

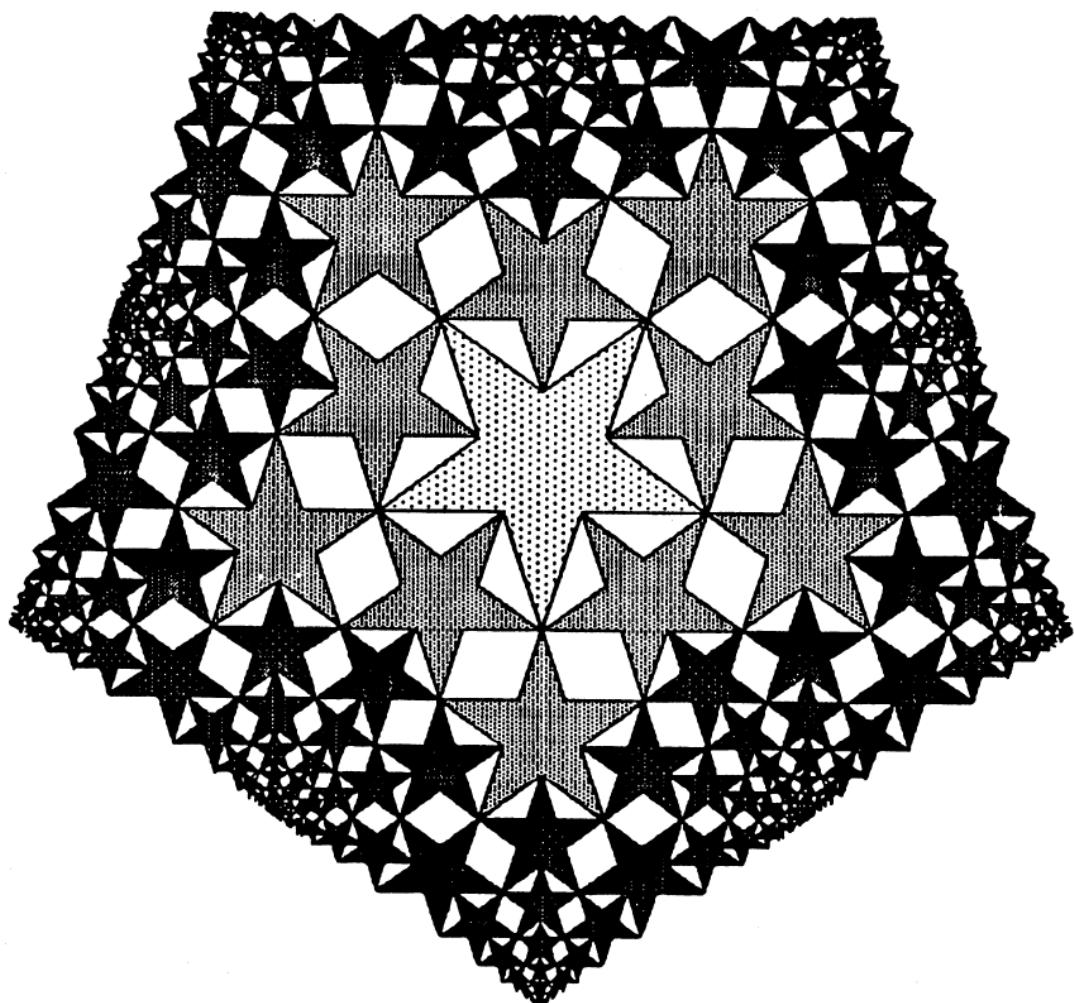
# ENTROPY

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## **Illustrations:**

Front cover: "Fractal Pentagram" by Tom W. Bell  
Back cover: "Pentagon Templates" by Tom W. Bell



**Extropy** is published quarterly by Tom W. Bell and Max T. O'Connor.

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Extropy #1 (Fall 1988): a brief overview of extropian philosophy and an introduction to some of the topics we plan to address: AI, Intelligence Increase Technologies, Immortalism, Nanotechnology, Spontaneous Orders, Psychochemical, Extropic Psychology, (A)morality, Mindfucking, Space Colonization, Libertarian Economics and Politics, Memetics, and Aesthetics; "Morality or Reality," by Max T. O'Connor. Available for \$1.50.

Extropy #2 (Winter 1989): "Review of *Mind Children*," by Max T. O'Connor; "Darwin's Difficulty," by H. Keith Henson and Arel Lucas; "A Truly Instant Breakfast," by Steven B. Harris; "Wisdomism," by Tom W. Bell; "Nanotechnology News," by Max T. O'Connor; "Weirdness Watch," by Mark E. Potts. Available for \$1.50.

Extropy #3 (Spring 1989): "Love as a Contractual Relation," by Tom W. Bell; "Love as a Sharing of Values," by Max T. O'Connor; "Agapeic Love," by Rob Michels; "Sexual Information," by Tom W. Bell; "Psychedelics and Mind Expansion," by Max T. O'Connor. Available for \$1.50. (This issue is currently sold out, but we'll reprint it. Please be patient.)

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## **EDITORIAL**

### **Pomp and Mitigating Circumstances**

Welcome to Extropy #4! This issue marks our first full year of publication. Max and I would like to thank you, our readers, for making it such a successful one. From a few subscriptions among our closest friends, Extropy's circulation has grown to well over 50 readers world-wide. Your support, contributions, and feedback have renewed our confidence in human intelligence. With your help we've managed to

disseminate a huge number of extropic memes, infecting minds the world over with a comprehensive and optimistic vision of the world to come. Thank you!

Many of you who have been with us from the start will find that the time has come to renew your subscriptions. Hence the time has come for me to plead that you do so. Please help us to continue our struggle against the deathly forces of entropy. Though we've accomplished a great deal in the last year, we've still got a long way to go. Don't give up now!

