped from the study because she had "gone Bolshevik." As though that were not sufficient, the investigators added that it was later discovered that she had been sick with animia at the time of her reported noncooperation, and that "After treatment for the anemic condition...in subsequent discussions she disavowed her former criticism of the company" (Bramel & Friend 1981:871).

In other words, according to the Hawthorne investigators, workers who refused to cooperate could not do so for rational reasons, but only for irrational political motivations or because of ravages of illness that had robbed them of all reason. In this particular instance, the scientific investigators had simply assumed that worker-management conflict must be nonrational since both groups must surely share the same interests.

Summary

I selected three different though related cases in order to illustrate both deviance within science and the deviance of science. In each case, the patriarchical pursuit of mastery pressed the investigators to distort their findings without significant awareness of that distortion. This resulted in subsequent generations of scientific investigators accepting many of these findings without question. After all, the facts seem to speak for themselves; and furthermore, the facts are congruent with the patriarchical worldview from which they were generated and in whose name they have functioned.

In noting this generational transmission of scientistic ideology, I am agreeing with the key point recently made by Samelson (1980). He questioned the classical research study reported by J. B. Watson that founded behaviorism in psychology, as well as Cyril Burt's by now infamous twin studies. More significantly, however, Samelson has challenged those who have accepted these findings without critical doubt: "it took more than two isolated individuals to give their data, for considerable time, an evidentiary status they did not deserve" (Samelson 1980:623).

The deviance of which I speak, therefore, resides not in the individual or even the group of individuals who conduct scientific work in the first place. Rather, the deviance within and of science resides in the entire cultural system that employs a single, Baconian framework which necessitates these kinds of distortions. The solution to the problems raised is not more of the same, but the development of significant alternatives to the patriarchical-dominant worldview that has thus far dominated our Western understanding and practice.

So that my point is not misunderstood, I am not using these examples to describe mere errors in judgment or slippages of reason. In my view, they represent the fundamental inversion of mastery, the ideological distortions that are generated when instrumental and technical reason become the absolute judge and jury of all human knowledge, and produce what Habermas (1971) terms scientism:

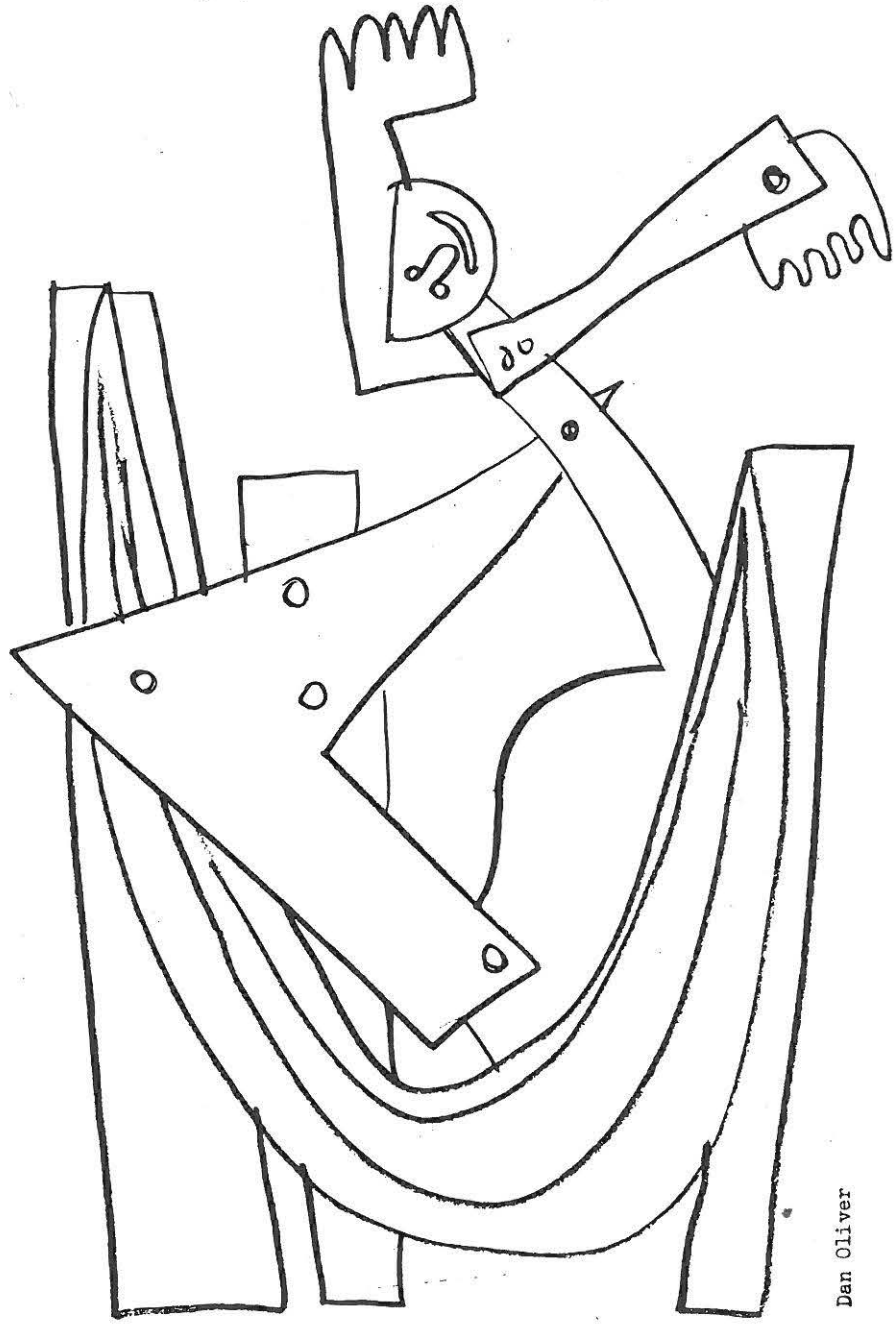
> the conviction that we can no longer understand science as one form of possible knowledge, but rather must identify knowledge with science. (p. 3)

That knowledge form represents the patriarchical attitude, the sovereignty of man over nature and all that symbolizes nature.

Conclusion: Towards and Alternative

I have suggested that in the single-minded pursuit of mastery, the pursuer becomes the pursued, trapped by the very lures and snares established to catch and dominate the presumed "enemy." The very

A new metaphor, strengthened and re-affirmed by structures that sustain and nourish it, surely is necessary lest we literally employ one view of progress to end all progress.

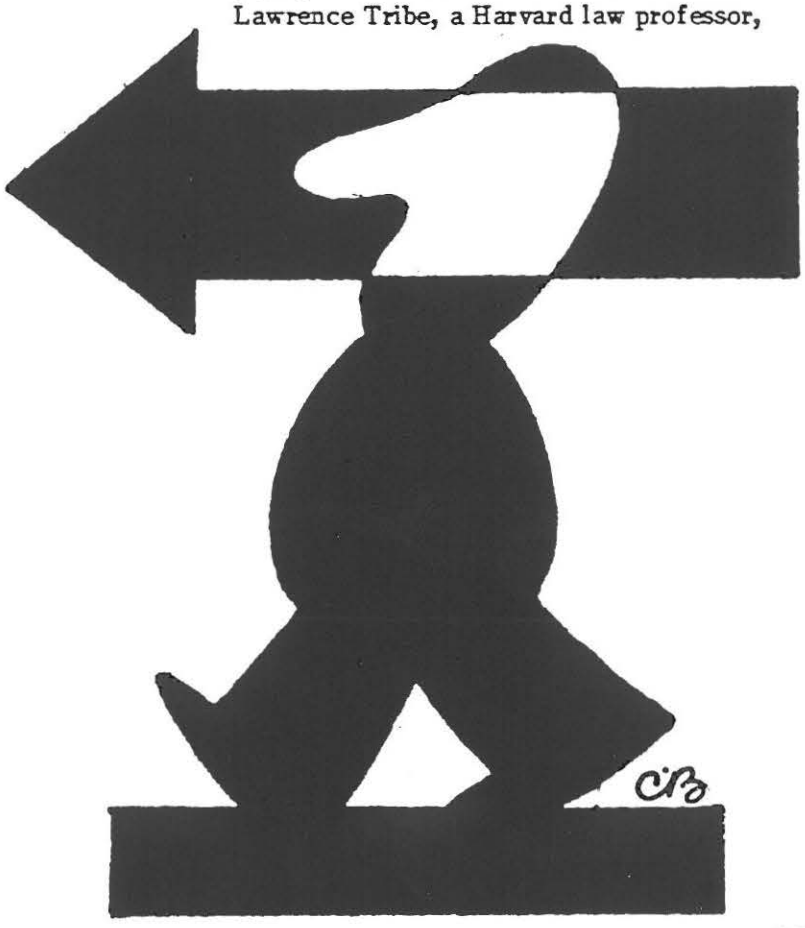


Dan Oliver

tools and institutions established in the first place to achieve mastery become the source of the new problems that humanity confronts (see Ogilvy 1979 on a similar point). What is called for, therefore, is a different relationship between humanity and nature, one that partakes less of mastery and more of participation and receptivity. To paraphrase Gregory Bateson (1972), those who seek to control their environment by exercising their sovereignty over it, as though they and it were not part of the same system, find themselves destroying the very other that they need for their own survival.

The gentler attitude suggested by Gruber describes an approach that emphasizes more receptivity, connectedness and participation than conquest. Unfortunately, the very social institutions that feed upon mastery, and here I refer to the underlying socio-economic structures, especially advanced capitalism, that have come to dominate the Western worldview and human consciousness, seem to demand the poison that passes for the remedy.

Let me focus this point by calling upon a fascinating discussion which I first encountered in a paper by William Leiss (1975) in which he cites the ideas of Lawrence Tribe, a Harvard law professor,



and the works of Peter Singer and Christopher Stone. Tribe speaks of constitutive rationality to describe an alternative to the means-ends rationality of instrumental reason. He argues that technological decisions are not merely to be understood in terms of some payoff matrix with seemingly factual entries being made and some equation solved. Each technological choice transforms the experiences and the consciousness of the individual and the community. Thus, more than mere instrumentality must enter into the very knowledge-constituting processes.

In other words, given the profound impact of instrumental acts on human life and well-being, bases of knowledge beyond the instrumental must enter as vital components of what is held in high esteem within a culture. This alternative of constitutive rationality can be used then to supplement the existing dominance of instrumental rationality. Tribe seems to be describing an attitude beyond mastery, a more receptive relationship between humanity and nature than the patriarchical view that has thus far so heavily dominated and threatened our civilization: both by tearing it apart from within (as the three examples previously cited suggest), and by threatening it with environmental destruction (e.g., Schell 1982).

Both Singer, on behalf of animals, and Stone, on behalf of all natural entities, suggest the need to grant legal standing to nature so that its interests can be given due recognition in all matters at hand. Stone urges us to grant forests and streams legal standing as entities with separate and important rights and interests of their own, lest in the name of human mastery, we view the only interests to be those of human sovereignty. We have recently seen several legal cases of this sort in which the rights of an endangered species to survive is represented in opposition to the rights of industry to build a new hydroelectric plant.

Several other cases also highlight this theme. In Canada, for example, this is revealed in the plight of Native groups to preserve their land rights (i.e., its sanctity) versus the rights of technological interests to transport gas from Prudhoe Bay across northern Alaska and the Yukon into the Mackenzie Delta and down into the United States (see Winter 1981). Although the

I am not simply referring here to the nuclear arms race, but to all forms of destructive domination and exploitation which in the name of governance must defeat a kinship with nature. This involves the relationships between men and women, between whites and nonwhites as well as between those who presently possess economic dominance and those who remain part of the world's underclass.

Dan Oliver

Canadian government and several gas and oil interests in both the United States and Canada favored the pipeline, a commission was appointed with Justice Thomas R. Berger in charge to examine the social and environmental impact of the pipeline. Arguing that their case went beyond mere ideology as it was founded on clear-cut facts, the industrial side and its scientific advisors sought to further its interests in extending human mastery and sovereignty. The other side countered by attempting to reveal the gap that separated the presumed "logics" that are involved. Speaking on behalf of the Native groups, one representative observed:

> Somehow in your carpeted boardrooms, in your paneled office, you are plotting to take away from me the very centre of my existence.... Deep in the glass and concrete of your world you are stealing my soul, my spirit. By scheming to torture my land, you are torturing me. By plotting to invade my land, you are invading me. If you ever dig a trench through my land, you are cutting through me. (Winter 1981:101)

A very similar sentiment was also recently expressed, by the Hopi elders who saw their land likewise threatened by the onslaught of what passes for progress and the logic that governs its understanding (see Harris 1980).

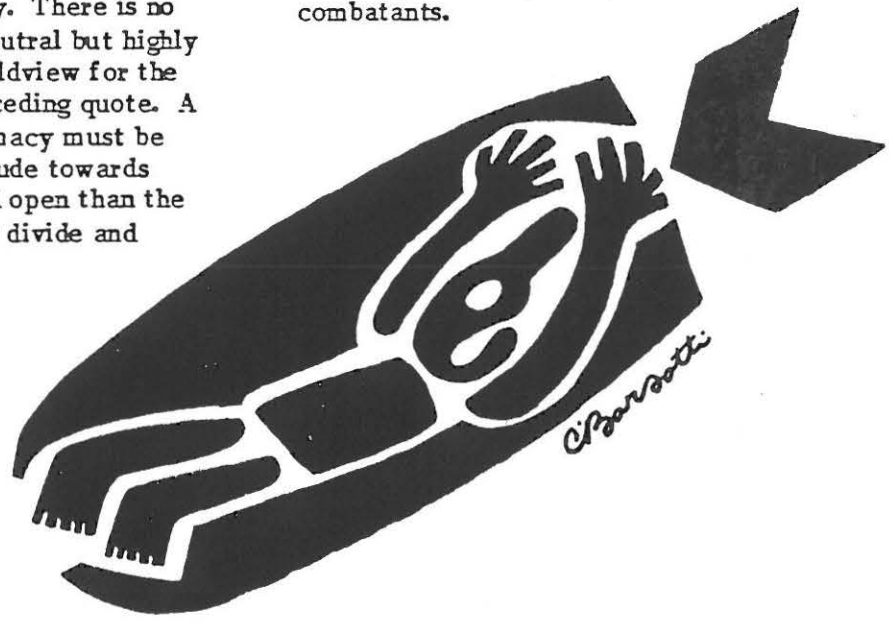
Surely, the reconciliation of these competing paradigms, logics or modes of reasoning, cannot be accomplished by employing the terms and understanding of the mastery-oriented model to evaluate the challengers to its ascendency. There is no room within its ostensibly neutral but highly interested technological worldview for the imagery captured in the preceding quote. A greater balancing and legitimacy must be granted to those whose attitude towards nature is more receptive and open than the worldview that would simply divide and conquer.

A New Metaphor

There have been several calls recently for a changed metaphor to guide human life in the years ahead (e.g., Lakoff & Johnson 1980; Marcuse 1977; Merchant 1980; Ogilvy 1979; Sarbin 1977; Wilden 1980; Winter 1981). Some have countered the metaphor of mechanism, patriarchy and instrumental logic with a call to return to a more organic metaphor that grants domination to the spiritual world. Others have called for a third alternative, the artistic or aesthetic metaphor that recognizes the both and that comprises the ecosystems—humanity and nature—in which people are a part, but not the whole.

A new metaphor, strengthened and reaffirmed by structures that sustain and nourish it, surely is necessary lest we literally employ one view of progress to end all progress. I am not simply referring here to the nuclear arms race, but to all forms of destructive domination and exploitation which in the name of governance must defeat the governed and all those deemed to possess a kinship with nature. This involves the relationships between men and women, between whites and nonwhites as well as between those who presently possess economic dominance and those who remain part of the world's underclass.

Thus, the inversion of mastery describes a kind of deviance that extends well beyond questions of honesty in gathering, analyzing and reporting one's research findings. It pertains to the very manner by which those who seek understanding must do so from within the cultural and natural webs that join us all together as participants, not combatants.



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ALL WATCHED OVER BY MACHINES OF LOVING GRACE

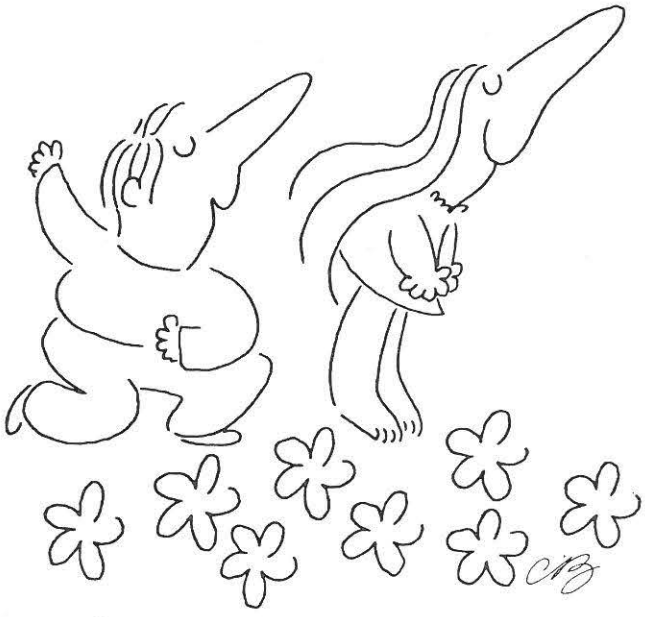
I like to think (and
the sooner the better!)
of a cybernetic meadow
where mammals and computers
live together in mutually
programming harmony
like pure water
touching clear sky.

I like to think
(right now, please!)
of a cybernetic forest
filled with pines and electronics
where deer stroll peacefully
past computers
as if they were flowers
with spinning blossoms.

I like to think
(it has to be!)
of a cybernetic ecology
where we are free of our labors
and joined back to nature,
returned to our mammal
brothers and sisters,
and all watched over
by machines of loving grace.

Richard Brautigan

"All Watched Over By Machines of Loving Grace," by Richard Brautigan is from the volume of the same name; reprinted by permission.