With that plea in mind, it's time to announce an increase in Extropy's

subscription rates. Max and I expected to lose money on Extropy from the start, and sure enough we have. When we had only 10 subscribers we could afford to lose 50¢ a copy. Now that both the number of pages and circulation of Extropy has grown, however, we find that its expenses have become somewhat too burdensome. To cover the costs of printing and mailing Extropy, then, we're increasing our North American subscription rates from \$6/year to \$8/year. Overseas subscriptions will remain at \$10/year. This brings Extropy's price up to that of comparable small press publications. Please let us know if this increase prevents you from resubscribing. We'll be more than willing to strike a deal to keep your readership. We're open to magazine or ad swaps for payment, too. And, as always, we offer a free issue to the author of each of our articles. Which leads me to repeat:

*Please indulge your urges to send us material on any extropian topic. We welcome articles on the following subjects, among others: artificial intelligence; cognitive science and neuroscience advances and possibilities; intelligence increase technologies; life extension, cryonics; biostasis, and immortalism in general; nanotechnology; hypermedia; spontaneous orders; space colonization; libertarian economics and politics; reviews of science fiction; intelligent use of psychochemicals; extropian self-improvement psychology; mindfucking and weirdness; extropic moral and amoral theories; exciting developments in science and technology; memetics; and aesthetics.*

This issue of Extropy brings some improvements. To pack in more text, we're trying a smaller, easier to read

typeface and double columns. Due to popular demand, we now offer back issues. See the inside of the front cover for a description of past issues and their prices. We're also introducing advertising. Rates are listed near the info on back issues.

## **This Issue: "Have The Courage to Think!"**

I'm pleased to report that at least one of our readers found parts of the last issue of Extropy "in bad taste." That's a good sign! We aim to entertain, and subversive articles are so much more interesting than proper ones! More importantly, it means that we're breaking some new ground, pushing the envelope of "acceptable" ideas. Extropy is vaccine for future shock, and sometimes the inoculations sting a little. You just have to grit your teeth and analyze that data. Don't be a conceptual coward. Have the courage to THINK!

But if you thought last issue's articles on love, sex, and drugs shook up your entrenched beliefs, prepare yourself for a *major* mindfuck. In this issue, the prolific and ever-riské Max O'Connor offers us another of his eye-opening articles: "In Praise of the Devil." I must admit that I hesitated before publishing this article. Like many of you, I was raised in a religious environment. After learning to think for myself, though, I cast aside religion as an irrational means of coping with reality. Or so I thought. Max's article really shook me up, though. It helped me to realize that I hadn't completely freed myself of my childhood training. That's mindfucking at its best: breaking the

chains of entropic conceptual structures. So I not only forced myself to print it, I also drew the pentagram on the front cover in its honor. (For much the same reason, I suggest desecrating your favorite flag.)

If you're not yet ready Max's mental workout, warm up with some of this issue's gentler bits. Try Extropy's "Forum," where Jim Stramel and I debate whether or not a man has to club a woman and have an orgasm to get her pregnant.

Want to indulge in a left-hemisphere power-trip? Check out "Efficient Aesthetics" where I explain how to calculate the numerical value to beauty.

"How do you feel about computers? I think they suck", says Simon D. Levy in his article "Neurocomputing: Why Computers Don't Think Like Humans, and How They Might." Simon, a graduate student of linguistics at the University of Connecticut, offers us an insider's view of current research in neural networks, and touches upon its philosophical implications. (Nice article, though it looks like Simon and I disagree about the merits of simplification.)

"What's Wrong with Death?" Surprisingly, a lot of people don't know! Max sets them straight in this fantastically pro-life article.

Mark Potts returns in this issue with an insightful review of F.M.-2030's *Are You a Transhuman?* Max backs him up with another look at this highly extropic book.

Read about the future of romantic love in "Why Monogamy?" where I review the justifications for limiting yourself to only one lover at a time.

Is Max a moralist after all? Find out in his "Postscript to 'Morality or

Reality,'" where he ties up the loose ends left over from his earlier article praising amorality.

Last but not least, Max offers us a long-promised summary of recent extropian technological advances in "Intelligence at Work: Advances in Science."

## A Word About Memes

Because this issue of Extropy makes several references to "memes", we thought it would be a good idea to repeat that memes are ideas that can replicate and evolve. As Richard Dawkins says in his fascinating book, *The Selfish Gene* (Oxford University Press, 1976), "examples of memes are tunes, ideas, catch-phrases, clothes fashions, ways of making pots or of building arches. Just as genes spread themselves by leaping from body to body via sperms or eggs, so memes propagate themselves in the meme pool by leaping from brain to brain via a process which, in the broad sense, can be called imitation."

The concept of memes is itself a meme, one which has fortunately infected us. Memetics offers us insight into how ideas (like extropism) spread and change. We hope to help you catch the meme bug, too.

## Thanks

Extropy would like to thank Mark Potts for sending tapes of the FM-2030 interview, and Kurt Schodel for the many clippings on technological advances.

Tom W. Bell



# Forum



Dear Extropy,

In "Sexual Information" (Extropy 3, Spring 1989) Tom Bell correctly affirms that "orgasms feel great because we've been naturally selected to enjoy them. Animals wired up to enjoy sex tend to engage in more sex than animals that find sex unpleasant, and animals that engage in more sex have more babies" (p. 22). Some three paragraphs later Bell notes that orgasms are neither necessary nor sufficient for reproduction: "you can have plenty of babies without having any orgasms. Likewise you can have plenty of orgasms without having any babies. . . ."

The latter is certainly true (thank goodness!), but the former applies only to females, as (perhaps) is indicated by his footnote (#5). In the note, Bell wonders "why, on the average, human females orgasm relatively infrequently relative to males . . ." (p. 23). "Perhaps," he continues, "it's because it's much more difficult for the male to reproduce without orgasm." Indeed, I can imagine few things more difficult!