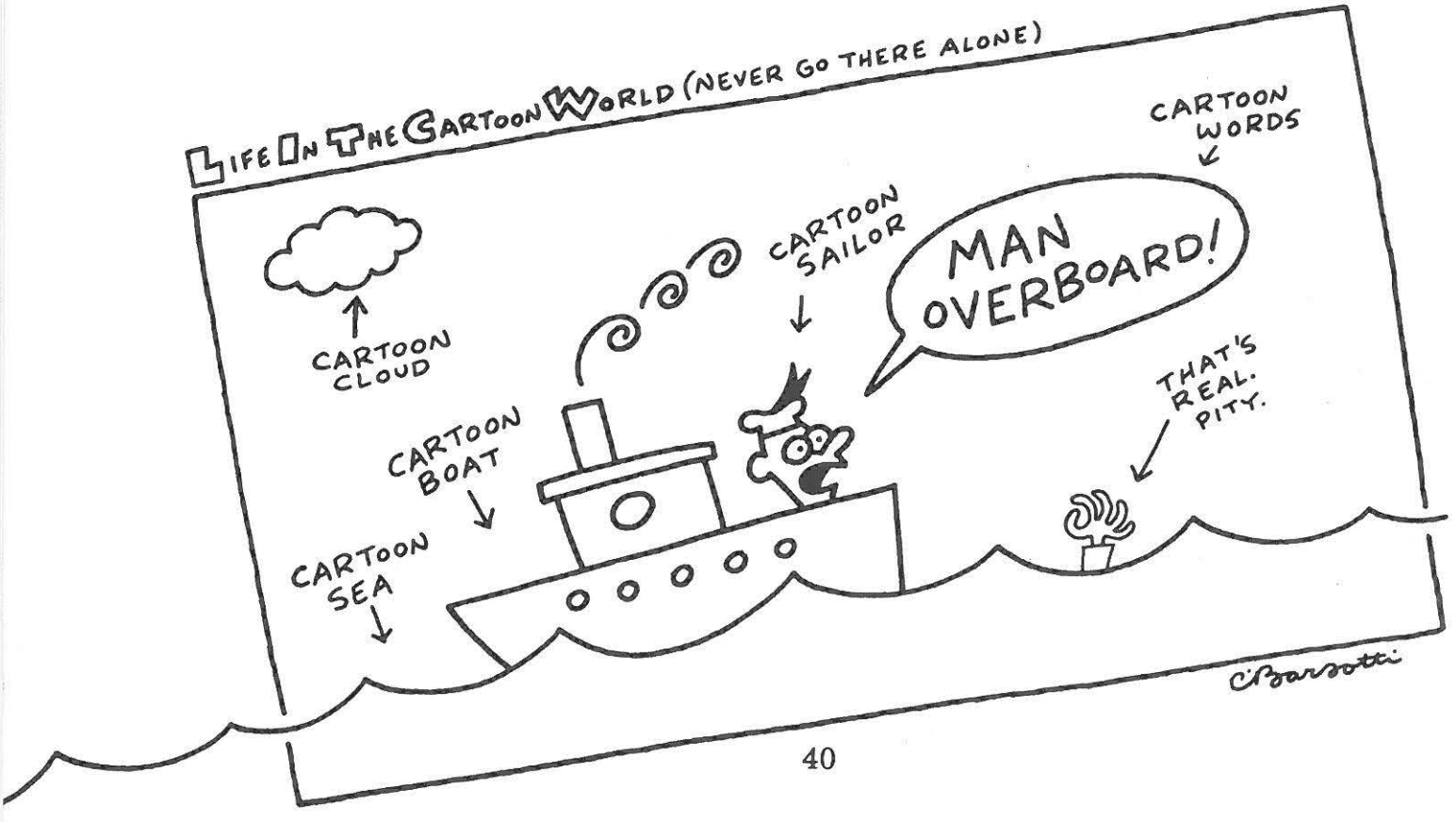


"Ah, were this poor systems analyst specialist but a poet."

To: Paul Trachtman
From: Scott Kim
Date: August 27, 1986
About: A "found" article plus commentary

I wrote this list of questions as I was just starting my PhD project Viewpoint. Viewpoint started life as an attempt at a "visual programming language", a programming language in which the form of programs would be more like pictures and less like text, with the hope that pictorial programs would be easier to understand than textual ones. But before I could invent a *visual* programming language, I needed a precise definition of "programming language". Unfortunately, I found no definition general enough to encompass the types of languages I envisioned. I'm still puzzled by the lack of research in these directions.

My conclusion, three years later, is that the term "programming language" is a red herring. A programming language is only one of many possible ways to get a computer to do what we want. Only when faced with actions that cannot be performed directly must we construct language-like descriptions of actions. Most of the time we can act more directly. Programming is a means of last resort. Therefore I no longer seek to make programming more palatable, but to eliminate the need for programming in the first place.



PROGRAMMING LANGUAGE QUESTIONNAIRE

November, 1983

Scott Kim
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Now 415/328-5160
Information Appliance, 1014 Hamilton Court, Menlo Park, CA 94025

INTRODUCTION

* What is a programming language?

  So far, I have found descriptions of particular languages, analysis of particular abstract issues (e.g. abstract data structures), and mathematical theories (e.g. McCarthy and Lisp).

  This all seems incomplete and short-sighted to me. I have seen almost no discussion that proceeds from general principles, other than from formal logic. When general principles are stated (e.g. structured programming is good), they are presented in a vacuum, without theoretical base, without comparison with alternate theories, and even without clear definition.

  I'm sure my criticism is too strong. Undoubtably there are many people chipping away at these issues. This questionnaire is a way for me to find out what other people are thinking.

CONTEXT

* Who thinks about programming languages?
* What do they study?
* From what backgrounds to they come?
* Why are they interested?
* How do these questions apply to you?

DEFINITION

* What is a programming language?
* What might be a better term for "programming language"?
* What metaphors do you like to use for explaining computers, programming, and particular programming languages?
* What are the landmarks in the history of programming languages? For each landmark, list a published reference.

JARGON

* List 10 significant words used in discussing programming languages.
* Define them.

MINIMAL ELEMENTS

* Sketch a minimal programming language--one that has been reducd to its essential elements.
* If you remove each of the elements in turn, what do you get?

CHARICATURE

* Draw cartoons that capture the personalities of your favorite programming languages. Feel free to use any visual metaphor that you find appropriate.
* What contrasts are brought out by your charicatures?

DIMENSIONS

* List dimensions along which programming languages can vary. For instance: interpreted/compiled, general/special-purpose, functional/object-oriented.
* Which of the logical possibilities in this space of languages have received the most attention?

CLASSIFICATION

* Develop a taxonomy (system of classification) of programming languages.
* Use this taxonomy to classify current programming languages.

COMPARISON

* List some of the reasons why you might want to compare two programming languages.
* How can you make your comparisons precise?

DESIGN ISSUES

* What are the issues that a designer must consider in designing a new programing language?
* How have languages actually been designed?

FRONTIERS

* What are some of the new directions that need to be explored?
* Why haven't they been explored already?

NONE OF THE ABOVE

* If you were designing a questionnaire on programing languages, what new questions would you add?
* What would you hope to learn?

SCIENCE AND LANGUAGE

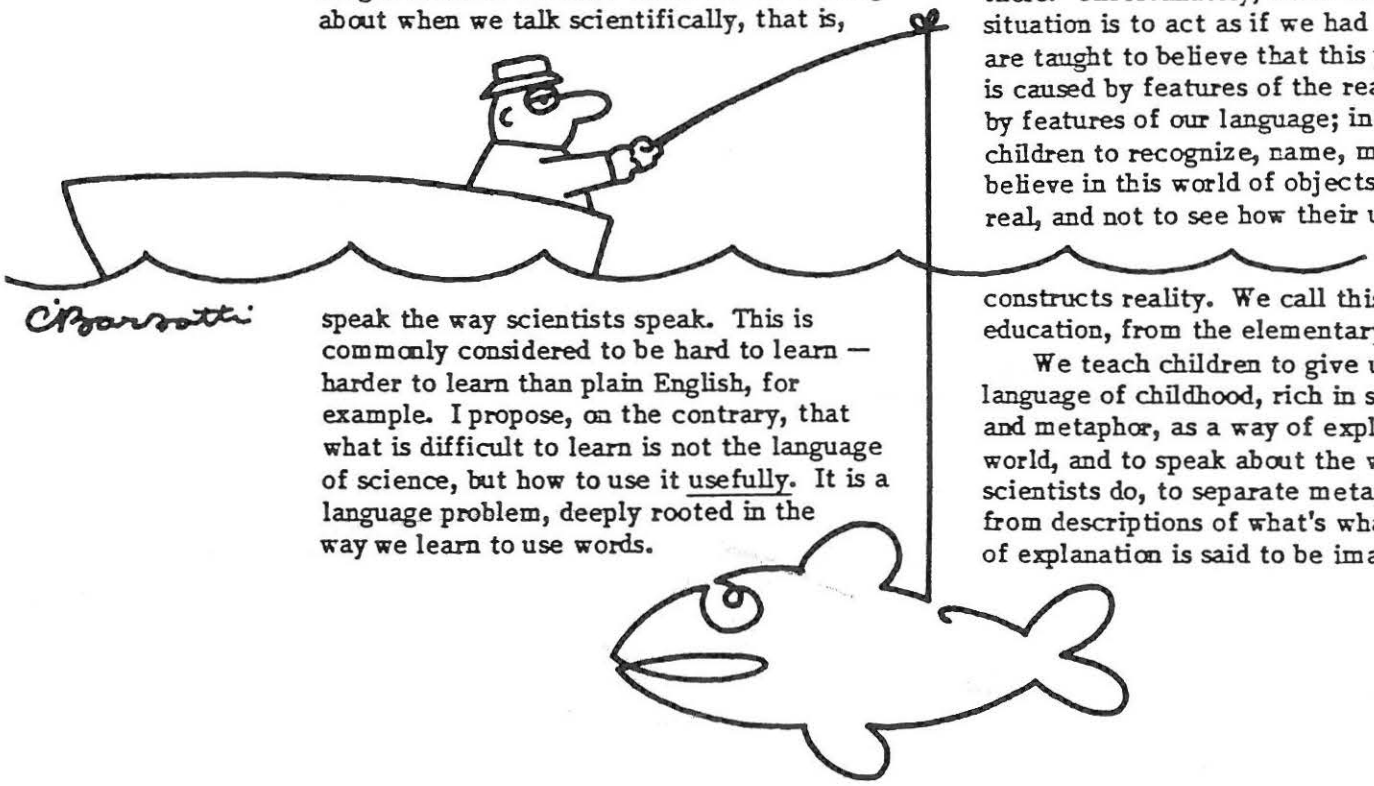
by Paul Trachtman
Smithsonian Magazine

Wittgenstein, suggested that the meaning of words is to be found in their use, not in corresponding objects: "The mistake we are liable to make could be expressed thus: We are looking for the use of a sign, but we look for it as if it were an object coexisting with the sign."

Ann Lewin has asked us to advise her in developing a National Science Foundation Learning Lab at the Capitol Children's Museum. When I accepted her invitation to join this Advisory Committee, it was with the understanding that Ann Lewin's committees are not like most committees. Usually, when I hear the word committee I think of a group of people arranged to act as a kind of flypaper, to which new ideas can become stuck after buzzing around for a while. On the other hand, I have learned that Ann's committees are usually designed to commit the acts they talk about. While the usual committee of experts might follow the injunction, "Know whereof you speak," we may find we have been invited to "Act whereof you speak."

If we accept the invitation, then our problem is clear. In order to talk about changing the way science is taught to elementary school children, we must consider changing the way we talk about science among ourselves. In other words, we may have to teach ourselves a new way of understanding what kind of thing science is — at the most elementary level. If we try it, we will see what beginners we are.

First of all, we will quickly find out that our basic problem is that we have been taught to think we know what we are talking about when we talk scientifically, that is, speak the way scientists speak. This is commonly considered to be hard to learn — harder to learn than plain English, for example. I propose, on the contrary, that what is difficult to learn is not the language of science, but how to use it usefully. It is a language problem, deeply rooted in the way we learn to use words.



We speak about science as if it is an object, and indeed I have made it the object of the verb, to speak, in this sentence. The point is more than grammatical. Schools teach science, and people tend to think of it, as the kind of mental object which we can describe with a metaphor as a body of knowledge. But if we talk about science as a body of knowledge we get into trouble, because few scientists would agree on what knowledge is. A computer scientist concerned with artificial intelligence, a cognitive scientist studying the rotation of mental images, a neuroscientist focusing on the events at the synapse between neurons, would be able to offer very different ideas about the nature of knowledge. The reason this seems odd is that we speak about knowledge as if it is an object, which of course it is in this sentence.

Similar problems arise if we try to establish the meaning of words like "mind," or "memory," or "information" — or any other words that we connect with a family of activities that require thinking. The way out of this dilemma was pointed out by Ludwig Wittgenstein, who suggested that the meaning of such words is to be found in their use, not in corresponding objects. He wrote, "The mistake we are liable to make could be expressed thus: We are looking for the use of a sign, but we look for it as if it were an object coexisting with the sign."

One consequence of this mistake is that we are looking for something that is not there. Unfortunately, what we do in this situation is to act as if we had found it. We are taught to believe that this performance is caused by features of the real world, not by features of our language; in turn we teach children to recognize, name, measure, and believe in this world of objects as if it were real, and not to see how their use of language constructs reality. We call this science education, from the elementary level up.

We teach children to give up the natural language of childhood, rich in story telling and metaphor, as a way of explaining the world, and to speak about the world as scientists do, to separate metaphor and story from descriptions of what's what. One form of explanation is said to be imaginative, the

other scientific. What is missed is that a speaker of scientific language makes up the objects being talked about as much as does a story teller or poet. The different languages are different forms of making things up, of fiction. Teaching children this would be a good starting point for developing a new science education.

Let me take an example from a metalogue (a made up dialog) between Gregory Bateson and his daughter, on the question, "What is an instinct?"

Daughter: Daddy, what is an instinct?

Father: An instinct, my dear, is an explanatory principle.

Daughter: But what does it explain?

Father: Anything - almost anything at all. Anything you want it to explain.

Daughter: Don't be silly, it doesn't explain gravity.

Father: No, but that's because nobody wants "instinct" to explain gravity. If they did, it would explain it. We could simply say that the moon has an instinct whose strength varies as the square of the distance...

Daughter: But that's nonsense, Daddy.

Father: Yes, surely. But it was you who mentioned "instinct," not I.

Daughter: All right - but then what does explain gravity?

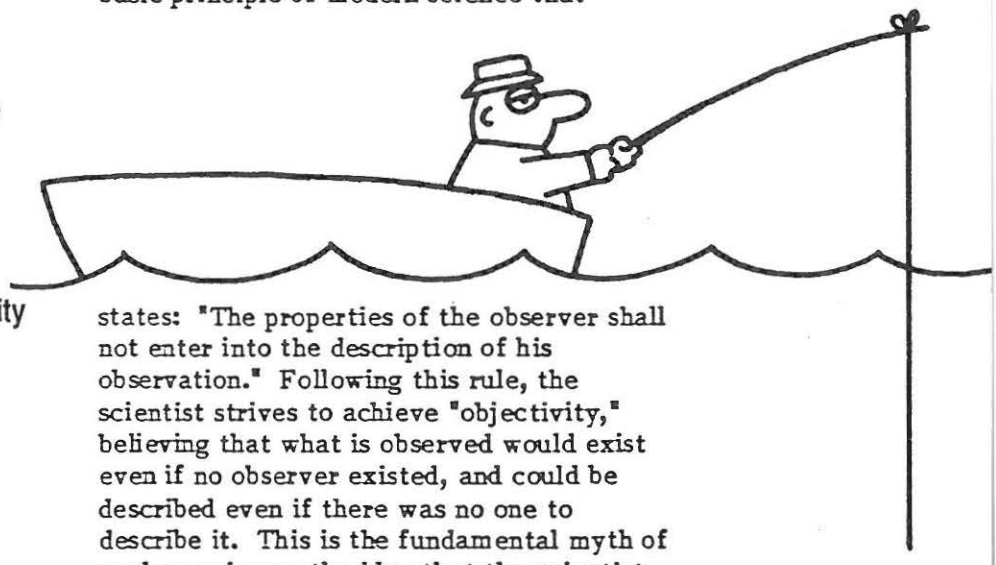
Father: Nothing, my dear, because gravity is an explanatory principle.

Bateson continues this conversational lesson to make the point that all scientific explanations are based upon "explanatory principles," which are invented in language, not discovered in nature. "An explanatory principle — like gravity or instinct — Bateson tells his daughter, "really explains nothing. It's a sort of conventional agreement between scientists to stop trying to explain things at a certain point."

If we accept this, then it is clear that scientific explanations, which may be seen as causal statements linking together descriptive statements, are always based on fundamental points of ignorance which are obscured by the scientific explanation. As a result, we do not really know what we mean by the words we use — we take them for granted until we stop to ask about them — for example, words like information, knowledge, intelligence, mind, or even meaning. In its definition of the word "meaning," the American Heritage dictionary quotes the logician Willard Quine, who says, "Pending a satisfactory explanation of the notion of meaning, linguists in the semantic field are in the situation of not knowing what they are talking about." We all live in Quine's boat, fishing for the satisfactory explanation of what we don't understand, and trying to explain why the fish doesn't bite. Bateson is telling us that there is no fish.

We all live in Quine's boat, fishing for the satisfactory explanation of what we don't understand, and trying to explain why the fish doesn't bite. Bateson is telling us that there is no fish. Wittgenstein is telling us to stop looking for the fish and start paying attention to the fishing.

Wittgenstein is telling us to stop looking for the fish and start paying attention to the fishing. To do this, we have to discard the basic principle of modern science that

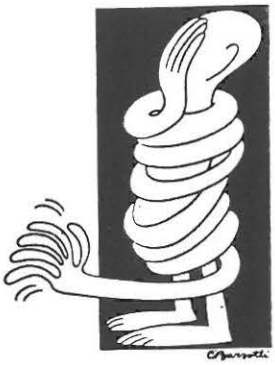


states: "The properties of the observer shall not enter into the description of his observation." Following this rule, the scientist strives to achieve "objectivity," believing that what is observed would exist even if no observer existed, and could be described even if there was no one to describe it. This is the fundamental myth of modern science, the idea that the scientist has no part in shaping the nature of the world he or she describes.