But the "difficulty" of (male) reproduction without orgasm is a red herring, as perhaps Bell himself comes to realize. For he gets somewhat closer to the underlying truth when he says in next sentence that "due to their generally greater strength, males have tended to initiate and control sexual encounters. Perhaps this has made the incentives of orgasm pay off more for males' genes;

because males could force sex on females, it is primarily the former that have been selected to enjoy sex." Granted, males often forced (and, sadly, sometimes still do force) sex on females. But this is not due to their greater strength; it is due to their evolutionarily selected greater sex drive (and lack of refinement): their strength merely facilitates the expression of that drive in reproductive acts.

So why should males have developed inflated sex drives? Because evolution requires that we "go forth and multiply." What we need to recognize is that males and females obviously go about this in quite different ways. Before we became 'civilized', males had very little investment in the reproductive process after insemination. The goal (at least from the standpoint of the species) was to impregnate as many females as possible to facilitate the preservation of his genetic information. Because he had little investment in, or responsibility for, the development, birth, and rearing of young he needn't be particularly choosy about his mates. Nor was there any particular need to restrain his robust sexual urges.

Exactly the opposite is true of females: they have an enormous investment in the reproductive process. Not only do they have to bear the costs of gestation, they must suckle their offspring for many months, and provide (sometimes by themselves) extensive supervision and training for years (as we all know, humans have one of the

longest periods of infant dependency). Moreover, a female has only a limited number of reproductive resources. Assuming female fertility runs from age 13 to 40, and 13 ovulations per year (and assuming only one zygote per insemination will become viable), she will produce at most 351 zygotes. Of course, she can't actually conceive every month; at her most prolific then (and if everything goes perfectly, and she doesn't drop from exhaustion!), she can bear at most 36 children. Males, on the other hand, do not face such limitations. They are constantly fertile and could (if they could find willing females) father hundred, even thousands of children.

Obviously, the female's investment and risk is enormous -- this is no time to be screwing around. Because of this investment she must be very selective about her mates; eggs and reproductive energies are too precious to waste on inferior suitors. She will attempt to select not only those who are genetically superior, but also those from whom she can extract some kind of commitment to child-rearing (the birth of monogamy?). It would be counterproductive, and unnecessary, for females to be as sexually charged as are males. This does not mean that males enjoy sex more than females; it's just that nature has made it easier for males to reach orgasm and its attendant pleasures, again to facilitate the transmission of his genetic information.

Two closing thoughts: First, since the female orgasm does seem to play an important role in successful fertilization, it would be interesting to know whether females' ability to achieve (vaginal) orgasm varies with ovulation cycle. I would not be surprised if there were such a correlation, though I know of

no research on this topic (perhaps someone out there does). If none exists, I would -- in the interests of science -- be happy to volunteer my services as a research subject.

Second, none of the various stimulating articles on Love (same issue) touched on the connection between Love (whatever that is) and the male/female reproductive functions discussed above. It has been my view for many years that our understanding of our own romantic gyrations (or at least the gyrations of heterosexuals) can be greatly enhanced by giving the evolutionary biological facts their due.

Keep up the good work!

Extropically yours,

Jim Stramel  
Graduate Student,  
Philosophy, USC

Dear Jim,

Thanks for your comments. You've fortuitously raised a number of points that I address in this issue's "Why Monogamy?" There are some others, though, that I'd like to address here.

You seem to have studied "Sexual Information" closely, so it seems odd that you assert that male humans cannot impregnate women without orgasming. As I explained on page 23 of my article, "[O]rgasms are neither necessary nor sufficient for reproduction. A lot of sexually repressed women become mothers, and at least a few men have been unpleasantly surprised to find that the preseminal fluid they emit prior to ejaculating carries sperm. (That's why even well-timed *coitus interruptus*

makes for a poor birth-control technique; it fails about 20-25 percent of the time.)"

Or perhaps you read the figures but doubted their veracity. If so, I suggest that you check page 423 of Lloyd Saxton's The Individual, Marriage, and the Family (Belmont, California: Wadsworth Publishing Company, 1980), or that you just ask any family planning counselor.

I'm pleased to report that we may have both been wrong about men's use of force in mating -- if, that is, we can draw any lessons from the mating behavior of other primates. Adult male baboons seem designed to fight, having muscular bodies and long, sharp canine teeth. But Shirley C. Strum of U.C.S.D.

has discovered that contrary to traditional models of primate behavior male baboons depend more on friendship than on force to attract female mates. In her 5-year study of the reproductive behavior of wild baboons, Strum found that the males most likely to mate with sexually receptive females were those which had maintained long-term friendships with their prospective mates. Such friendships preceded mating 89 percent of the time. Aggressive males succeed in drawing a receptive female away from another male only 25 percent of the time (Bruce Bower, "Sex and friendship among baboons," Science 135, no. 16 (April 22, 1989): 251).

Tom W. Bell



## IN PRAISE OF THE DEVIL

By Max O'Connor

*"There is on earth among all dangers no more dangerous thing than a richly endowed and adroit reason, especially if she enters into spiritual matters which concern the soul and God. For it is more possible to teach an ass to read than to blind such a reason and lead it right; for reason must be deluded, blinded, and destroyed." "Faith must trample underfoot all reason, sense, and understanding, and whatever it sees it must put out of sight, and wish to know nothing but the word of God."* Martin Luther

*"And the Son of God died; it is by all means to be believed, because it is absurd. And He was buried and rose again; the fact is certain because it is impossible." "After Jesus Christ we have no need of speculation, after the Gospel no need of research. When we come to believe, we have no desire to believe anything else; for we begin by believing that there is nothing else which we have to believe..." Tertullian*

This article is written in praise of Satan, Lucifer, the Devil, or whatever you want to call him. I must first make it clear that I am not here claiming ontological status for the Devil; that is, I am not claiming that he exists in the sense that you and I exist. I am quite serious on a symbolic level in what I write but my statements praising the Devil and attacking Christianity, God, and Jesus are not to be taken as implying the real existence of any of these supposed beings. The only one of these that I think one could reasonably believe actually existed is Jesus. It seems probable that there was a human being who was a political and religious leader at the time though it seems to me to be absurd to believe claims about his origin or divine nature. My praise of the Devil is not *entirely* (though it is mostly) serious, and it is to be taken on a purely symbolic level. My goal is to bring out the values and perspective of the Christian tradition and to demonstrate how it is fundamentally at odds with the values held by myself and all extropians and with the perspective that we share.

The Devil - Lucifer - is a force for good (where I define 'good' simply as that which I value, not wanting to imply any universal validity or necessity to the orientation). 'Lucifer' means 'light-bringer' and this should begin to clue us in to his symbolic importance. The story is that God threw Lucifer out of Heaven because Lucifer had started to question God and was spreading dissension among the angels. We must remember that this story is told from the point of view of the Godists (if I may coin a term) and not from that of the Luciferians (I will use this term to distinguish us from the official Satanists with whom I have

fundamental differences). The truth may just as easily be that Lucifer *resigned* from heaven.

God, being the well-documented sadist that he is, no doubt wanted to keep Lucifer around so that he could punish him and try to get him back under his (God's) power. Probably what really happened was that Lucifer came to hate God's kingdom, his sadism, his demand for slavish conformity and obedience, his psychotic rage at any display of independent thinking and behavior. Lucifer realized that he could never fully think for himself and could certainly not act on his independent thinking so long as he was under God's control. Therefore he left Heaven, that terrible spiritual-State ruled by the cosmic sadist Jehovah, and was accompanied by some of the angels who had had enough courage to question God's authority and his value-perspective.

Lucifer is the embodiment of reason, of intelligence, of critical thought. He stands against the dogma of God and all other dogmas. He stands for the exploration of new ideas and new perspectives in the pursuit of truth.

God demands that we believe everything that he tells us, and that we do everything that he says without questioning. Destroy a tribe including the women, children and animals down to last one? (Joshua 6.21). Why of course. Wait a minute, this doesn't seem very nice. SILENCE FOOL. HOW DARE YOU QUESTION ME. I AM GOD AND YOU MUST OBEY ME WITHOUT QUESTIONING. ACCEPT WHAT I SAY ON FAITH. BURN THOSE WHO DARE QUESTION MY WORD. DESTROY THEIR BOOKS. SHUT DOWN THEIR SCHOOLS. TELL THEM THAT DISOBEDIENCE MEANS THAT THEY WILL BURN FOREVER AND EVER, IN

UNIMAGINABLE AGONY FOR ALL ETERNITY, AND REMEMBER THAT YOU WILL SUFFER THE SAME UNLESS YOU GO OUT AND TELL THEM THIS. Yes Sir, God Sir, whatever you say. See, here I am burning their books, pulling out their nails, torturing them for questioning Church dogma, banning the use of anaesthetic in child-bearing (since the pain is their just punishment for the acts of Adam and Eve). Help! I thought an improper thought! Help me to blind my mind God, help me to not see what my reason tells me. Let me repress thoughts of sexual desire, doubts about you and your orders, feelings of tolerance.



## Independent thinkers do not make good slaves.



They call Lucifer the Prince of Lies. A lie is defined by the Christian as anything which contradicts the Word of God - as told to us by the Bible and God's representatives on Earth. If we are accept this definition of a lie then we should praise lies. A "lie" is then a questioning of blind dogma. The "lies" of Lucifer are attacks on irrational beliefs, beliefs based on fear and conformity to authority. Of course we should not call these lies. They are temptations to think for ourselves, a call for independent thought, a plea for taking responsibility for our own thinking and our own lives. Praise Lucifer! Praise the pursuit of truth through rationality. God was right to tell us to not worship false idols, but he refrained from telling us that all idols

are false, and that all worship is dangerous. Even our praise of Lucifer must not be worship of an idol, but rather an expression of our agreement with his value-orientation and his perspective.

God and his Godists hate Lucifer's call for rationality. Critical thinking digs at the very roots of God's and their power over our minds. Independent thinkers do not make good slaves. Lucifer is the Prince of Lies because he is an expert at helping us to be rational. He shows us how to use our intelligence and how to take responsibility for ourselves. We should emulate him in encouraging this trend in ourselves and in others. He needs help since he is working against the laziness and neuroticism of many humans. It's so much easier to just not try to think, to sit back and let other people tell you what you should do, what to believe, and where to give your money. Why, if I had to think for myself I would have to face the fact that I might be wrong. Horrors! I would have to think carefully about my life and the reality that I live in carefully and that would take a lot of work. No, it's much easier to have faith, to accept, to believe, to obey.

God also hates us to enjoy ourselves. If we let ourselves experience too much pleasure then we might lose interest in obeying him. We might start running our own lives to bring us positive rewards rather than directing ourselves to avoid his wrath. We might become focussed on pursuing the positive instead of avoiding the negative. That would result in the downfall, of religious and state authority, so God has to stamp out such tendencies. He hates Lucifer who keeps turning up and tempting us to have a good time, to enjoy our lives. Adam and Eve's sin was

to eat of the fruit of the tree of knowledge. They dared to disobey a direct order which God expected them to obey without question, blindly. They acquired reason and intelligence, and an ability to decide for themselves the values that they would pursue. Ever since then humans have been uppity - always giving God trouble. Dammit, even some of the Catholics are questioning the Pope's infallibility. Well that's just tough God; some of us are going to do our best to see that humans continue to become even more difficult to handle - both by you and by your human followers on Earth - the religious authorities and the Statists.

God likes altruism, altruism understood as true self-sacrifice and not as giving up a minor value to achieve a more important one (which is just one aspect of rationality). If God can just get us all to be good altruists then we will be so much easier to control. Altruists do what they are told without complaint; a complaint would be based in self-interest; it would be a claim to live one's own life without having to direct it towards the lives of others or towards the interests of God or "the State". Lucifer perseveres in trying to point out to us that we have no reason to accept altruism. We can choose our values for ourselves, just as we can think for ourselves. Lucifer himself values the pursuit of happiness, knowledge, and new experiences. Most of all he values self-responsibility and independence even if that means that some people will not choose to value the things that he values. The extropians among us who share his perspectives and value-orientation should help him in his work.