Unfortunately, this is a delusion. "Objectivity," observes Heinz Von Foerster, "is the delusion that it is not a delusion. It is the cognitive version of the physiological blindspot: we do not see that we do not see." One of the early participants in the development by cybernetics, Von Foerster wrote a prescription for advanced research into cognitive processes and societal problems (in a 1972 proposal to the National Science Foundation) that would serve well as a guide to learning science at the elementary level. In investigating cognitive processes and societal problems, a scientist is a participant in the processes and problems he or she is observing. In such circumstances, Von Foerster proposed, "All active attitudes available to scientific and creative man must move simultaneously and together, none emphasized at the expense of the other, each emphatically appropriate to a given observation or purpose."

In such circumstances, Von Foerster proposed, "All active attitudes available to scientific and creative man must move simultaneously and together, none emphasized at the expense of the other, each emphatically appropriate to a given observation or purpose."

If we accept this prescription, it becomes easier to see how science is changing, and how we could change the way science is taught and learned. The development of cybernetics in the 1950s was an indication of the kinds of change that are confronting scientists in almost all fields. The myth of objectivity, of a mindless world, and the reductionist form of explanation that supports it, culminated in harnessing steam power and splitting the atom, but it is now running out of steam and may be leading us toward our own Big Bang. The problem with reductionism, Gordon Pask points out, is that eventually it leads to a bad question: the bad question is the one where the more accurately you answer it, the less sense it makes.



Cybernetics represented a shift in the kinds of questions scientists could ask, focusing on "mental" phenomena in brains, computers, cells, ecosystems, and wherever else an observer might look. The first scientists to adopt this approach did not realize the consequences at first, but once they began to look at problems of purpose and mind in nature, they eventually had to turn their attention to look at their own looking. More recently, the development of new sciences concerned with computers and brains, of hydra-headed fields such as artificial intelligence, expert systems, information science and cognitive science, is a clear sign of change in what scientists pay attention to, and eventually enough bad questions will lead scientists in all these fields to see both nature and mind in new ways. It is happening now.

If we would like to talk about changing the way science is taught to children, it is essential to consider what kind of science children will be talking about. While I do not have the time here to elaborate, I would like to just mention two of the more revolutionary propositions that are becoming part of science, ideas which invite us not to take the word "science" for granted.

In evolutionary theory, there is mounting evidence that the Darwinian notion of change driven by competition may be replaced by models of change through cooperation and behavioral consensus, with new attention to the ways in which living organisms construct as well as adapt to their environments. We are taught to think of evolution as something that goes on independent of what we say about it. But if we look at evolution as explanation, as a story of how things change, we can now see it is changing into a different kind of story right before our eyes. From this we might learn that our understanding of evolution depends on the evolution of our understanding.

In biology, too, there are signs that old and long taken for granted distinctions among the nervous system, endocrine system and immune system are breaking down and will have to be discarded. Here again, because we think of these things as things, and don't look at the use of the words, it seems painful to contemplate giving up such "things." But many basic chemicals which heretofore were satisfactorily explained by their role in one or another of these systems, are now found to be playing different roles in two or three systems at once. Brain peptides, for example, understood only as playing a part in movement of nerve impulses across a synapse, are now seen as participating in reactions among antigens and antibodies, and also to be components of hormones.

Every teacher knows from experience that some degree of stress, excitement, or other "emotional" expression can increase a child's ability to learn and remember even the most abstract lessons. But the same teachers tend to take for granted a distinction, made after scientific testing, between an "emotionally disturbed" or "learning disabled" child who has difficulties in class.

As the nervous, endocrine and immune systems go the way of old categories, we will also have to give up explanations based on distinctions among physical, mental and emotional behavior. We will find that shape and behavior are simply two ways of describing something that produces both. We may begin to see why we make both physical and emotional reference with the verb, to move; and why our prescientific language of Indo-European origins resonated with phrases such as "It's on the tip of my tongue," "I know it in my bones," and "I can't prove it, but it feels right;" we "think on our feet" and if we are particularly quick witted, we're "on our toes."

A recent paper on the "Common Origin of Linguistic and Movement Abilities" by Bellman and Goldberg, published in the American Journal of Physiology (reprinted in Cybernetic #1), warns readers: "There are two assumptions that we will challenge here: the first is that communication is somehow a higher order function than movement skills, such as feeding; this assumes that one could have a behaving organism that secondarily evolves into a communicating one. The second assumption is that movement processing is concrete, primitive and a matter of stimulus-response linkages that do not require the sophisticated cognitive abilities associated with language."

While the research described in this paper concerns the nature and behavior of cells and 'lower' organisms such as lizards, the implications for understanding human language and behavior are profound. New scientific understandings such as these also carry implications for education, in science or any other field of interest. Among the implications, I suggest, is the understanding that even nerves, hormones and antibodies are metaphors, that movements, moods and minds are not explained by our explanations, and that science is a way of making up stories about how we get anywhere and know anything at all.

DINOSAUR BAG

An old cloth bag
full of plastic dinosaurs
spill them onto the floor
and engage in fantastic dramas

We can conquer the world!
we could
could we?

Thousands of grand schemes
dinosaurs more human than men dare to be.
Millions of ideas
dialogue
dinosaur bagging
the finest art form of my youth.

ROOSTER SHACK

We were garbed in respirators
we prepared our smoke guns,
put assorted gear into the green knapsack,
and headed, with great purpose
to the old rooster shed,
back behind the main coop complex
over by the dump pit where you shoot
bottles and cans

We entered and smoked the place out
sending wasps on the wing
and then scrubbed the place
free of dust and wax-comb
discussing great plans for future forts
after all, just a ways beyond
there stood a second rooster shack

MAJOR VEGETABLE

The flea was rearranging his furniture
the sugar crystal goes here
and the salt goes there
the stuffed mite will go to the left
of the hat rack
where no hats hang
someday the flea believes that will change
one day he will buy a hat
probably a beret
to look more liberal
to impress
to up his rank
from captain of the pepper shakers
to major of the vegetables...
major vegetable.

B. K Rushford

PAUL TRACHTMAN

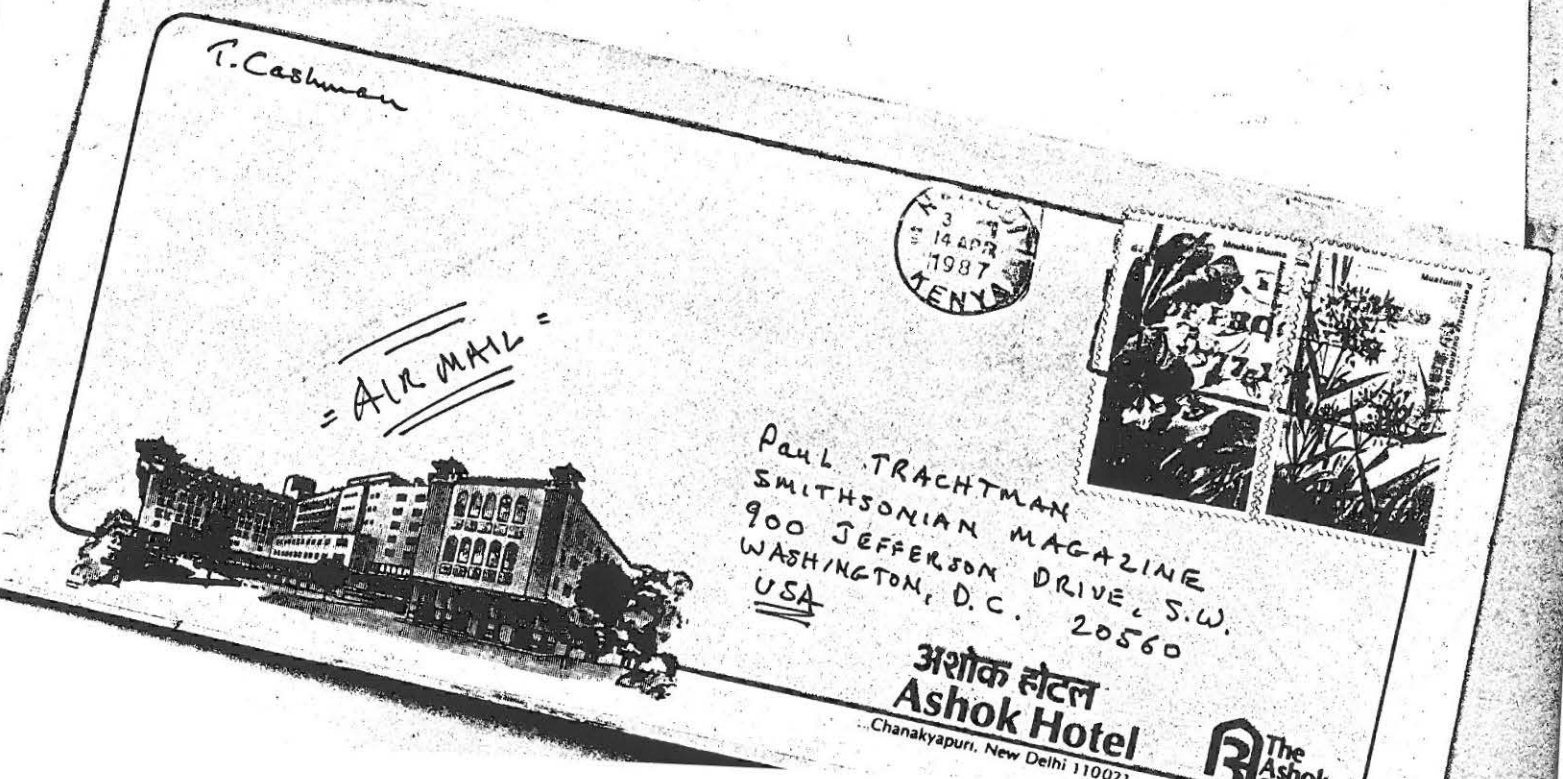
The Bateson Conference of 1984 grew from the deep conviction, both on my part and that of the nuns at the College of [redacted]. Benedict, that the world is dying of undigested expertise.

Saint

This culture's fierce anthropocentrism and narrow-purposed technologies do not fit within the requirements of an interdependent biosphere. As such, they are toxic to the whole system, and potentially lethal to most creatures.

For 15 years I had been looking for an evolutionary biologist who was also a practicing anthropologist and a psychological theorist. My hope was, that if a thinker, thus steeped in the rich empirical data of living systems, were to turn his mind to the great philosophic questions of the human spirit, it might be possible to develop a WISDOM tradition for the future of the planet. For 2500 years the key philosophical questions had been examined by brilliant minds with insufficiently rich bases of empirical data. The result has been systems of thought, many of which contain wisdom, but which have not withstood the onslought of specialized sciences.

Gregory's work grew from a profound commitment to the future of all creatures. The "eternal verities" he perceived embedded in the living natural world stand for us as the potential foundation for a sustainable civilization. He forged the bases of a philosophy of nature that combines rigor and imagination. His life stands as a sign to us all that it is possible to care and at the same time seek clarity.



DIALOG AT A BATESON CONFERENCE

Edited by Tyrone Cashman

MARY CATHERINE BATESON

Gregory once set out to define love. He defined love in terms of a way of looking at systems.[1] Using his concepts, and my words, it was this: To say that I love 'x' is to say that I can look at 'x' and see that 'x', like myself, is a system, with the same kinds of order and organization that are essential to my life. To wish 'x' the chance to maintain those processes rather than fall to pieces and die. And to visualize that 'x' and I could be coupled, combined in a larger interactive system that includes us both. To be able to visualize myself as part of a system of which 'x' is a part. So that I value this 'other,' which might be a human being. It might be a lover, might be a baby I care for, but then again it might be a forest, or another mammal, or a plant, or more complexly, a large number of plants or mammals. And I see a similarity, an abstract basic similarity to myself. I recognize myself and I can imagine being a part of a large system with this 'other.'

Now when you hear that, I think you can see that, although this is a very strange definition of love, it's one that opens out. This emphasis on recognition and on co-participation becomes a basis for a very wide range of affirmation. It cuts right across so much that human beings have done to contrast themselves, separate themselves, from the rest of the natural world. And, incidentally, by its emphasis on close mutual involvement and organization, cuts across many of the divisions we have made in ourselves — say, the separation between mind and body.

You can see, then, why an incapacity to recognize and respond to natural order loomed so frightening, and is so frightening. At the time of the conference described in Our Own Metaphor, Gregory proposed that there is something about the structure of human consciousness that makes it impossible for human beings to see the natural world as it is, i.e., to respond, to recognize, to acknowledge, to co-participate. The question of what we can see and how we can organize our interaction becomes a question of immense moment for human survival. And it looks at first as if the solution must lie in better information, better recognition, greater clarity.

Now, as I thought about what I would want to say here tonight, and looked back on some of the last things that Gregory had written before his death, one of the things that struck me was that that was not always what he was saying. It struck me that almost as often as he was emphasizing a 'better' version of the other, better information, better understanding, he was also emphasizing the fact that natural systems depend on certain kinds of disjunction, on the fact that not all the information is available. This is, in a sense, the thing I find myself wrestling with at the moment.

Natural systems depend on certain kinds of disjunction, on the fact that not all the information is available.

Love must involve a degree of privacy, a degree of mystery, a degree of separateness.

We are invited, at this conference, not to summarize what seems to be fully said, but to try and find the edges of some ideas that need work on them. And I have become very interested in the way in which various kinds of "unknowing" keep cropping up. It may be that the issue is simply one of tolerating and including the unknowing within the recognition.

We all do it with other human beings all the time. It's essential to a relationship with another person that we be aware of the fact that we do not know what is going on in that person's head. We do not understand all their thinking. We cannot think as one, although we can think together in a combined thinking system that includes us both. So, as far as interpersonal relationships go, I think everyone can see that we tolerate ignorance and that the lack of ignorance would be, finally, intolerable. There is something about love that isn't in that definition I offered you, but came forward for Gregory later: that love must involve a degree of privacy, a degree of mystery, a degree of separateness.

In the later years, Gregory was trying to define the sacred. On the one hand, he tended to define the sacred in terms of the recognition of systemic patterning, but on the other hand he tended to define it in terms of the fact that there are areas that you do not try to fully know. And especially that you do not try to manipulate.

I don't know what the implications of that will be, because of course we are going to go on trying to know more, trying to do better science. The effort to know isn't going to go away. Maybe it has to do with not simply seeing knowledge and lack of knowledge as contradictory, because, after all, the more you know, always, whether about another person or a natural system, the greater the mystery that lies there. And a way of meshing our science with our sense of the sacred might be to work out that relationship a little further. It's a question.[2]

If you compare the DNA or the RNA in a chloroplast, with that of the cell's nucleus and with that of a photosynthetic bacterium, it turns out that a chloroplast is more related to a photosynthetic bacterium than it is to its own nucleus.

FOOTNOTES

[1] Mary Catherine Bateson, OUR OWN METAPHOR. New York: Alfred A. Knopf, 1972, p. 280.

[2] This question is one that the speaker was working on at the time the St. Benedict's Bateson Symposium took place. She was in process of completing the manuscript, ANGELS FEAR, which her father had begun before he died. The book was recently published. ANGELS FEAR: TOWARDS AN EPISTEMOLOGY OF THE SACRED, Gregory Bateson and Mary Catherine Bateson, New York: Macmillan, 1987.

JOHN STOLZ

Now, if we expand it to the next step, and talk about eucaryotic cells or the cells that make us up — you know, like our skin cells and all that. If you look at them as "microbial communities," you can get the connection. And this is one of the things Lynn Margulis has been working on since the early 60's, the symbiotic theory of the origin of eucaryotic cells. Now that sounds like a lot to swallow, but what it means is that these different bacteria evolved with different metabolic pathways and that by combining themselves, they were able to make a quantum leap in evolution and make a whole new system. The theory says there was one particular cell — they call it the "proto-eucaryotic" cell — with its nucleus and its cytoplasm, which engulfed a bacterium that eventually became a mitochondrion, and that those organisms that become photosynthetic simply swallowed one of the photosynthetic bacteria.

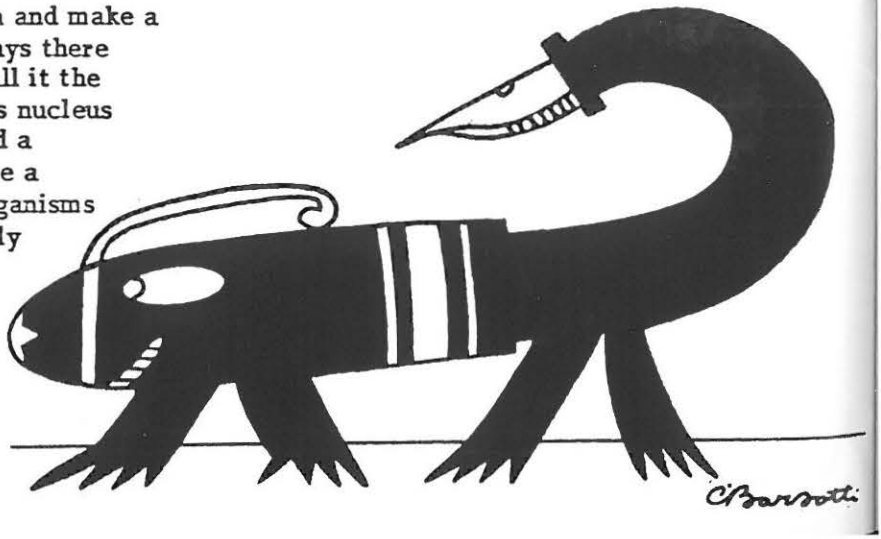
Over the past fifteen or so years the data have come out that substantiate this. If you compare the DNA or the RNA in a chloroplast, (the chloroplast is the photosynthesizing element of a plant cell) with that of the cell's nucleus and with that of a photosynthetic bacterium, it turns out that a chloroplast is more related to a photosynthetic bacterium than it is to its own nucleus. The same thing holds true for mitochondria; some very interesting things.