God had a clever and nasty strategy to promote altruism and therefore obedience. He tries to get us to

believe in Original Sin. He wants us to believe that we born sinful, that we were evil and needed saving even before we had done anything. We need God and his agents to save us from Sin otherwise we will burn FOREVER and we will miss out on an infinite and perfect reward (though he never tells us just what this is). Our path to salvation lies in service to God, selfless self-sacrificial service to God and his dogma. Without the idea of original sin we might not be so careful to obey God since we might figure that we were living pretty well and would go to heaven anyway (foolishly failing to inquire what heaven is like). Fortunately for God, Original Sin guarantees that we will always feel under threat. We will always be unclean and in danger of suffering hellfire.



**If God can just get us  
all to be good altruists  
then we will be so much  
easier to control.**



To make quite sure that our personal responsibility is destroyed, and that we put ourselves in God's hands for him to mould us as he wishes, God and his moronic minions repeatedly tells us that Jesus Christ is the Way and that he died for our sins. Redemption lies through faith and obedience. Notice what happens when Christ supposedly died for our sins. His act brought about our possibility of salvation. What I want to know is: how can someone else's act excuse me from

anything? I am responsible for my own actions. Nothing that I do can take away the fact that someone else acting in a certain way, and nothing that they can do can absolve me of my own responsibility. Original Sin and salvation by Christ are both deeply offensive ideas to me and to all extropians who value individual responsibility.

In ending this discussion, I want to remind you that you are *all* Popes. You are all your own highest authority. You are the source of your action. You choose

your values - whether you do so actively or by default. You choose what to believe, how strongly to believe, and what you will take as disconfirming evidence. No one has authority over you - you are your own authority, your own value-chooser, your own thinker. Join me, join Lucifer, and join Extropy in fighting God and his entropic forces with our minds, our wills, and our courage. God's army is strong, but they are backed by ignorance, fear, and cowardice. Reality is fundamentally on our side. Forward  
i n t o                      t h e                      l i g h t !

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## **Neurocomputing:** *Why Computers Don't Think Like Humans, and How They Might*

by Simon D. Levy

How do you feel about computers? I think they suck. I'm not talking about the idea of *having* computers do the things that people can't or won't do, such as storing huge amounts of data or performing millions of calculations in a second. I'm talking about the actual machines, from the pocket calculators that are practically free these days, to the multi-million dollar supercomputers. They suck.

"But," you object, "Computers are incredible! Today microchips the size of your fingernail can perform

calculations that a few decades ago would have taken a warehouse full of circuits." Sorry, I'm not convinced. If something is the size of a warehouse and sucks, and you shrink it to the size of a fingernail, it still sucks, at least in my book.

What I'm getting at is that the fundamental abilities of computers have not changed since the first relay-based machines were built in the 1940's. The basic architecture of computers -- a storage area, a processor, and an input/output device -- has seen very few qualitative improvements. Using a

computer is easier now than it ever has been, but the number of people who can actually *program* a computer represents a very, very small percentage of the population. Most people I know who have tried to learn the skill end up frustrated and angry. Why is this?

A lot of answers have been given for this question, but I think that the essential reason why computers are so difficult is that they are (1) denotative, (2) deterministic, and (3) serial. They are *denotative* because they can only use a name to point to a single object. For example, think of all the images that the word "man" conjures up in your mind when you hear it. In a very real way, there is no definable limit to the amount of information that you associate with this (and perhaps all other) words in your language. In a computer language, on the other hand, every name you assign to an object (a number, a list of numbers, a list of properties, a device to be controlled, *et al.*) can refer *only* to that object, and no other. Of course, if you are writing a program to fire a missile, you don't want your computer to be making any guesses as to what you are telling it to do. On the other hand, imagine trying to hold a conversation with a person for whom every word refers to a single, rigidly defined real-world object or class of objects. You tell him to answer the telephone. He happens to have grown up on the other side of the country, and for him, "the telephone" is a certain device located in his home, thousands of miles away. He can't associate the telephone in your house with the general *notion* of what a telephone is (a class of objects with the same function), because his language is purely denotative. You get the idea.

Computers are *deterministic* in that, given the same input and programming, they will always produce the same output. Again, this feature is desirable at a certain level of organization, because you want to know what your machine is going to do based on what you tell it to do. In my estimation, though, determinism is the main reason that learning to use or program a computer can be such a nerve-wracking experience. One little error in a program, a single misspelling, can result in a horrifying heap of garbage with no resemblance to what you wanted the machine to do. The analogy here does not even need to be made with something as complex as a human being; imagine, for instance, a car that would explode if you gave it regular gasoline instead of unleaded.

Most computers are *serial* devices: They deal with things one step at a time. For example, in multiplying a large list of numbers by a single number, the average computer will loop through the entire list, multiplying each number in the list by the first number, in succession. This strategy fails to take advantage of the distributive property of multiplication over addition, one of the fundamental properties of mathematics. As far as the computer is concerned, the single number may as well be a different number each time it is multiplied with a number in the list. This problem, named the von Neuman Bottleneck (after one of the founders of computer science), may not seem to bear much relation to the problem of getting computers to think like people, but many researchers have come to believe that it is the serial nature of present-day computers that causes them to be stupidly denotative and

stupidly deterministic, so unlike human beings.

These researchers, working in a field known as parallel distributed processing, neural networks, neurocomputing, and a few other buzzwords that escape me at the moment, believe that the answer to the problem lies in the way that computers represent and store information. As complicated and mysterious as this field has come to seem, its fundamental assumption can be summed up as follows: rather than representing an idea or behavior *locally*, in a single memory address or addresses, represent the idea or behavior *globally*, as a *pattern of activity* in a network of simple units. Instead of representing the word "man" or "telephone" as a single object or list of properties at a specific location in memory, a neural computer will respond to the word "man" with a pattern of electrical activity over a net of symbolic units. These units, like the neurons that make up the animal brain, are called *sub-symbolic* because they themselves do not represent anything interesting; rather, the way they are connected determines what they are "thinking" about.