So, going up this hierarchy of things — you start out with the simple bacteria, then you make a eucaryotic cell, then eucaryotic cells decide — well, they get together, they don't "decide,"— they get together and they make things like little worms and metazoans and then eventually you get to the point where you have trees and animals and what we have on this present earth today: the different types of organisms.

* *

I would like to make, at this point, a statement. I just started reading Bateson; I'm not one of these people well-versed in Bateson. But in his book Mind and Nature: A Necessary Unity, when he defines "stability" he gives as an example, ecosystems. Today, with our new insight, both the planetary and the historical perspective, we know that ecosystems are anything but stable. They are constantly changing. They are constantly interacting with their environment. Their environment is influencing them and this cyclical process, more or less, tumbles us down our way on the evolutionary pathway and today these things exist and are maintained to a certain extent by the biosphere, but they are subject to change.

And whether or not we fit in is a question that can be addressed by other people, but that's the main point.



HUMBERTO MATURANA

Science is a particular way of explaining human experiences. It is human beings that exist —languaging, talking, they do this — it's us. But at the same time we can see that certain things happen Where does the phenomenon to be described arise from? From the domain of experiences of the observer—it is something given in his or her experience. From where does an explanatory hypothesis arise? From the domain of experiences of the observer. Einstein said, and many distinguished physicists have said this, that scientific theories are free creations of the human mind. The mystery is, how come the world becomes intelligible through them, if they are the free creations of the human mind? The answer is here. It's not the world that becomes intelligible, it is the doman of human experiences, whence these free creations come from.

When you have a recurrency of interaction in a domain of existence, you have a social system, if this recurrency of interactions lasts sufficiently long to constitute a unity that you distinguish.

In order to have recurrent interactions, somehow you must stick together. Without sticking together, without the stickiness that keeps you in recurrent interaction with the other, you do not have social phenomena. And this stickiness is biologically constituted in us, can be interfered with, can be enhanced, but is biologically constituted. We have stickiness for each other We may be educated to inhibit our stickiness for each other. We may be educated to inhibit our stickiness when the mother says you must not play with those children. Please, don't go with them." You're interfering with the stickiness within children. But when one says, "Well, I do not mix with these people because they belong to another social class," that means that you could stick with them, yet you interfere with this stickiness. What I'm saying is that this stickiness, that constitutes the foundation of social phenomena, is spontaneous, requires no justification and either takes place or does not take place. If it takes place, it is constitutive of unities which are social systems. If it does not take place, social systems do not arise. This stickiness is what I call "love."

MICHAEL OPITZ

Whether or not there be an "objective world," —we've had this talk for a couple of days now and it's quite fascinating— the distinction drawn by this kind of thought breaks patterns. It classifies subjects, it classifies according to subjects. The conclusion is of a lower logical type than the major premise. It splits the world into parts. It isolates individual existence: ex: out, stare: to stand. This, existence: to stand out from, to be isolated, to be alien, and I think ultimately this type of thinking reflects Bateson's Eden story. This is the story of separation. It is the story that divorces us from experience of unity.

Bateson says, "Art, religion, dreams serve as a correction to our conscious purpose, which is always needing correction."

* *

(He quotes from W.B. Yeats, Among School Children)

> Labour is blossoming or dancing
> where
> The body is not bruised to
> pleasure soul,
> Nor blear-eyed wisdom out of
> midnight oil.
> O chestnut-tree, great-rooted
> blossomer,
> Are you the leaf, the blossom or
> the bole?
> O body swayed to music, O
> brightening glance,
> How can we know the dancer
> from the dance?

And let me say, that's what a meta's for. It is a way to keep you from separating dance and dancer. You're not supposed to know the dancer from the dance. It's a foolish distinction. Using Humberto's lovely phrase of yesterday, A metaphor brings forth "a domain of coherences," a pattern of relationships which connect.

FR. MATTHEW FOX

A second theme that I think is very important to Bateson, and to all of us, is the theme of a non-dualistic way of envisioning relationship to divinity. The proper name for this, in the tradition of creation spirituality, is panentheism. Panentheism is different from pantheism. It will save your neck if they are about to burn you at the stake. You just insert that little Greek preposition "en." Pantheism is two Greek words that say: everything is God, God is everything. This tends to box God in. Panentheism says everything is in God and God is in everything. That's perfectly orthodox and as I say, it may save your neck some day to know that, but what's all important is this: we have to let go of our awesome, awful, dualistic religious images of theism. The notion that God is out there some place and we're here. That is, it's beyond belief that the West is still stuck on "theism." Carl Jung says there are two ways to lose your soul and one is to worship a god outside of you. Panentheism, I believe, is the appropriate and maturely adult, mystical way of envisioning our relationship to divinity. It is like being a fish in water. Is water in the fish or is fish in the water. Are we in the cosmos or is the comsos in us? Is Divinity in us or are we in Divinity?

And Eckhart says,"Until we learn to live without a why, and to love without a why, and to work without a why, we have not learned how to live, how to love, how to work, or why."

* *

A third parallel between Bateson, Eckhart and Hildegard is that Bateson talks about, and I'm quoting, "changing boundaries" of mind.

Last night Mary Catherine Bateson talked about needing to image the self as part of a deeper, larger system. This is exactly what Hildegarde is inviting us to do — to start reimaging in bigger terms than we have been doing. How do we do that? Well, Hildegarde gives us a way and so does Eckhart when they both say the soul is not in the body, but the body is in the soul. Because, if my soul is in my body then my soul, that is my vital part, is only six feet by seven feet on a good day. You see? But if my body is in my soul, then there is this opening up, this changing of boundaries that Gregory Bateson calls for.

And spiritual growth goes on and on, not just personally, but communarily and collectively. As this morning's speaker (Humberto Maturana) told us — as a society, as a social group, love increases. Eckhart says, "God rejoices every time the soul expands." So there's a sense that we're constantly expanding and, of course, we are. The fact that our generation sent a machine out of this solar system, purposely, means we're out there. We're getting the pictures. We're getting information and our taxes pay the bill, so we're out there.

Bateson says, "Art, religion, dreams serve as a correction to our conscious purpose, which is always needing correction." And Eckhart says "Until we learn to live without a why, and to love without a why, and to work without a why, we have not learned how to live, how to love, how to work, or why."

LYNN HOFFMAN

To illustrate the idea that autopoietic systems are information-tight, Maturana uses the analogy of the pilot who makes a blind landing in the fog. There is no exchange of information between the pilot and the world outside. He has no picture of it, nothing. All he has done is to line up one set of readings on this instrument panel with another. Maturana would say, I think, that living organisms are always making blind landings even though we think we exchange information with the outside world all the time. Then how does he describe how we, as informationally closed Helen Kellers, ever manage to communicate at all? Interestingly. He speaks of structural coupling, a process that seems to me to resemble a blindfold jump rope game. It is as if, informationally speaking, we never touch. All we can do is generate trajectories, invisible to us, that are mutually constraining and whose connections show up on our instrument panel. A baby and a mother shape each other in such a way that one day the mother puts the baby on the pot and says, proudly, "I toilet-trained my baby." The baby says, perhaps also proudly,

"I toilet-trained my mother." The pair are, in this example, structurally coupled. One system has got together with another in what Maturana calls "consensual validation of consensual validation." Thus, all communication is necessarily indirect, at least between us as we know us.

In Close Encounters of the Third Kind you have a good example of this. The earth people and the space people are trying to solve the problem of communicating when neither group knows whether the others are intelligent beings or how to arrive at a common language for determining that. The space people, who presumably have a highly developed sense of harmonics, emit a series of musical notes and wait The earth people emit the same series back. The spaceship explodes in a burst of jubilant noises and the earth people jump up and down. Communication has not been established, but communication about communication has.

Another corollary of this position is that you can have no "instructive interaction," as Maturana calls it, in the sense of placing little pictures or little packets of information into the heads of other people, or receiving such packets in return. You cannot buy a round trip ticket to the outside world the way you can go to a foreign country, buy something and bring it back. You can only buy a ticket to a loop inside your head. This is why Maturana, when he lectures about his theories, always puts an eye in profile in the upper corner of the blackboard. He is reminding us that "objectivity", which is always in quotes for him, is literally in the eye of the beholder.

From this vantage point then, the treatment unit looks vastly different from before. The old idea of treating a psychiatric symptom was based on the medical notion of curing a part of the body. The illness was in some spatially-defined, out-there, unit We can no longer say that it is in the family, nor is it in the individual. It is in the heads or nervous systems of everyone who has a part in specifying it.

The old epistemology implies that the system, psyche, family structure, the gene—what have you, contains or creates the problem. The new epistemology implies that the problem creates the system. Repeat that, underline that. The problem creates the system. The problem is whatever the original distress consisted of, plus whatever the distress, on its merry way through the world, has managed to stick to itself. The problem is the meaning system created by the distress, and the treatment unit is everyone who is contributing to that meaning system. This includes the treating professional as soon as the client walks in the door.

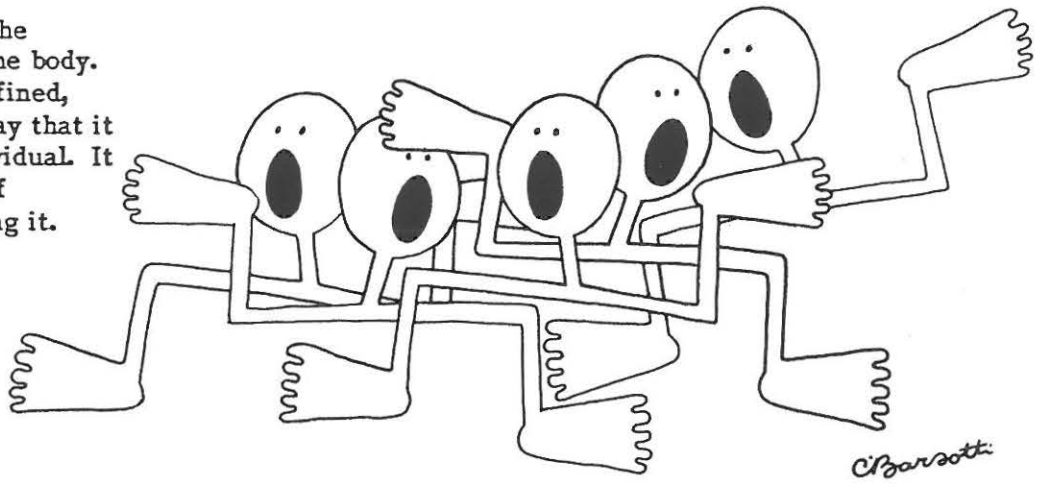
* *

The treatment goal is not to suggest any particular change, but to create a context in which the family will generate its own change.

* *

If we question the idea of an expert who treats a mental illness, we also have to question the idea of the diagnosis he/she is hired to dispense. This is particularly true in view of the point made previously about the negative effect of causal attributions that promote blame. Unfortunately, most medical model treatments involve finding an etiology for the symptom before attempting to cure it. This need is obviated in the systemic approach by the assumption of a circular causality and the agreement that there can never be a first horse on the merry-go-round. All elements mutually shape and constrain each other.

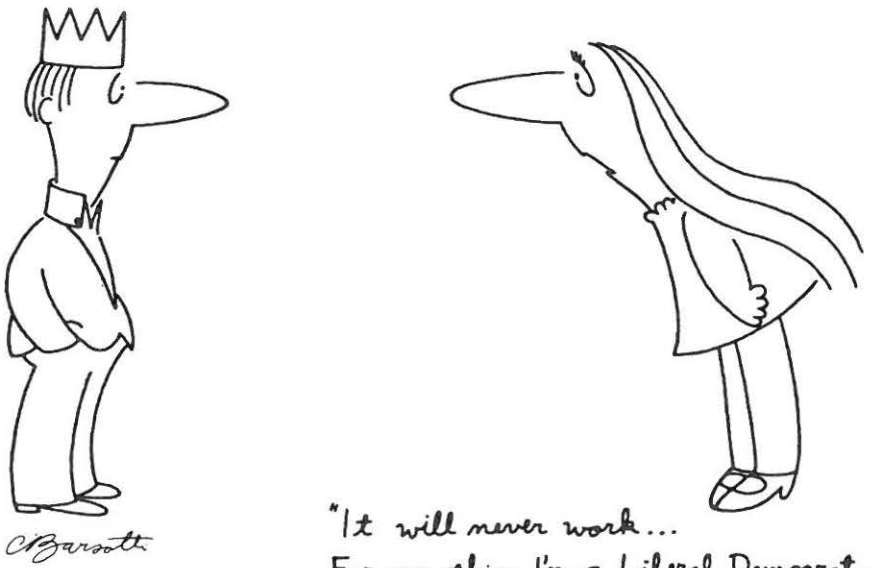
The old epistemology implies that the system, psyche, family structure, the gene--what have you, contains or creates the problem. The new epistemology implies that the problem creates the system. Repeat that, underline that. The problem creates the system.



Another way of doing away with diagnoses is summed up in the Mental Research Institute doctrine of "accidentalism." Problems often start from some trivial cause. The orginal distress, however, is reinforced by attempts to alleviate it, as in the famous injunction, "relax," to a nervous person. (Somebody told me to relax before I came on to do this speech, and I can tell you it doesn't work.) My belief is that the Mental Research Institute has put its collective finger on a central facet of problem formation. Problems are, indeed, stuck recursions, games without end, whether internal or external to the individual, or both. They are not, then, disorders or dysfunctions of the body or body politic, but more like bad habits and evil spells basically extraneous to the system where they take up lodging.

Problems are, indeed, stuck recursions, games without ends...

Consider the story of The Sleeping Beauty. A spell is placed on this young woman at the age of twenty. She pricks her finger and, because of the wicked fairy's spell, everybody in the whole castle freezes and goes into a trance. A hundred years later somebody comes along and stumbles into a way of breaking that spell — some fool prince — just because he thought she was pretty enough to try to kiss. And everyone wakes up and goes on as if nothing had happened. They go on about their business. And, that's the way I prefer to think about problems, as spells of that sort.



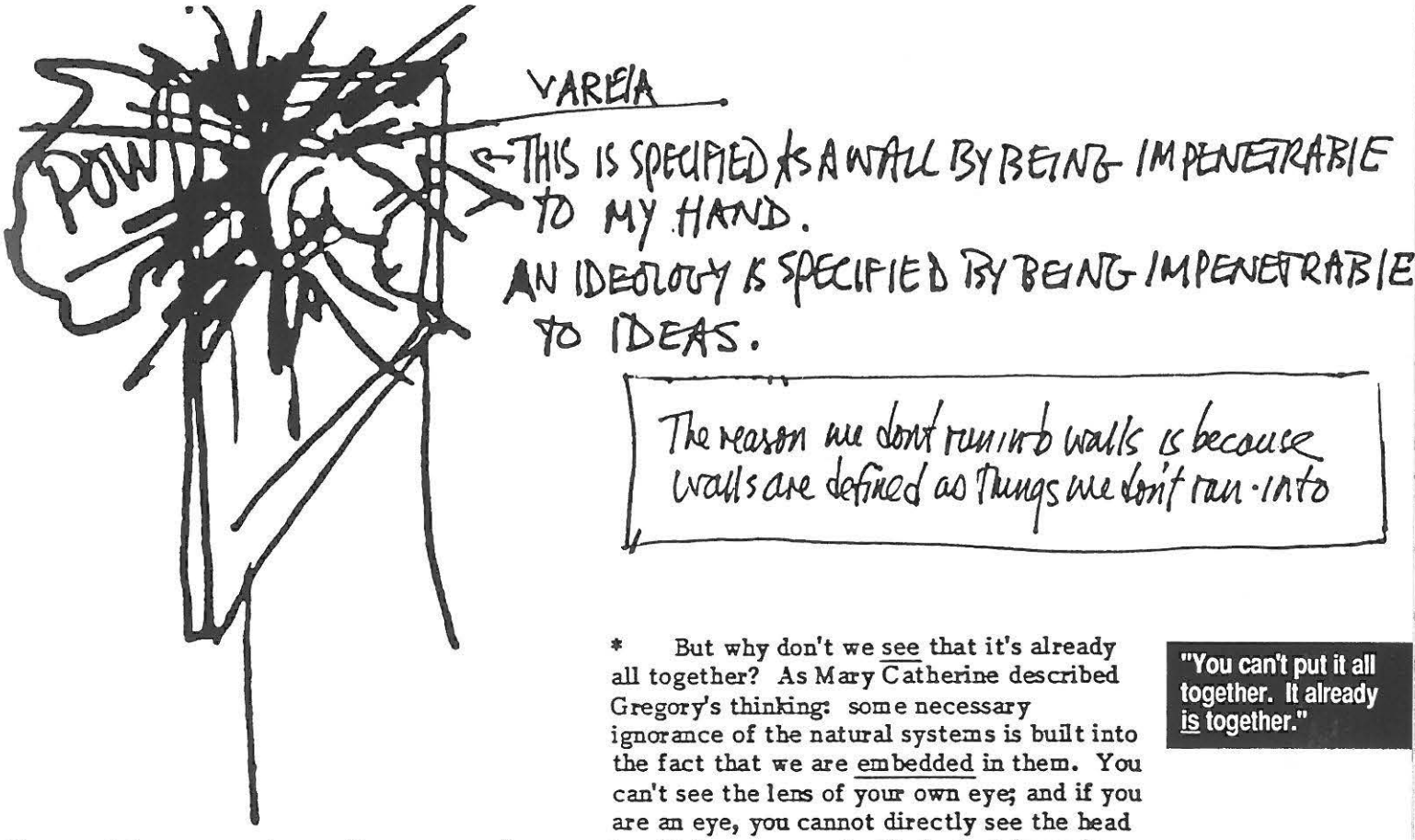
"It will never work...
For one thing I'm a Liberal Democrat..."

ERNST VON GLASERSLELD

A couple of years later, she wants to catch a frog. She knows what frogs are and she wants to catch one. But frogs at that point are just the same kind of thing that are not marbles, that can move on their own and that's it. They're different from beetles, but they are moveable items. So when she experiences this and tries to catch the frog, she will very soon realize that she has a much better chance of catching the frog if she assumes that that frog can see her, and perhaps even that that frog can hear her. What does that mean? It means that she imputes certain abilities that she has long ago imputed to herself to this other item. Now this is as far as I will go because from there to imputing thinking, to imputing goal-directed behavior, to imputing plans and finally to imputing the same kind of construction that I myself make, to other items is not a very large step. It has many small steps but in principle it is not very difficult to see. It is all done, I would almost say, out of the necessity to make predictions about these other items in order to find my way through my own experience in order to organize my experience more efficiently.

So, at that point, I have others, and not only that, I am making predictions about what these others will do under certain circumstances, and the moment I do that, I am in fact imputing conceptual structures, ideas, theories, to these others that I have constructed in my own world of experiences, in my own acting and in my own interacting with things.

Now with that step a very important new feature comes in, because until then what matters with the ideas, the theories and the concepts that I build up, was that they served my purposes. As long as they worked, I kept them. As long as they functioned in the expected way, I stuck with them. If they didn't, I had to change them. I thought up new ones and so on. That's fine. But now if I find that they also work when I impute them to these others to whom I have already ascribed the same capabilities that I have, I get a double confirmation of my truths where truths are all the things that have worked for me so far. Because not only can I say that



they work in my experience, they now work in my experiences in so far as I predict others, but, if my predictions are right, any truths must also work for the others. (Italics by the editor.) This is, I think the only way in which a type of objectivity can come into our constructions, because at that point I am living in a world in which there are free constructors with whom I have to deal in some way and in order to deal with them, I attribute to them practically everything I have become aware of in myself.

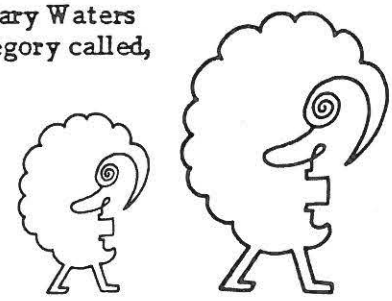
WRAP UP: TYRONE CASHMAN

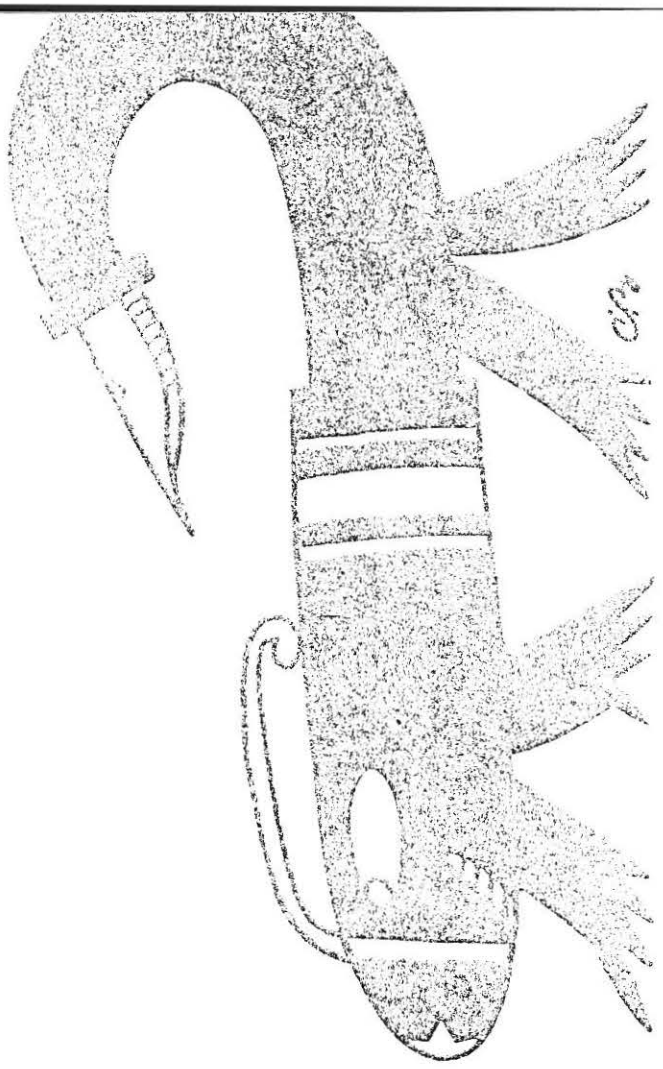
It was decided this morning that I was to take 15 minutes here at the end to "synthesize" what has been said in this Symposium. I felt an understandable anxiety at the task of summarizing so much diverse, deep and rich thinking. But my anxiety was relieved when I recalled the phrase that was printed on the back of the early Whole Earth Catalog, do you remember, next to a picture of the whole earth from space? It said, "You can't put it all together. It already is together."

* But why don't we see that it's already all together? As Mary Catherine described Gregory's thinking: some necessary ignorance of the natural systems is built into the fact that we are embedded in them. You can't see the lens of your own eye; and if you are an eye, you cannot directly see the head in which you are embedded. And, in various ways this ignorance is important to well-functioning, nested, systemic wholes. Especially when it leads to the humility that recognizes the limits of our knowing and of our conscious purposes —and thus opens us to the sacred.

"You can't put it all together. It already is together."

How, then can I relate to whole systems, with this inevitable partial ignorance, but in honesty? Well, as Mary Catherine said: I can acknowledge when I encounter another whole system that is essential to my life." And I can wish this being a chance "to maintain those processes rather than fall to pieces and die." And I can "visualize" that this being and I "could be coupled, combined in a larger interactive system that includes us both." This becomes an "I-Thou" relationship, whether thou art my human friend, a neighborhood raccoon, or the pine/hemlock forest of the Boundary Waters Canoe Area —a response that Gregory called, "love."





* Of all the speakers here, I think Mike Opitz articulated most vividly the theme that became the unifying thread of this Symposium, when he made us hear again the words of Yeats: "O body swayed to music, O brightening glance, how can we know the dancer from the dance?"

It seems to me that each of the speakers pointed out a surprising non-difference of two somethings that we traditionally separate in our minds. For Gregory and Mary Catherine we might say, "How can we know the lover from the loved?"

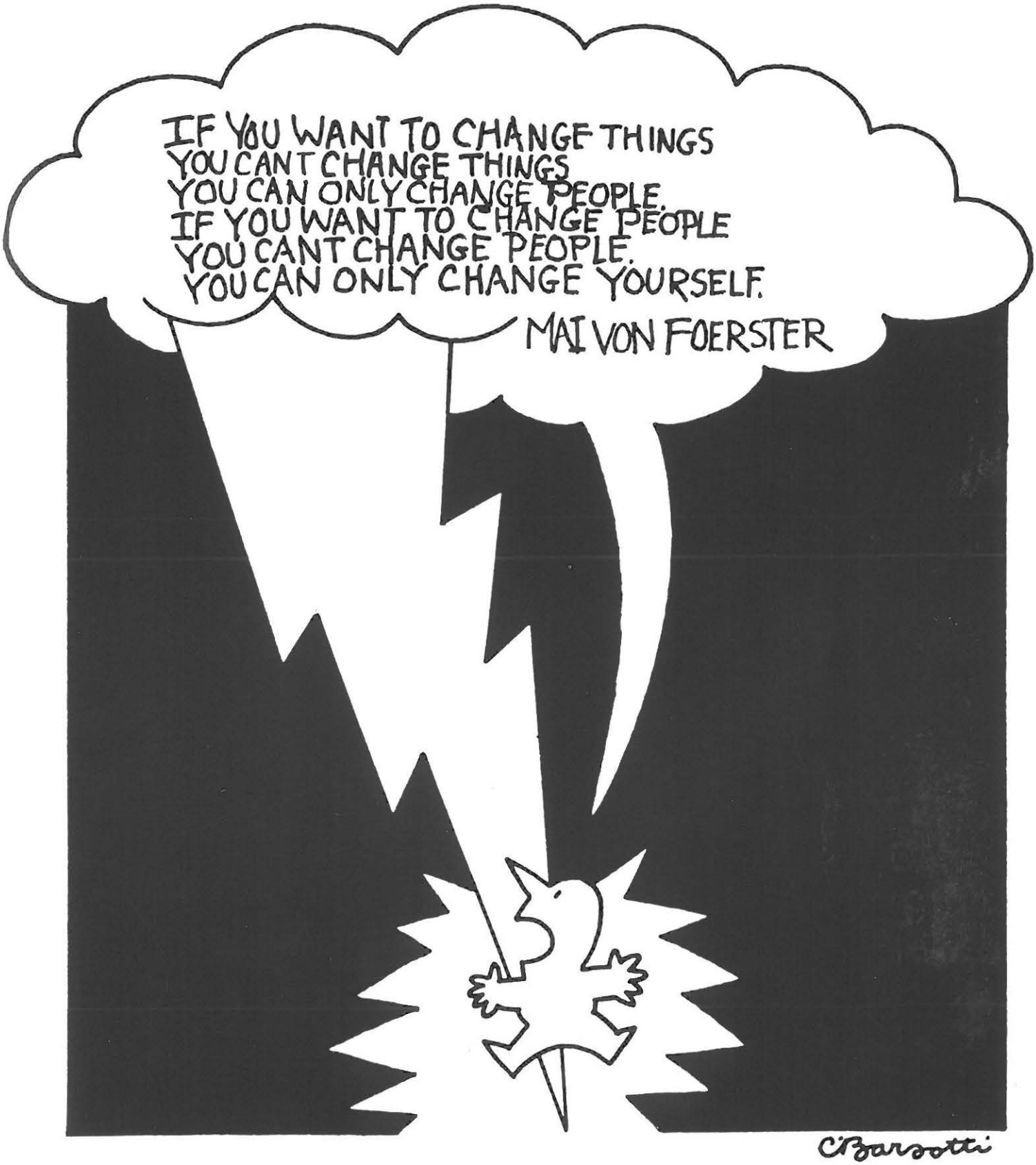
* Humberto Maturana told us that science is not a set of explanations of a world independent of us, but a set of explanations of "the domain of human experiences." He believes that one cannot, fundamentally, distinguish perception from hallucination, with the result that the notion that our knowledge is of an objective world independent of us is more than dubious.

* Ernst von Glasersfeld, working in a constructivist epistemology similar to Maturana's, sees our knowledge as, not obtained from a hypothetical world "out there," but constructed by the inner processes of the individual knowing subject In both Maturana and von Glasersfeld we can hear a Yeatsian echo: "How can we know the knower from the known?"

* Lynn Hoffman tells us that, in a family therapy session you can't look at any individual of the family as the problem, or as the cause of the problem, any more than you can tell which horse is the first horse on a merry-go-round. Families are circular systems of causality such that you have to wonder, "How can we know the blamer from the blamed?"

* John Stolz informs us that "Gaia" is the biosphere, the unity of assembled bacteria, plants and animals in their coordinated action of maintaining a highly unlikely atmosphere and temperature. And then he tells us that bacteria and algae developed billions of years ago, and that the rest of evolution was the complexification resulting from their inter-penetrating each other to become the "eucaryotic cell," which is simply an intimately cooperating "microbial community." Then several eucaryotic cells join together to become plants and animals. When I look at the cells in the skin of my hand, I can ask "How can we know the evolver from the evolved?"

* Father Matt Fox, in opening for us the book of mediaeval Christian mysticism, shows us a theology of immense sweep and intimacy, a way of framing the on-going divine creative event so clearly that we may wonder, with Yeats, "How can we know God from the great, green earth, from the moment of stillness, from painful memories of war, from the person on my right, from the microbe-conditioned air I breathe, from the haunting beauty of an Irish Poem?"


IF YOU WANT TO CHANGE THINGS
YOU CANT CHANGE THINGS
YOU CAN ONLY CHANGE PEOPLE.
IF YOU WANT TO CHANGE PEOPLE
YOU CANT CHANGE PEOPLE.
YOU CAN ONLY CHANGE YOURSELF.
MAI VON FOERSTER
C. Barsotti

HARRY'S FEAR

HARRY HAD PHILADELPHIA FEVER
STEAMY POTHOLES
WITH THEIR LIDS WIDE OPEN
SWALLOWING HARRY'S FEAR
HIS REAL LIVE FEAR
NOT RATIONAL AT ALL
BUT HARRY LOOKS AT ME
EYES ALL SMALL -
"my GOD." IT SCREAMS
"NOTHING IS RATIONAL"

B.K ROCKFORD

18 FICKLE, WAX, TADPOLES

A HUGE TURTLE
CAME A' SNAPPIN' BY
AND THEN THERE WERE NONE!
HA! LAUGHED THE BOLD TURTLE
"18 IN ONE BLOW"
A HA A HA A H
(HE DIDN'T REALIZE IT ATE WAX)

COWPUNCH

TWO FAST CARS
HUGGIN DIRT ROAD CORNERS
STOP SUDDENLY
BY THE PASTURE
SENDIN UP A CLOUD OF DUST
AS THE COWS WAIT - LOOKIN
SILENTLY
TO BE PUNCHED.

HA HA HA
HA HA HA
HA HA HA

DYLAN T. : EACH BOX IS SEPERATE

'DIS SUMMER I HAVE WRITTEN 65 POEMS

SO WHERE IS YOUR SPARE BRAIN?

CHICKEN WITH KEY

LA LA LA
LA LA L
LA LA L
LA LA
LA LA

URN ART STUDENT

INDIVISIBLE PATRIOT

THE ALABASTER ASIAN AND TOBIAHS THE FIFTH-BORN

POEM TIME BECAUSE I DON'T FEEL LIKE DOING ANYTHING ELSE EXCEPT THAT RIGHT NOW SO HERE WE GO, PENNY?

COTTON PUFF

THE LUNATIC SAT ALL DAY
ON THE RIVERS EDGE
AND FROM A BOX OF COTTON PUFFS
HE WOVE A COTTON FISH -

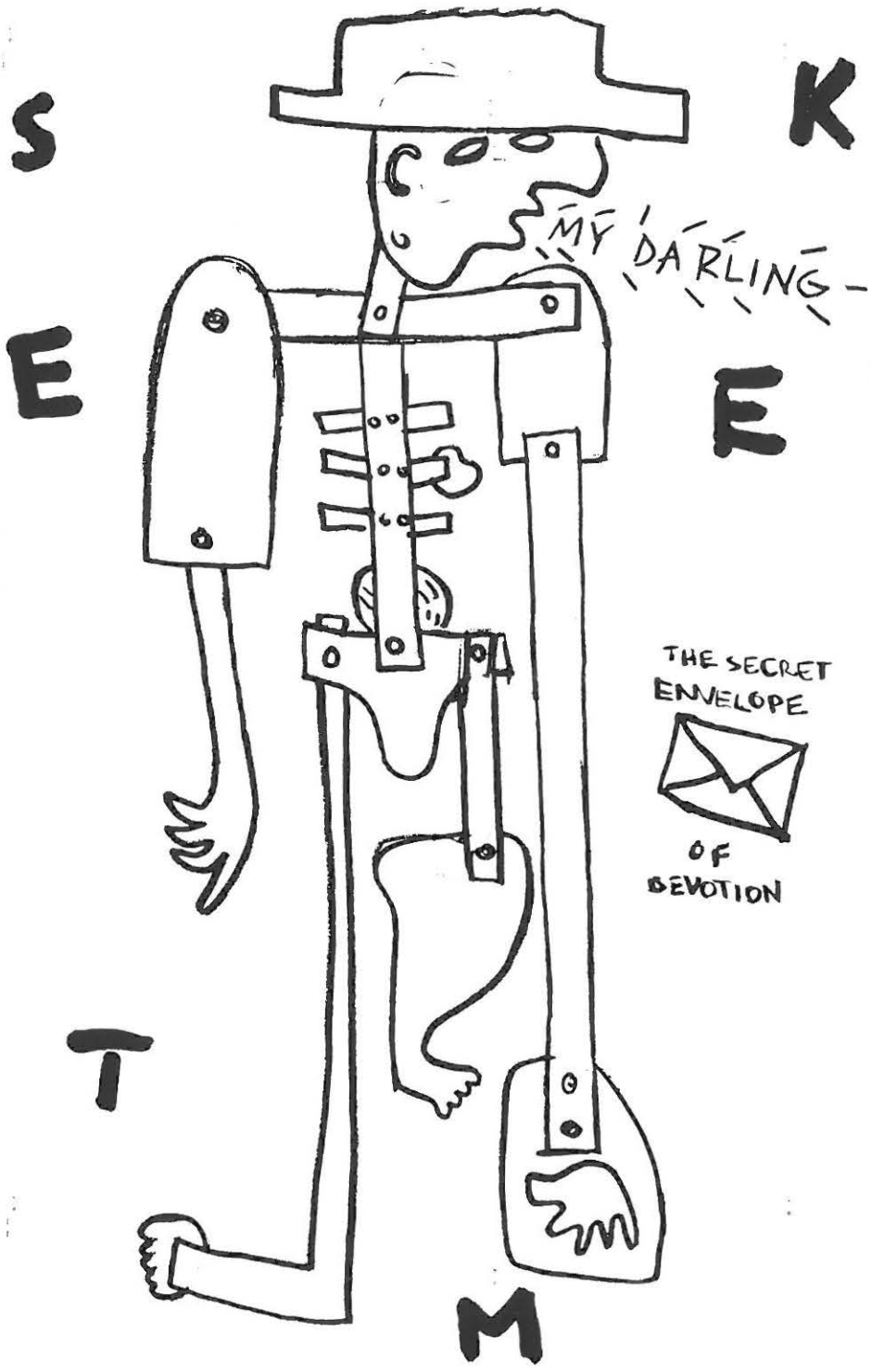
HE THREW HIS FISH INTO THE WATER
SHOUTING "SWIM, BOY, SWIM"
AND WAVING HIS GNARLY HANDS
BUT SOMETHING ELSE HAPPENED

TWELVE TURTLES CAME AND UNWOVE THE FISH
USING THE COTTON TO KNIT TURTLE SWEATERS
THE LUNATIC CRIED ALL NIGHT
AND WHEN DAWN CAME
HE WAS NO LONGER A LUNATIC
BUT HE WAS BORED

DEDICATED TO OUR CAMBRIDGE CONVERSATION

REFLEXIONS ON LOVE

by Humberto R. Maturana
University of Chile



Dan Oliver

Whenever I speak of love, my audience, however this may be composed, because uneasy. Love is a dangerous word. It seems that we usually think that love is too human to be accessible to the reflexions of a scientist. But, is it indeed so?