There is a great deal of justification, both empirical and pragmatic, for building computers this way. Empirically, we know that the processors in present-day computers work at orders of magnitude faster than human neurons. The inability of these computers to perform even the simplest human (and animal) tasks points to the conclusion that the architecture (setup) of the processing units, not their speed, is what counts. The parallelism of the neural connections in the brain is well known. Each neuron can connect to a large number of other neurons. The total

number of these connections in the human brain has been calculated as ten to some ridiculous power. Clearly, biology has chosen connections over speed in setting up the brain.

Pragmatically, neural computers are capable of overcoming many of the problems associated with denotation and determinism. Because it represents a concept or pattern in a *distributed way*, a neural network is less likely to be upset by variation in individual tokens of that concept or pattern. For example, say we present our neural network with a picture of a man (I won't get into just how to do this; that's another article, book, and career in itself). Anyway, the man in the picture happens to have a beard. We tell our network "This is a man." After we "train" it in this manner, the network has stored the representations of a man as a pattern of connections over its individual neurons. Some of these connections represent the idea of "having a beard." To test our network, we present it with another picture, this time a picture of a man without a beard. Because so much of the "non-beard" part of the image of a man is activated in the network when it sees the second picture, the network is able to recognize the second picture as that of a man. Instead of isolating beardedness in a certain location in the computer and telling the computer that beardedness is optional for manhood, we have allowed the computer to make its own judgements about what is or isn't important for recognizing a man. In this way, the network can be said to overcome some of the problems of *determinism* mentioned earlier. Because the programmer has not actively isolated any feature as crucial to the man/not-man decision, it is unlikely that any particular variation in the

pictures will have a catastrophic effect of the decision. A single "mistake" won't result in garbage.

Of course, we want the network to pick out the essential features of what a man looks like, and we can do this by training it with many pictures. After a while, the network will learn on its own what these features are, just as a child does not have to be told "This is a man; note the optional beard, usual two legs, two arms, deep voice, . . . "

The distribution of computation in a neural net has another useful property worth mentioning, that of *robustness*, or *graceful degradation*. Destroying a connection or connections won't result in complete chaos, unless the damage is extensive. Here, again, biology provides a parallel. Our brain cells are killed off by various agents (alcohol is the only one I can think of right now, ha ha), but we generally suffer no long-term memory loss or retardation from losing them. The loss of these abilities that comes from aging, severe as it may be, is not sudden; it is usually difficult to pinpoint the time at which a certain faculty was lost completely. Once more, the likeliest explanation for these observations is that the function of the brain is not isolated in a particular cell or set of cells, but in the zillions of connections between the cells. Breaking a few of these connections won't cause too much damage.

It is true that certain areas of the brain *seem* to be specialized for certain functions -- the left brain/right brain distinction is the most commonly mentioned distinction of this sort. My response to this is that (1) the isolation of cognitive areas in the brain is so ill-

understood that anyone raising this objection to neural networks is standing on shaky ground, and (2) even if someone someday proves that a single area is responsible for a certain function, we will simply create a specialized neural net for this "sub-brain," and not worry about it any further.

Finally, it is worth mentioning that the neural networks issue has some profound implications for the mind/brain problem, the problem of the "soul," and for epistemological problems in general. If the brain really is a neural network, then the mind is simply (incredibly!) the connections between the neurons. To me, this formulation has the exact flavor of the abstract/concrete distinction that is at the core of the mind/brain problem, the distinction that philosophers have been agonizing over for a long, long time. If you're looking for a reason why this article has been published in Extropy, that's it.

I hope that I've conveyed some of the basic ideas of neurocomputing, and some of the excitement of the people who work in this field. I won't tell you that what I've said is a vast oversimplification, because that kind of caveat is a lot of crap -- either you get an idea across or you don't; the rest, as the Hebrew sage Hillel said, is just detail. The detail is fascinating, though, and I plan to continue talking about neural networks in Extropy's next issue. I'd like to review Marvin Minsky's classic Perceptions, the book that was supposed to have put an end to neurocomputing around twenty years ago. Stay tuned.

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# Why Monogamy?

By Tom W. Bell

In the last *Extropy* I described love as a contractual relation.<sup>1</sup> As something of a footnote, I'd now like to follow up with a word about monogamy.

Nothing in "Love as a Contractual Relation" limits love contracts to only two parties. Three or more people could conceivably enter into a love relation -- consider polygamy (marriages between multiple husbands or wives). Less than two people can love, too. When an individual sacrifices immediate pleasures for future gains, his present self and his potential self enter into a contractual relation of sorts. What love relation could be more intimate? Self-love is love, too.

Nevertheless, I wrote "Love as a Contractual Relation" with monogamy in mind. My own experiments in love have focused on love relations between only two parties. Keeping love to two limits the number of variables -- keeps the data tidy! Experimental elegance was not, however, my main motivation for preferring monogamy. Something else, something stronger and deeper, draws me to only one lover at a time.

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<sup>1</sup> Tom W. Bell, "Love as a Contractual Relation," *Extropy* 3 (Spring 1989): 9-13.

I share this trait with most other humans; monogamy is the commonest sort of bond in present human society. Though about 75% of the world's cultures *allow* polygamy,<sup>1</sup> it remains the exception rather than the rule even in those societies.<sup>2</sup> Why is monogamy so popular?

## Biological Reasons for Monogamy

I've sought a justification for monogamy in the animal kingdom at large, but it seems to be an almost uniquely human trait. Disneyesque fantasies aside, only 3% of non-human mammals practice monogamy. It's seen in even fewer of the fishes, and virtually none of the other animals. So monogamy

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<sup>1</sup> Among polygamous societies, the vast majority practice polygyny (multiple wives). Less than 1% favor polyandry (multiple husbands). Perhaps this is because men have a stronger genetic drive toward promiscuity, for the reasons outlined below. Lloyd Saxton, *The Individual, Marriage, and the Family* (Belmont, California: Wadsworth Publishing Company, 1980), 235.