What I think is the following: Living systems may interact with each other recurrently. If they do so their ontogenic structural drifts, that is the paths followed by their continuous structural changes, follow courses contingent to their recurrent interactions, and their ontogenies become coontogenies or coontogenic structural drifts. As a result an observer may see coordinations of actions which, if they constitute recursive coordinations of actions upon coordinations of actions, become language. But at the same time what an observer sees are social phenomena, that is, phenomena of coexistence, of living together in a domain of coordinations of behaviour in which the life of the participants is involved as such. Socialization results from recurrency of interactions that result in living together in a coontogenic structural drift, and language is a manner of living together. Yet, how come that living systems interact recurrently? Ho come that we human beings interact recurrently and become social, and even languaging entities?

My contention is that we human beings interact recurrently under circumstantial constraints (expernal pressure), out of intentional design with the purpose of obtaining something, or spontaneously, out of no reason, in the pleasure of it. Indeed, it is my contention that this latter case, the recurrency of interactions in the spontaneity of pleasure without justifications, is the phenomenon of socialization. Or, in other words, it is my contention that social phenomena are the phenomena of coexistence that takes place when living systems spontaneously interact recurrently with each other in the flow of their living just because it happens to them in their conservation of organization and adaptation. Moreover, I claim that this

spontaneity of recurrency of interactions in living systems is expression of their circumstantial structural congruence: two, or more, living systems begin to interact recurrently with each other because they spontaneously fit together in the dimensions of the domain in which their recurrent interactions take place.

I claim that this condition of spontaneous dynamic reciprocal fitting that gives rise to recurrent interactions with conservation of individual organization and reciprocal adaptation along the ontogeny of living systems while it lasts, is the phenomenon that we call love in the human domain. Or, in other words, I am saying that love is the spontaneous dynamic condition of acceptance by a living system of its coexistence with another (or others) living system, and that as such love is a biological phenomenon that requires no justification: love is a spontaneous dynamic reciprocal fitting, a happening that either takes place or does not. As a spontaneous dynamic reciprocal fitting, love either occurs or does not occur. If love occurs, there is socialization, if it does not occur, there is no socialization. Furthermore, I am also saying that as such, love is expression of a spontaneous structural congruence that constitutes a beginning that can be expanded or restricted, and even disappear, in the coontogenic structural drift that begins to take place when it takes place. And, since I say that social phenomena are the phenomena that take place in the spontaneous coontogenic structural drift, I am also saying that love is the fundament of social phenomena and not its consequence, and that social phenomena is any domain of interactions last only as long as love lasts in that domain.

I can also say this in a slightly different manner when speaking specifically about what happens with us human beings in this respect:

Love consists in opening a space of existence for an other in coexistence with oneself on a particular domain of interactions. As such love is expression of a spontaneous biological congruence and has no rational justification: love takes place because it takes place and lasts as long as it lasts. Also love is always at first sight, even when it appears after circumstances of existential constraints that force recurrent interactions; and this is so because it takes place only when there is an encounter in structural congruence, and not before. Finally, love is the source of human socialization, not a result of it, and anything that destroys love, anything that destroys the structural congruence that it entails, destroys socialization. Socialization is the result of operation in love, and takes place only in the domain where love takes place.

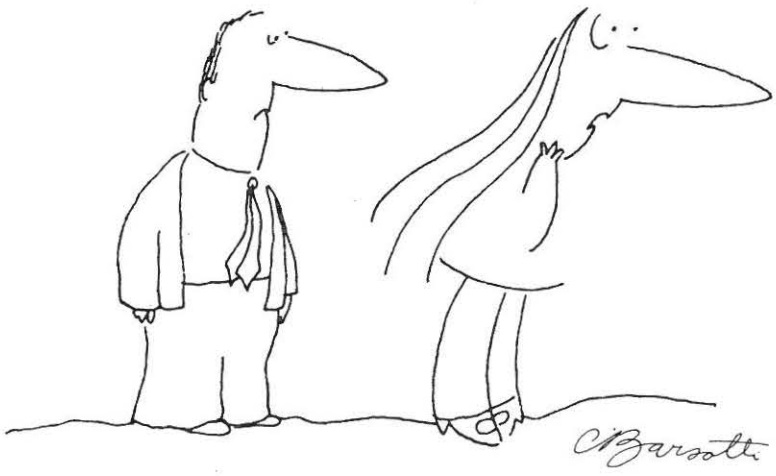
There are several difficulties for understanding or accepting what I say about love; I shall mention two:

a) We like love to be something special, and to say that it is such a humble biological phenomenon as a mere structural congruence that results in the recurrency of interactions, is not pleasant, it destroys a myth. Love is not a special human phenomenon, but in humans it may take place in such few dimensions as those involved in the simple coexistence of going together in a train in mutual respect, or it may take place in many dimensions as when two persons live together as a loving couple, or it may even take place in the peculiar dimensions of coexistence in which one may live with a pet. What is especially human in love is not love, but what we do in love as humans.

b) We like love to be a consequence of socialization, not its source because we like relations that destroy love such as competition, to be legitimate social relations. Competition is antisocial, competition as a human activity entails the negation of the other by closing its domain of existence in the domain of competing: competing negates love. Members of modern

Members of modern cultures praise competition as a source of progress. I think that competition generates blindness because it negates the other and reduces creativity, reducing the circumstances of coexistance.

LANGUAGE IS A WAY OF LIVING, IT IS NOT ABOUT SOMETHING. WE EXIST IN LANGUAGE.



OH, GOD, LEONARD, WHAT IF YOU ARE MISTER RIGHT ?

It is through reason that we justify tyranny, the destruction of nature or human abuse in the defense of our possessions, material or ideological.

cultures praise competition as a source of progress. I think that competition generates blindness because it negates the other and reduces creativity, reducing the circumstances of coexistence. The anthropological origin of homo sapiens is not through competition but through cooperation, and cooperation can only take place as a spontaneous activity through mutual acceptance, that is, through love.

What makes us human beings is our particular way of living together as social beings in language. And in this particular way of coexistence that makes us human, love is the biological phenomenon that permits us to escape from the antisocial alienations that we bring forth through our rationalizations. It is through reason that we justify tyranny, the destruction of nature or human abuse in the defense of our possessions, material or ideological. We justify tryanny by claiming that other human beings should obey our whims about truth or reality because we possess a privileged access to them; it is through reason that we justify the destruction of nature in its subordination to our designs because we possess it; and it is through reason that we claim that human life should be subordinated to some transcendental purpose. But love, the biological claim that makes us accept the presence of the other besides us without reason, brings us back to socialization and changes the reference of our rationalizations. The acceptance of the other without demands is the enemy of tryanny and abuse because it opens a space for cooperation. Love is the enemy of appropriation.

The acceptance of the other without demands is the enemy of tyranny and abuse because it opens a space for cooperation. Love is the enemy of appropriation.

If we accept the other, we can justify his or her presence with reasons that validate his or her presence: love or not love commands, and social ethics begins there. We human beings are not rational animals, we human beings are animals that use reason, language to justify our emotions, whims, desires . . . and in the process we devaluate them because we do not see that our emotions specify the domain of rationality that we use in our justification. But at the same time we are animals that through reason, through language, can become aware of their emotions, and thus experience their change, and in this, love is central. We exist as human beings in social existence, and language, reason, and self-consciousness arise and take place as social phenomena: without socialization there is no language, no reason, no self-consciousness, no awareness of emotions, and without love we are not social beings.

This is not an apology for love. This is only an invitation to reflect on the biological condition that is at the base of humanity. I am not even recommending love, I am only saying that without love as a spontaneous biological phenomenon there is no socialization, and this is not trivial in human life.

LANGUAGE IS NOT ABSTRACT. ITS ACTION; IT'S THE COORDINATION OF ACTION. LANGUAGE TAKES PLACE IN CONCRETE STRUCTURAL ENCOUNTERS, WHICH IS WHY WE CAN KILL EACH OTHER WITH WORDS.

MATURANA

"Conversations" with Humberto Maturana, Oxford, Summer, 1985

In the summer English downs,
Covered by a rain of poppies, loosestrife and feverfew
Lines of hedgerows folded back and thickened over cliffs of clay and chalk
The English gardens
walk their paths around me
claiming in defiant, secular banners of rose and delphinium
the Reality of their objective selves.

Waterways
fluent over transparent, minerature forests of duckweek and cress
Rising quadrangles and Gothic spires representing canonical authority
and the matter of History
remind me that Heresy
is punishable by exclusion.
Disintegration could be the outcome of these ideas of "constructions!"

"Apostate!" they cry,
"We are before during and after you!
We suffer no dependence or ambiguity,
Your ontological eddies and whorls are fictive
and lesser to our stone and sun of historic time!"

My mind's eye taking aim I counter,
"Be careful! Or I will talk about you as if you were not here!:
"Froth" they sneer,
and curling their great stone lips
they arch and picque and draw up to high dudgeon.
I continue, "And without me you may fall in the forest
and not make a sound!
There is the matter of objects arising through language!:
They rasp, silenced, mutely fixed in my construction.

Now mere stepping stones, I lift from their tops in a bath of air
Ballooning beyond the patchwork of English green
free from their concrete petitions
from mortared obligations to school and church
ways and means
lecturns, islands
afternoon stars
seeds and swords
hope of hopes
History of History
Daily and nightly I drift
and the air is my co-inspiration.

by Peggy Penn

THE IGNORANT LUST AFTER KNOWLEDGE

I come in from the canal. I don't know anything.
It is well and good to ask what we need to know
as if it were all, as if we didn't need.

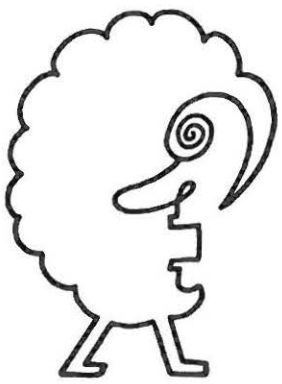
Well, I need. I may never know anything
but I need. One sees desire not
as something to satisfy but to live with.

A light, this side of the hills toward Argyle,
flowed like fog through the hollows, rose to the depth
of the hills, illumined me. I faded in it
as the world faded in me, dissolved in the light.
No one to know and nothing knowable.
Oh, we know that knowing is not our way;

but, the choice ours, would make it our way, would leave
the world for the same world made knowable.

EUCLIDEAN SPACES: LINEAR TIME

They come home. They come back. They find their way to us.
Sniffing. Nudging our legs with their noses. They are ours.
Whose should they otherwise be? They curl content.
Discarded animals we thought we could lose
by losing them. Damn them! Here they are.
Who are we? Being men, we thought to be without
the both of them. As we are. We know we are.
But they find us again. And what are they, but two
we thought of once, and liked, and took them in
for a comfort, for something close? We may have been wrong.
It seems to me now that we were. But after all,
the immensity, the endless world. We need,
sometimes, to have something by us. The trouble is,
it works both ways. Here they are, like real
creatures, making their claims, not letting us go.



"Euclidean Spaces; Linear Time" and
"The Ignorant Lust After Knowledge"
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Press, 1981). Reprinted by permission.

PRESENT NOT ACCOUNTED FOR

We say the earth or the world made us among
the others, the still unnumbered multitude
of flowers, edible plants, the fishes and birds,
all fierce and fearful animals and gentle ones
-unhurried the earth or the world as if forever-
or sun -say the sun whose strength afforded us
or say the process, itself, unstoppable
once started.
We are accountants who make
our computations unfazed by infinite
intricacies of whatever mechanism
if it fixes accountability but these
are no more than another god brought out
of another machine and I say too easy an out.

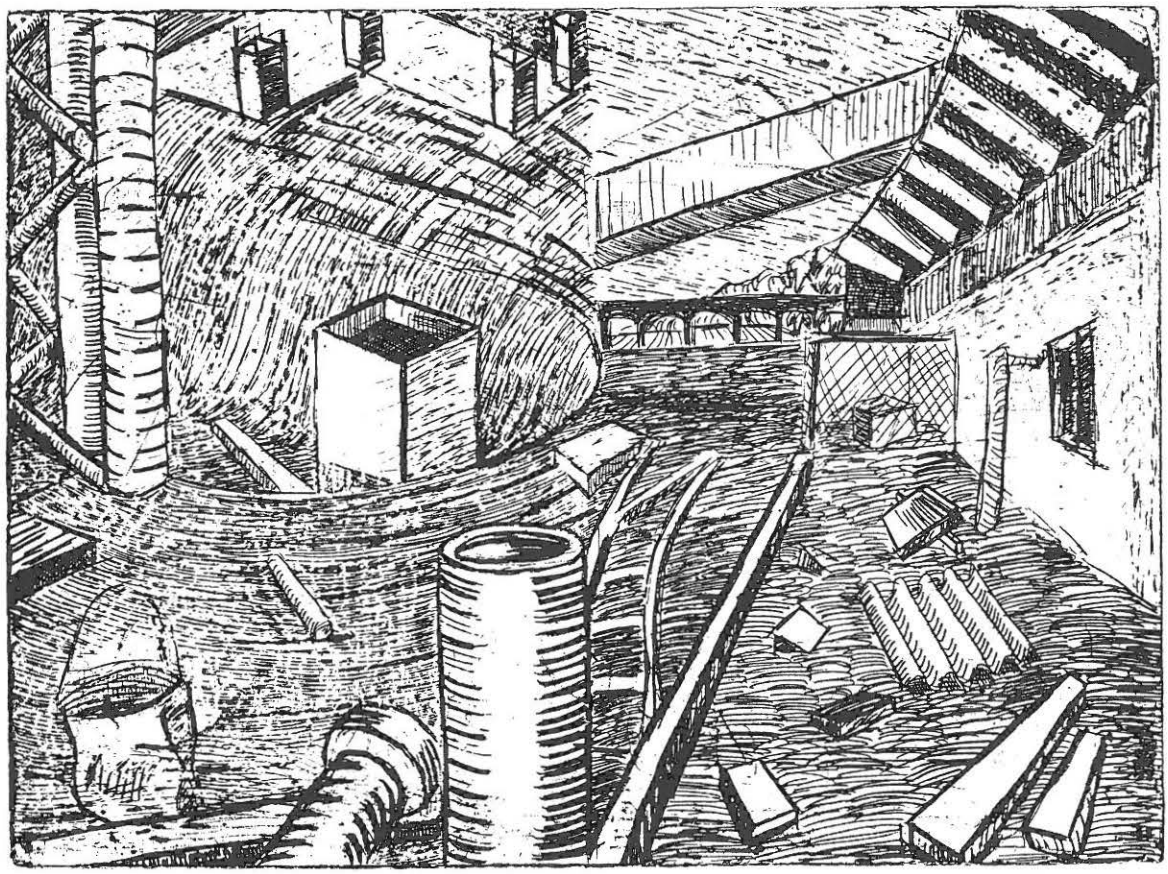
THE AGE OF SCIENCE

Proven truth is something for everyman
except for the ones who won't listen, won't learn.
We can show them but we can't make them believe
-that wouldn't be rational anyway and we don't
try. Admittedly, we don't have
the whole thing; that's what our method's about
but, at least, we have a method at last and if
it doesn't work I don't know what we can do.

GUIDED TOUR

I am sorry to disappoint you and I know
you expected a lot more but the distances
of the universe are right here. You
wanted mysteries which could be explained,
made understandable, as your disappointment is,
I know, because I, too, am embarrassed to say
it's no more than this which is just what we knew
since we knew anything. Well, take a look.

- William Bronk



OF KNOWING, TELLING, AND SHOWING

by Ernst von Glasersfeld
University of Georgia

I know that I know but not how I know what I know. It's a puzzle I like to play with.

What I know is what it is, for if it were not, I could hardly feel that I know it. (If something were so different that I didn't feel "Ah, this is such-and-such!", well, then I couldn't feel that I know it.)

As Socrates said, to know is to recognize.

The moment he said that, he jumped to a conclusion: if something is recognized, it must exist; and by "exist" he meant exist by itself and for itself, which is to say, it had to be "there" whether he knew it or not.

Socrates, of course, did not invent this. He merely said what everyone feels when he "recognizes" something.

In fact—

note that "fact" comes from facere, "to make" (see Vico), and whenever one says "in fact", one is actually saying: "the way I've made it."

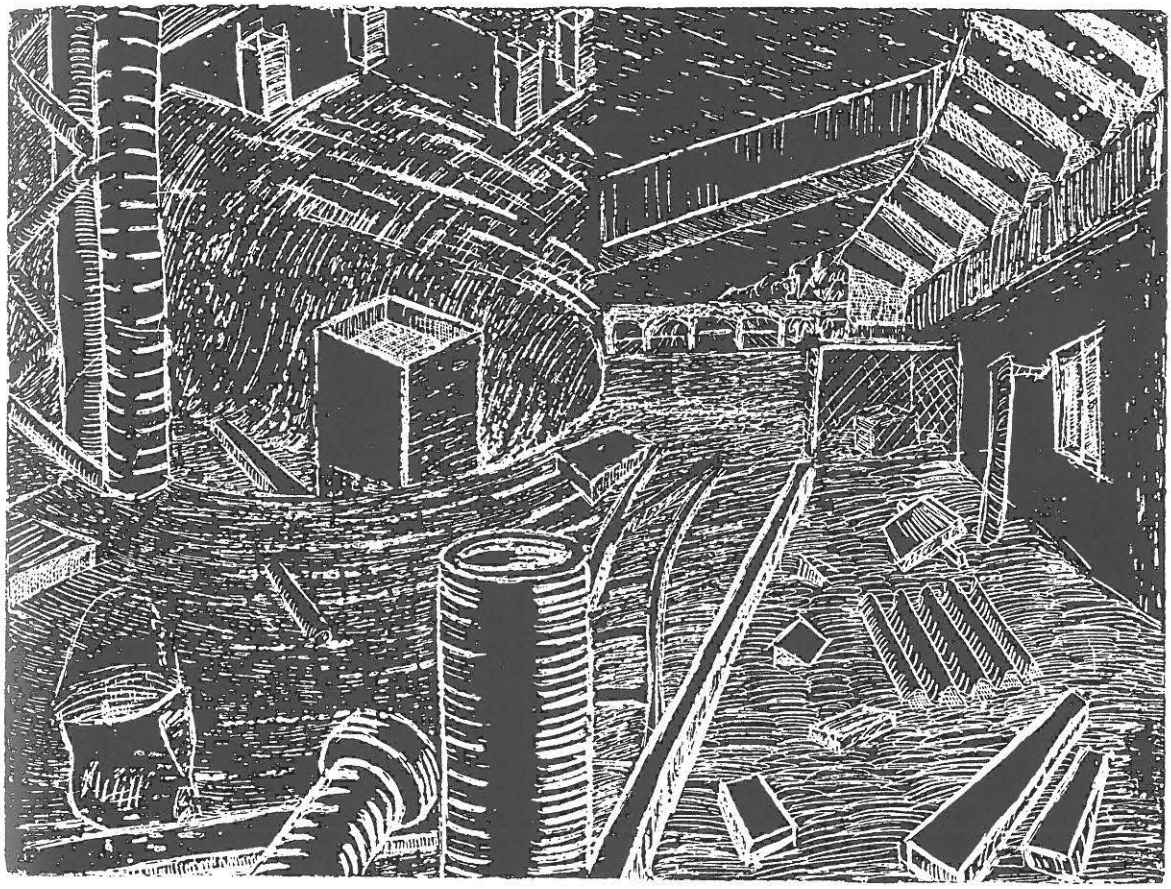
In fact, the trouble with "existence" started, with the very first line of this text, because "to know", given the way we normally use it, implies a split between two things, one that does the knowing, and another an "it", that is submitted to that act.

Every time words are used, words such as "it", "what", "he", and "she", or simply names of items which we somehow feel we recognize, we tacitly assume that these words point to some things, things that "exist", things that are "there", whether we mention them or not.

But if any such thing were "there", how could I "know" that thing here, where my mind is?

Light waves, you say, or photons?

How would one know about these? Light waves and photons (and Professor Gibson's "invariants") may be quite useful fictions to "explain" some mechanism or other, but they are certainly not what you and I see when we look at each other, a landscape, or a rose. The rose that is the rose that I see, smell, and know is exquisitely my own. It's not yours or anyone else's, and it's certainly not a physicist's explanation. It's an item I have concocted of bits of my own experience. (Rosa mea facta est.)



Etchings by Dan Oliver

The mystics, of course, and some that would not want to bear that name, speak of other forms of knowing or simply assume that they have another way. I have no reason to deny it, but if there is another way, I should not call it "knowing". Indeed, the way I make it or feel it or see it, I would not call it at all.

Wovon man nicht sprechen kann, daruber muss man schweiqen.

God bless Wittgenstein. When he made the distinction between showing and telling, he liberated the theory of knowledge, which, in the West, had been blocked for thousands of years. It's not his fault that epistemologists are slow to budge.

But Wittgenstein added: "What can be said at all, can be said clearly."

So let us try to be clear. What can be spoken of, can be told. But to be spoken of, it must be named; and to name it, the speaker must distinguish it from self. One cannot name what one does not know.

Hence the problem of reference, a problem that does not go away, even if one comes to see that language is interaction. In addition, there is the problem of reflection, and this does not go away either.

Here is an illustration: If you want your child Sue to come into the garden, you can pick her up and carry her there. That is interaction, and it will be successful (provided Sue is light enough to carry), but it's not "language".

However, you can also raise your sweetest voice and call: "Darling, would you come into the garden!" That, too, is interaction, but doesn't always work. If it is successful, this may be due to one of three things:

1) a history of calls and reinforcements that has conditioned Sue to go to daddy at the stimulus "Darling", much as a well-trained spaniel comes when called;
2) a history of interactions that has led Sue to parse the sequence "come into the garden!" as one of many possible combinations of signals which, in particular contexts, require a specific motor action;

What we cannot speak about we must pass over in silence.

3) a history of interactions that has led Sue to interpret the utterance as an expression of something that's in daddy's head; something that must itself be interpreted through re-presentation of past experiences with daddy's expression of wishes, with his tendency to say "garden" when he intends "vegetable garden", with the path to it, etc., etc.) and must be evaluated in relation to other possibilities, and which, in this instance, leads to the decision to do as requested.

The way I see it (because that's the way I have made it), this illustrates four types of interaction. Only the last one has the components I require to use the word "language" in the sense I want.

Pushing or pulling others, dragging or carrying them, are no doubt social interactions. As such, they may be modified by all sorts of conventions; but, even if they are, I would not call them "language".

The conditioned response springs from a link the experiencer has established, a link between a sensory experience and a motor action. Even if the stimulus is a "word", because the stimulator (and others) consider it thus, I would not call the interaction "language".

The complex utterance that requires parsing in a context, is "linguistic" in just that respect. Yet, because the outcome of the parsing is still no more than a fixed connection to a sensory-motor pattern, a trigger for a specific way of acting, I would still not call it "language" in the full sense of the term.

Only in the last instance, where the utterance calls forth re-presentations, the re-play of past experiences in the receiver's mind, only in that case is the interaction truly different from all other forms of social interaction, and the difference is an exclusive characteristic of "language".

The crucial difference, for me, is this: Whatever is called forth by the piece of language, the items it refers to, are items that have been abstracted from experience. They may, but need not, have any immediate link with sensory-motor experience that is going on, nor any link with present or future manifest behavior. Yet, what is said or heard is not without effect. But the effect is on the language users' acts of re-presentation.

Another illustration. Assume I say: "There's a picture in the Louvre in Paris, a picture of a woman who is famous for her smile." You have immediate access to a past experience of yours, or several maybe, and you can visualize the Mona Lisa (even if, for the moment, you cannot recall her name).

My utterance (written, in this case) is not connected to a specific chain of action of mine nor with some manifest behavior I might expect of you. I used the sentence as an example to show the effect of language on the flow of your re-presentations.

The real power of language is this power to call forth re-presentations of past experience or what the language users have abstracted from it, and what one abstracts from one's experience is "knowledge".

This way of seeing "language" does several things. It makes clear that "to understand" is to be able to fit (more or less satisfactorily) re-presented abstracts of one's own experience to another's words that one hears or reads. If the composition one ends up with seems contradictory, one feels one has not understood, or that the other is in some way out of order.

Understanding language, therefore, requires continuous checking and evaluation of the re-presentations the other's words call forth. And this, at once, raises a question: Who is that observer, that entity that looks at and evaluates its own "knowledge"?

So we come back to the beginning.

I know that I know, and I may know what I know, but not hoe I know nor who, exactly, it is who does the knowing.

We have no qualms about calling that entity "I" or "myself". But when we call on it, in our tentative investigations of knowing, some stop us at once and say: "ha, ha! You're introducing a homunculus!"

That used to embarrass me, and I took a long time to think of simply asking back "Why not?" and "Who, in you, makes up your mind to question what I'm saying?"

If something is to be spoken of, it must be named; and in order to name it, the speaker must distinguish it from self. That, of course, is what I do when I speak of "myself"—I treat myself as an "other", as an item that I can observe, an item that is no longer the one that does the observing.

The secret thrives and remains untold. But every now and then a shadow of what it may be shows itself in silence.

Linocuts by Dan Oliver

Charcoal drawing by Dan Oliver

LEARNING AS GUIDED CONSTRUCTION

by Patricia T. Clough
Fordham University

In the years I studied at The Biological Computer Laboratory (BCL) at the University of Illinois, Champaign-Urbana, so many encounters were "moments of excellence", as Gordon Pask uses the term in talking about teaching and learning. Now, when I think of telling you what I learned at BCL, I want to put it this way. I learned a sentence: the observer observing himself in his observations. In the years since I left BCL, I have tried hard to bring that sentence to a variety of discourses, to make it perform within those discourses. In reading Heinz von Foerster, Chicho Maturana, Gordon Pask and Gotthard Gunther, I also learned through the experience of their glee, their delight in the subversion of "older" discourses. I wasn't then always able to judge whether that subversion produced more effective, more correct descriptions of the nervous system or cognition, for examples, but I took away with me that desire to gleefully subvert discourse. And now I want to further the subversions by performing within our discourse the sentence: the observer observing herself in her observations.

I

Since I am trained as a sociologist, I am not oriented to talk about learning, embedded as it is in educational psychological discourse, but rather am oriented to a critical understanding of institutions of education. My remarks, therefore, will be limited to the notion of the guide as in guided construction - the guide, who I will think of as a teacher, a teacher in the classroom. But it is not so much a mere dismissal of the psychological that I am after. No, rather what I am about to do is to take strategically irresponsible steps to make visible, in order to problematize, the privileged position which a sociological understanding of intersubjectivity is attaining in constructivist thought, which understanding serves to situate the psychological subject of learning.

In that light, I mean to play with constructivism, especially one of its implications; as Ernst von Glasersfeld puts it: "constructivist thought inevitably leads to the contention that man and man alone is responsible for his thinking, his knowledge and therefore what he does." I want to play in order to take seriously the deconstruction of the phrase 'man and man alone', now in progress, defined as the deconstruction of Marx and Freud, and to make use of that deconstructive work as a way of tracing how the teacher arose to function as a support for man and man alone in his thinking and action and how the teacher was thus opened to question as one whose authority is always suspect - a problematic at the heart of constructivist thought which demands a guide but can permit no particular authority to a teacher.

I want to play in order to take seriously the deconstruction of the phrase 'man and man alone'...

II

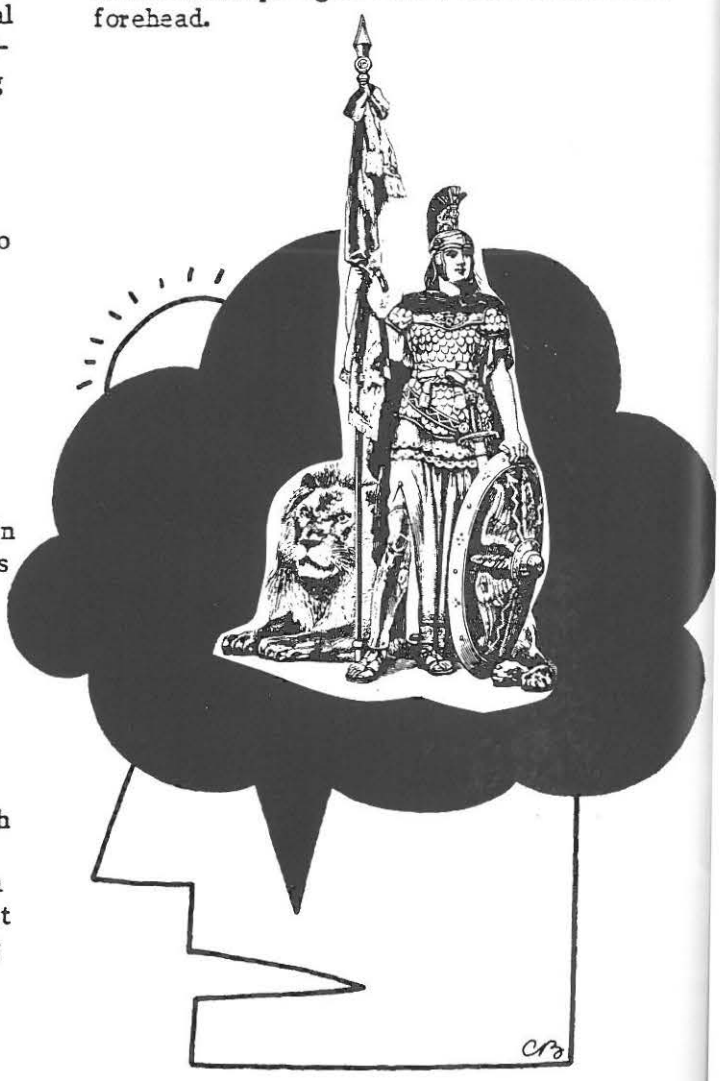
If once we could say that Marx and Freud guided any and every analytic construction of the bourgeois individual - a self in society, we must now admit that the deconstruction of Marx and Freud guides what can be described as a shift from analysis (which is always of that individual) to writing: on the one hand the writing of post-bourgeois subjects, post-colonial subjects into discourse and on the other hand, the rewriting of Freud and Marx. Since now we recognize that discourse props up analysis, stages it, but that discourse is itself an institutionalized writing, what we may call a discipline, a deployment of power coming back at us as if not of us, then the deconstruction of Marx and Freud aims to go further back, behind discourse so to find out two great thinkers while writing. Not so much as authors but as nodal figures in a discursive shift; as if to find them before or better as they are stiffening themselves up to become progenitors of their own discourses. Such moves toward writing I want to argue are moves toward the obscene, to that scene which comes before, as that which has been forgotten, as what can not be looked at in the face and thus as that which must be staged as a scene to be seen but where always the staging can become invisible as it becomes the stage.

Indeed, if there is one thing that is being staged in Derridean deconstruction, it is Freud's writing. As for example in Sarah Kofman's deconstructive, The Enigma of Woman, what is scened is Freud's writing on women, as he frames his knowledge toward one solution rather then another, one which is more gratifying; an interested solution as if to ward off some formidable danger. What Kofman is thus able to make visible at the scene of Freud's writing are the solutions not chosen. Specifically from Freud's self-described heroicism at being able to deal within himself, with his confrontation with his mother, Kofman draws out the way the son expresses in language the myth of the mother's truth which the mother only makes visible. The son gives the authority of the word, of scientifically accredited theory, to her visual demonstration but not without his attributing to her a lack, a fault as by to deal with her refusal to speak with him - her self-sufficiency. By way of the most outstanding of modern examples, I am suggesting the possibility of drawing out from and then placing against scientific discourse, a scenography of screen memories - a theatre of frames of knowledge profoundly related to the obscene, to the scene of writing and to the maternal genitals because about her genitals, it is said, they cannot present themselves as such - a construction is needed. So at the site/sight of the mother's genitals, the notion of inaccessibility of the real is counterbalanced by the notion of the necessity of grounding visual demonstration with the authority of the (son's) word. And in contrast to von Foerster's notion of blindness - neither as something present nor as something absent - blindness politically conceived brings us to the construction and deconstruction of Oedipus or at least to figures of a narrative which not only allow for covering over blindness with a seeing of absence, a veiling which invites man to ask what is behind it, but thus equates truth with verbal revision, opening the past to the future through therapeutic confrontation - a guided construction. And it is here we might note, that the teacher is theorized as taking on the paradoxical position of a guide to truth who must yet disappear in face of man's own responsibility.

To teach from the body of the mother instead of from the head I had been so finely tuning! Can one teach from the body of the mother?

III

In 1977, I became a mother and I began teaching sociology. The program director suggested I teach Sociology of the Family. I protested; I had not studied Sociology of the Family. He replied, "Sure you can teach it; you are a mother now." To teach from the body of the mother instead of from the head I had been so finely tuning! Can one teach from the body of the mother? Can the mother's body be a guide - a masterful user of words? Or will she not be in the place of the obscene, an impetus for forgetting, for framing her away into the visible but mute? Surely, one should avoid all this, resolve the apparently contradictory relationship of mastery and horrific mystery by teaching from the head, as the professional woman, like Athene sprung in armor from the father's forehead.



IV

In 1977, I began teaching Sociology of the Family. In 1977, Roland Barthes published two essays; one well known, "The Death of the Author", the other less known, "Writers, Intellectuals, Teachers". The trouble with teaching, and for Barthes teaching is troublesome, is that it is not writing. The teacher speaks and since the spoken word is clear, it banishes polysemy. Thus speech serves the Law, taken here in the Lacanian sense, the Law of the Father which, through language, positions the speaker in terms of the Law. The teacher is always in the place of authority.

For Barthes, the teacher speaks, the intellectual writes what he has spoken. But as for writing, writing begins where speech becomes impossible, in the sense of a child's becoming impossible. Writing is the site for transgressing the Law; could we say, what is cast away in resolutions can still be staged by the reader who rewrites the text? Writing of course belongs specifically to the modern where temporality is difference, can be made different, as Barthes makes this contrast in "The Death of the Author":

> The author when believed in is always conceived of as the past of his own book... He is thought to think, suffer, live for it, is in the same relationship of antecedence to his work as a father to his child. In complete contrast, the modern scriptor is born simultaneous with the text, is in no way equipped with a being preceding or exceeding the writing.

In the modern, the teacher is therefore likened to the author of another time and the Father of our times, while writing is conceived as Kristeva would put it, as the 'maternal text', that which comes before the law of the father and returns to shatter his verbal authority.

The maternal text? But why, then does Barthes claim, as he does, that Penelope is the eponymous figure of the speaker, the teacher, not the writer. He explains his claim,

> The correcting and improving movement of speech is the wavering of a flow of words, a weave which wears itself out, catching itself up, a chain of augmentative corrections which constitute the favored abode of the unconscious part of our discourse.

Thus, the teacher according to Barthes is the one in the student-teacher relationship which is analyzed as in psychoanalyzed without however, the student gaining the authority of the psychoanalyst. The important terms here are augmentative corrections in contrast to modern text which does not add up an author but is irreducibly plural in meaning; the text's logic being metonymic rather than comprehensive and the psychoanalytic practice criticized here is one which adds up, as adds the ego up and where rewriting is not permitted only verbal revision.

"It seems that women have made few contributions to the discoveries and inventions in the history of civilization." Freud

But there is an excess at the word weave. On one hand, it refers to the teacher who makes comprehensive, but text comes from the Latin 'textus', past participle, 'texture': to weave. So on the other hand, 'weave' refers to writing, to textuality. I am suggesting that the writer and teacher are placed in a paradoxical relationship to each other - twin figures productive of the discourse of cynical authority in the age of modern man

And let me add one other reference to weaving on my way to a first conclusion. It is to Freud on weaving:

> It seems that women have made few contributions to the discoveries and inventions in the history of civilization. There is, however, one technique which they may have invented - that of plaiting and weaving. If that is so, we should be tempted to guess the unconscious motive for the achievement. Nature herself would seem to have given the model which this achievement imitates by causing the growth at maturity of the pubic hair that conceals the genitals. The step that remained to be taken lay in the making the threads adhere to one another while on the body they stick into the skin and are only matted together.