<sup>2</sup> Chris Catton and James Gray, *Sex In Nature* (Beckenham, England: Croom Helm Limited, 1985), 219.

*isn't* the relation of choice for most living things.

The birds, however, present an interesting exception. Over ninety percent of them take only one mate at a time. Birds are special among animals, however, because they have such high energy needs. Small hummingbirds consume two times their body weight of sweet nectar daily. Even relatively sedate songbirds eat a third of their weight in food each day. This makes raising baby birds tough. After feeding themselves, bird parents must warm, defend, and feed their chicks as well.

Luckily for female birds, male birds can help with all of these tasks. They can build the nest, brood the eggs, bring food, and frighten away predators. Thus a male bird serves his genes most efficiently by taking only one mate at a time and helping her to raise their offspring. Male birds have therefore evolved to do just that. Few other male animals can help their children as much, so males of other species have been naturally selected for promiscuity.<sup>1</sup> Perhaps the females of non-monogamous species would have it otherwise, but it takes two to tango. These considerations reveal a universal biological principle: monogamy covaries with the advantages it offers to the genes of both male and female of a species.

Does this principle apply to *Homo Sapiens*? Is monogamy to the advantage of our genes? It certainly was at one time. Though humans don't crave energy as much as birds do, the human infant's long gestation period and helpless childhood does make parenthood a heavy burden. Like birds, human males can help their

mates with childraising a great deal, too. Perhaps, then, humans have been naturally selected to prefer monogamy. It has probably served our genes long and well.

While our genetic heritage may explain our preferring monogamy, however, it doesn't *justify* it. We have freed ourselves of the constraints that may have once made monogamy necessary for successful parenthood. Technology has rendered both food and shelter relatively cheap. Unlike a female bird, a female human can now provide for her children without a man's help. The same is true of single fathers, as well. So while we may have been naturally selected to prefer monogamy, our intelligence has rendered our genetic programming obsolete.<sup>2</sup>

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**monogamy *isn't* the  
relation of choice for  
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Still, it may be argued, we cannot ignore our genetic programming. Like it or not, it affects us. When we choose what sort of life to live, we must consider what we can feel comfortable with. If only monogamy satisfies our deep-seated drives, then we may as well ignore the rational arguments for polygamy and settle into comfortable couplings.

This is only true, however, to the extent that we are willing to sacrifice

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<sup>1</sup>Ibid., 181.

<sup>2</sup>I refer, of course, to humans in the modern industrial world. In poorer cultures, successful parenthood may yet require the cooperation of two parents.

our rationality for our pleasure. One might take a heroic approach to love, eschewing easy comforts for logical possibilities. Though this approach may sound odd to those who pursue love solely for pleasure's sake, it isn't inconceivable that the love of rationality could lead one to prefer rational love.

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**Alone above all other animals, we have the power to rise above our inborn drives**

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More importantly, however, the argument that we should accept our genetic programming assumes that we are powerless to change it. But we humans need not be slaves to our genes. Alone among all other animals, we have the power to rise above our inborn drives, to place our individual interests above those of our genes. Through force of will, conditioning, and (eventually) genetic engineering, we can effectively negate our "monogamy genes", if such there be.

With this in mind, let's take a fresh look at monogamy. Suppose that you can overcome any genetic predisposition for monogamy. Or suppose that you're a mutant of sorts -- you lack the "monogamy gene." Have you still got any reason to prefer monogamy?

#### **Practical Reasons for Monogamy**

Well, there are still a couple of practical reasons in favor of monogamy. Firstly, you have to keep in mind that blatant polygamy can make life among monogamists somewhat difficult. So one

might stick to monogamy simply to enjoy the "benefits" of conformity (more aptly: to avoid the hardships of individualism). I sincerely hope that this argument doesn't carry too much weight among **Extropy's** readers! In any case, this consideration counts for less and less in our increasingly pluralistic culture.

Another practical consideration to keep in mind: sexually transmitted diseases. We shouldn't treat this advantage of monogamy too lightly -- AIDS makes it a life-or-death issue. Nevertheless, careful lovers can work around the dangers of STD's, and medical technology will someday eliminate them altogether.

#### **Psychological Reasons for Monogamy**

If Freud and his many followers are right, we may have psychological reasons to prefer monogamy over other forms of romantic relationships. As he would have it, we look for our parents in our lovers. To oversimplify (for how else can one represent the tangles of human psychology?), we seek to reenact with our current lovers the relationships we observed between our parents, symbolically becoming our mothers' fathers, or our fathers' mothers. Given that most of us have come from monogamous households, monogamy most fully satisfies our psychological needs.

Of course, this argument makes the psychological reasons for monogamy entirely contingent on one's upbringing. If you come from a non-monogamous household, then monogamy would *not* offer you the most psychologically satisfying sort of love relation. Once

**polygamy gained a foothold in a society, then, monogamy would fall from favor.**

More importantly, this argument faces the same objections that confronted the genetic argument for monogamy: our comfort with a particular form of relationship doesn't necessarily justify it. Rather than forever reliving the dramas of our childhoods, we may be better off freeing ourselves from our pasts. What would we see if we could look at our lovers with the clear eyes of an adult, instead of through the dim eyes of subconscious children? We *might* see that we'd lost one of our major reasons for favoring monogamy.

### **Information-Theoretic Reasons for Monogamy**

In "Sexual Information"<sup>1</sup> I suggested that we enjoy sex so much because it satisfies our lust for information. Perhaps the same holds true of monogamy. People are complex. It takes a long time and a lot of work to come to an understanding of those you love. Even once you get to that point, however, you can't rest easy. People change, and successful relationships must change along with them. Relating to someone fully is a lot like speaking a language fluently: you have to master the basics, keep up to date on its changes, and practice constantly. If we want to enjoy the full richness of a romantic relationship, then, we may have to restrict ourselves to only one romantic partner at a time, just as most of us speak only one language fluently.