Sarah Kofman comments: "By this artifice women mask the defectiveness of their genital organs. They can thus excite and charm men who would otherwise recoil in horror and who would be condemned to homosexuality." Weaving here obviously connotes a little more than a cultural achievement; it permits civilization itself.

Perhaps now I can present to you to take quite literally Richard Howard's comment on Barthes' "Death of the Author":

> When the homosexual is no longer the subject of which his book is the predicate then he eludes the scandal and the parade of before and after...; one betrays one's father in our oedipal tradition of parricide and piety.

"Woman is traditionally use - value for man, exchange value among men. Merchandise then, currency."

If the death of the author admits with writing of the homosexual, a reading of Barthes' choice of Penelope as figure of teacher can be given in terms of the three figures of woman or what I would call the three figures of the scientist's, philosopher's or writer's mother - put forth by Nietzsche and rewritten in Derrida's texts. First, there is the reactive position: the woman as castrated, the lack, the false, the truth of which he must teach her. Second, there is this position's negation: the woman as truth but mute. Freud's mother who allows herself to be seen but refuses to speak with him. In her refusal, he must theorize her truth. And there is a third position: the dionysiac, she who plays, refusing the economy of truth and falsity. She who is irreducibly bisexual, who puts on and off the fetish indefinitely, who is criminal rather than hysterical. It is this third 'woman' who is the figure of writing in Barthes' sense of the term and who is the figure of Derrida's deconstruction of phallocentrism - the project of the feminization of philosophy. But the deconstruction of the sovereign subject of philosophy, it can be noted (as Gayatri Spivak has done), is thus brought about by the double displacement of woman: first, in deconstruction's reinscription of her displacement in phallocentrism and second, in its critique of phallocentrism where philosophy as insemination by the author and father is replaced by writing as dissemination at the always intact hymen - the fold of meaning where no representation can be said to have begun or to originate but where, we might note, the virginity implied references the economy of legitimacy - virgin or mother/wife. This if it can be said that deconstruction longs for the mother rather than the father, the mother it longs for as Gayatri Spivak puts it, is one who can change her phallus indefinitely and has an outcast homosexual son

A brutal reading of man and man alone, now can be provisionally put forth. I am thinking of Luce Irigaray's commentary.

> For woman is traditionally use-value for man, exchange value among men. Merchandise then, currency. Why then consider masculine homosexuality as an exception, while in fact (commercial exchange among men) is the very basis of the general economy.

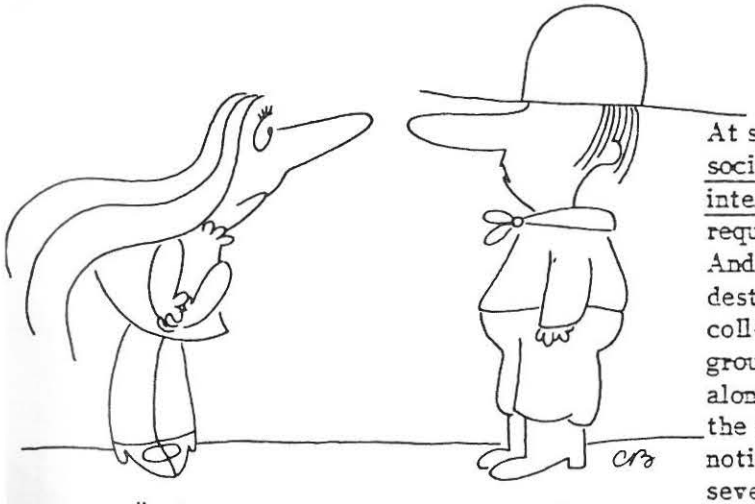
Thus Barthes' discomfort with teaching by figuring the teacher as mother and wife can be read: Penelope is no mother of criminality but instead weaves to maintain the lines of legitimacy and inheritance which she does maintain with the assistance of Athena.

But now I hope you can see that a certain history is collapsed by the economy of gender which allows for the degraded feminine figure as teacher. I can only briefly outline such a history. It is an interrelated history of the rise of the criminal homosexual and of course it is a history of woman, of her displacement on to what I would call the construction of the male-mother. This history Ivan Illich initiates with reference to the unprecedented institutionalization of maternity when in Europe in the eleventh century, the Church becomes Mater, Magistra and Domina (mother, authoritative teacher and sovereign) and at the end of the middle ages, when a non-hereditary elite, the clergy becomes the giver of pastoral counsel and personal service which can be linked as Foucault has done to therapeutic practice,

modern education and the corporate state apparatuses and then to the feminization of the teaching profession when women are finally allowed to be trained for the caring professions and which is only called the feminization of the teaching profession as the welfare state begins to collapse.

And so once again, Barthes is right to be worried about the authority of the teacher. And Irigaray answers her own question, why take homosexuality as an exception. In that, she answers, by short circuiting the commercial transactions, the criminal homosexual exposes what is really at stake in such dealings. When the penis is simply a means of pleasure among men alone, the exalted worth of the standard of value, the phallus, is devaluated. Yet, Barthes' concern is divided against itself - a theme of self-castration developed as a legend of writing as criminality.

And it is in this way that I want to suggest that the anxiety within constructivist thought over the charge of solipsism, over the authority of the teacher is made visible as an anxiety about the double displacement of the mother. Constructivism as a gesture to her stages itself as a self-castration (the castration of objectivity, essentialism, etc.), not taken here as a trivial gesture. But I am insisting on returning her to you to irritate constructivism into realizing the collapse of history, just at a time of the possibility of writing little histories, of the women or of the peoples of post colonial societies, for example. For it is precisely at the site of the possibility of those histories that the self-identity of bourgeois man is challenged.



But having learned well the valuable lessons of deconstruction, these histories can not now aim to produce a new privileged subject of history - the ex-colonized woman, the de-colonized native. For to use these terms paradoxically reinforces the contrast paradigms that have been so useful in projects of domination. It is at such a juncture of the possibility of those histories but the impossibility of a unified history that we come into contact with what is called late capitalism and the collapsing welfare state and with post modernism which itself releases heterogeneity without norm and where gender categories are already strained beyond recognition as sources of personal identity. And it is here, where Lacan's analysis and those related to it must seem out of date.

At such a juncture, we must come to recognize that the epistemological work of putting the self-identified subject under erasure (self-identity) along with an Hegelian notion of unified history (History) is on one hand, a matter of post modern culture catching up with late capitalism where as Frederic Jameson puts it:

> the scopic consumption of the veil has itself become the object of desire, (the post modern image) as some ultimate surface which has triumphantly succeeded in drawing that 'other thing', that 'something else', the objects behind it out onto a unified plane such that they shed their former solidarity and depth and become the very images rather than a representation of something else.

At such a juncture, society or the sociological as a representation of an intersubjective world implodes (it always required depths produced through veilings). And with that implosion comes the destruction of notions of community and collectivity which had so richly served us in grounding politics as these notions brought along with them traces of what we read as the unfolding of History. Without such notions, the usefulness of Marxism has been severely called into question. And so on the other hand, we can recognize that our own working at deconstruction is an investment in or is productive of late capitalism.

When the penis is simply a means of pleasure among men alone, the exalted worth of the standard of value, the phallus, is devaluated.

Recognizing our work (as constructivists and deconstructivists) as such need not be horrifying (to the extent that abandoning the notion of community is horrifying to some) nor need it be castrating (because of course, the oedipal narrative is dissipating; it can not be mapped on a unified plane). It might be understood, rather as coming into the cybernetic age where at least two perspectives rather than one always hold. On one hand, the investment in a notion of a unified plane makes easy a "final imposition of a grid of control on the planet... a star war apocalypse... the final appropriations of women's bodies in a masculinist orgy of war." On the other hand, there is the possibility of living "new bodily realities", unafraid of "joint kinship with animals and machines" or permanently partial identities and contradictory standpoints," (Donna Haraway).

I can only leave you with a figure. The figure of the teacher as minded - mother, where mind is neither his nor hers...

V

I have, of course, displaced the question of the teacher on to the question of politics. What politics is now possible (or needed)? I would suggest that it is to map the affinities of partial (taken in both senses of the word) identities. And in that political context, we might answer the question, who is the teacher? I can only leave you with a figure. The figure of the teacher as minded-mother, where mind is neither his nor hers but which to give a special reading to Warren McCullough's phrase, where mind is embodied and where that body is hers but is yet visibly and violently crisscrossed with histories of disciplining. But yet, which body is now not mute as it sings in multiple voices.

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Ink drawing by Dan Oliver

GULL DAYS

In the water
a dying pigeon floundered
and above
the rat of the skies
buzzed him
his gull shouts
hurting the pigeon's ears
and then came the final swoop
and the pigeon's eyes formed
the dull glaze
of gull days

THE DOWNING

As the late afternoon rain
carries into the magic of evening
I'm sure the imaginary wolves
up there by the power lines
are just as soaking wet
as the shivering mole on our doorstep

I press my face against the screen
to suck in water laden air
the breeze blows in a fine spray
that serves to moisten
the dehydrated bodies of insects
caught in the window
early last summer

CHUNK WHITE TUNA

You can play all day in a sandbox full of old snail shells
while just beyond the hedge
is the world's most viscious dog
and then you can sit on the crumbling cement steps
and eat the egg salad sandwiches made for you
when you look at the cactus pot
you stop to think
and decide that, probably, at least today,
you would have prefered
chunk white tuna.

THE GOOD MORNING POEM

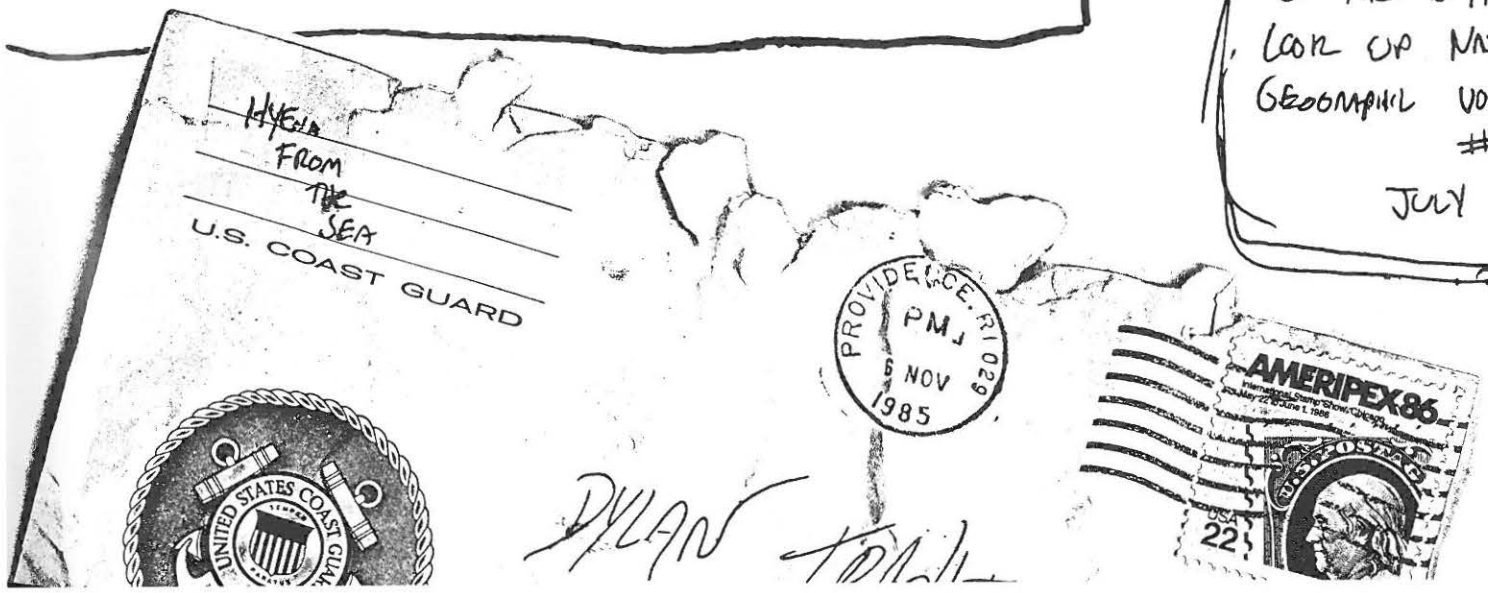
The hyena sat across the card table from me
in his right paw he held his silver baby spoon
in his left a cheap, smutty novel
his breakfast was in a bowl in front of him
young potatoes in warm milk with lots of pepper
he looks up from his book and grins uneasily
"You're my brother" he says "and I love you,
regardless of the circumstances"

TOTAL WAR

POWER FISH AND HIS FAMILY FOUND THEMSELVES ENGULFED IN THE HORRIBLE ENERGY OF THE TOTAL WAR

I AM INFLUENCED GREATLY BY THE HYENA AS A SYMBOL OF ALL THAT IS REAL IN THIS LIFE

FOR SOME GREAT PICTURES OF THE HYENA, LOOK UP NATIONAL GEOGRAPHIC VOL 134 #1 JULY 1968



October 31, 1946

Mr. George E. Forsythe
Physical Research Unit
Boeing Aircraft Company
Seattle 14, Washington

Dear Mr. Forsythe:

Since the termination of the war I have highly regretted the large percentage of scientific effort in this country which is being put into the preparation of the next calamity. I therefore am much gratified to find that my publication on "Extrapolation, Interpolation, and Filtering of Stationary Time Series" is no longer available to those who construct controlled missiles.

I can, of course, furnish you with no advice as to where to find them.

Sincerely yours,

Norbert Wiener

NW:rg

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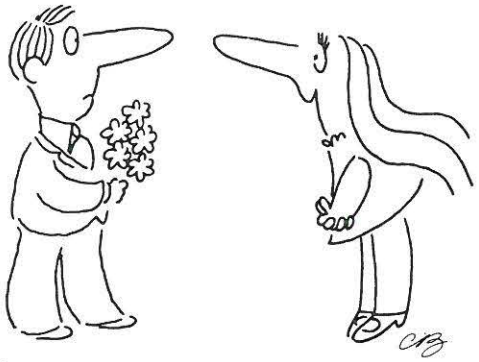

"Well, let's put it this way. Norbert, you're a guy and you're here."


PHILLIPS
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International
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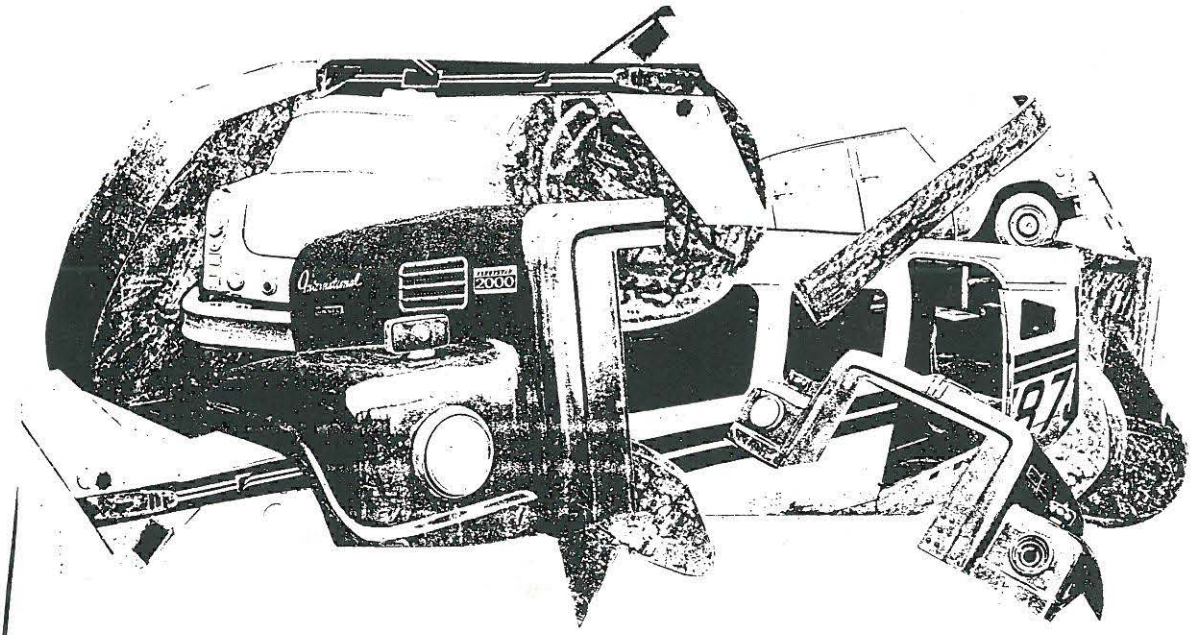
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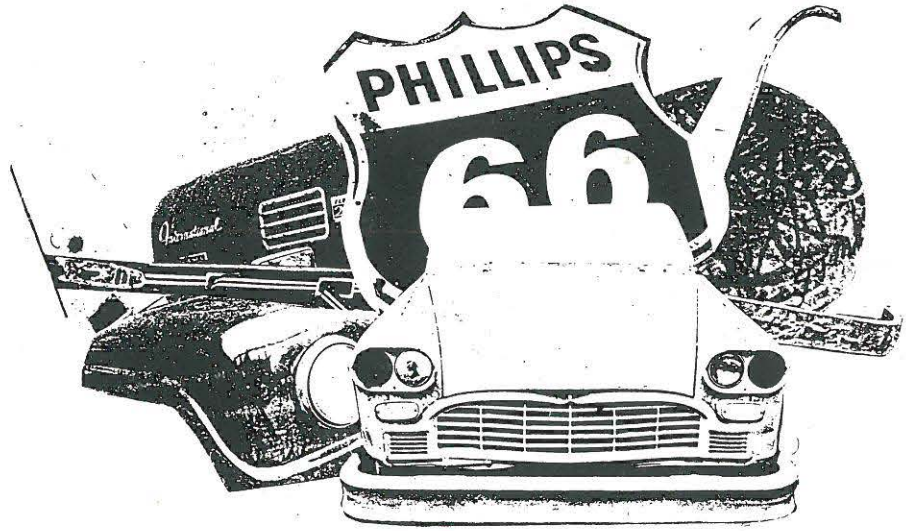
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