Just as have the previous ones, however, this justification of monogamy

faces several objections. For one thing, we must note that some people speak many languages fluently. Why can't some people therefore enjoy several fully developed relationships, as well? This objection depends heavily on the analogy between relationships and languages, however, and it seems likely that people are more complex than languages. (Consider, as proof, that the power of speech is a subset on one's entire personality.) While a super-romantic capable of deeply understanding several lovers isn't beyond the realm of imagination, in actuality few people have the capacity to understand *themselves*, much less any one else.

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### **Why can't one have a single romantic love and several sexual partners?**

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Much to my disconcert, my own (presumably) monogamous love has offered another objection to the information-theoretic justification of monogamy: it assumes that love and sex cannot be separated. But why can't one have a single romantic love and several sexual partners? While your relationship with the former may demand a great deal of time and effort, your sexual flings would require more stamina than understanding. In all honesty, I can't think of a good retort to this beyond the observation that in practice not many romantic relationships allow such sexual freedom (do they, hon?).

Finally, to take a futuristic view of relationships, we must note that this

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<sup>1</sup>Tom W. Bell, "Sexual Information", *Extropy* 3 (Spring, 1989): 22-26.

defense of monogamy assumes that we must find it difficult to understand our fellow humans. But advancing technology may greatly increase our powers to communicate and process the data that we receive. If so, we may find it relatively easy to come to deep understandings of many people, thus allowing us to enter into rich relationships with more than one person at a time.

To conclude, we've reviewed the genetic, practical, psychological and information-theoretic reasons for favoring monogamous relationships. Each class of reasons has something to offer, yet none offers a conclusive justification for favoring monogamy over all alternative forms of love-relationships.

In some respects, this is an optimal result. The fact that there are good reasons both for and against monogamy means that we are free to choose our relationships as we see fit. There is no singularly "correct" form of love. This should lead us to value more fully the voluntary nature of our own love relationships, and to view those who participate in alternative relationships with greater tolerance.<sup>1</sup>

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<sup>1</sup> I would like to thank Donna Matias, Max O'Connor, and Jim Stramel for having joined me in thoughtful discussions of some of the issues covered in this article.

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## WHAT'S WRONG WITH DEATH?

By  
Max O'Connor

A central extropian value is the love of life and the opposition to death. Death is seen as an enemy which destroys personality, value, information (in the brain), and all possibility of further growth in personal knowledge, wisdom, power, and experience. This is very clear to me and to fellow immortalists, and yet most people go to great lengths to find arguments which show death to be good, or at least unobjectionable. I have come

across a variety of these arguments and the purpose of this article is to refute them. Though the discussion should really include reasons to find the prospect of immortality a thrilling one, that will have to wait for another time.

### Death and the relief of pain

Death is about the worst possible thing that could happen to you. Perhaps

we can construct fantasy situations which we would grant to be worse than death. If someone told me, and I knew beyond all doubt they were telling the truth, that I would be tortured relentlessly for 50 years and then completely destroyed with no chance for recovery, I might rationally choose to die now rather than in 50 years. But if I was to be tortured for awhile and then freed, or had even a reasonable possibility of being freed, I would prefer to live, especially given that I will have a chance at unending life thanks to future biomedical technology. Certainly in any remotely foreseeable circumstances, death would be something I would resist and resent. It's true that, given my human weakness, I might choose to die rather than suffer great and enduring pain. But this would not be because death was *better*, it would only be because I couldn't *bear* any more of the pain. This is not to say that I necessarily *would* choose continued life because, when that situation came about, my thinking could be clouded by pain and an inability to think of anything other than *make it stop!* Yet, if I expected this to occur, and I could do so, I would prevent myself from killing myself at that time (perhaps by persuading someone to stop me and to ignore whatever I said to them then, or by other means). If I was ignorant of cryonics and the possibility of later healthy revival, it might be rational for me to choose death over a protracted terminal illness; however; I know that "terminal illnesses" may not really be terminal, just temporary.

Some will object that the fact of my choosing death over painful experience shows that death is what I really prefer. They would say that I am now just imposing my present

preferences on those of my future self<sup>1</sup>. Tempting as this view may be initially, it seems to make no sense when the idea of preferences and "real wants" are understood in terms of the identity of the agent from which they are generated. If momentary urges are distinguished from the desires that are truly representative of you, then we should say that you can have reasons to do things which you don't, at that instant, want to do. 'Wants' are just action-tendencies; they are the objects towards which I feel my actions being pulled. But it may not be *me* pushing me to do these things, or to make these choices. Humans are not tightly connected unitary entities with no underlying complexity. My brain is composed of many sub-units, each programmed to perform a certain task, some of which are very specific, others more abstract. One of those sub-systems sometimes cuts in to make me want to eat, to drink, to sleep, to seek sexual gratification, to seek out companionship, and so on. For sound evolutionary reasons (sound from "evolution's" point of view) we have a powerful sub-system that cuts in when we feel pain and tells us to remove the source of the pain. If the pain is very bad the sub-system will urge us to stop the pain *whatever it takes*. In the case of choosing between instant death or a long-but-finite period of intense pain followed by normality, our anti-pain sub-system will try to blank out all other thought processes and all other considerations in order to stop the pain. Hence, it may not be possible for me or anyone in such a situation to do anything other than choose instant death if this is the only way we can see to stop the pain.

But the fact (if it is) that you *would* choose death over great pain does

no show ya you s ou . is a moral, rational or even metaphysical "should". The reasons you have to act are rooted in your identity as an agent, in what makes you who you are: that set of perspectives, values, attachments and commitments which constitute you. Those reasons for action do not necessarily coincide with the momentary desires which your subsystems impose on you. Your preferences are not those of "evolution". (I refer to evolution in quotation marks to warn against seeing it as an agent or a conscious process; evolution is the just what we describe as the process of variation and selection in the gene-pool.) So, in the instant-death-or-temporary-extreme-pain choice, an evolutionarily-chosen sub-system is forcing you to do something which you - the true, complete you - would not desire.

For those who don't believe that physical immortality (or vastly extended life) is a possibility, the rational trade-off between pain and longer life will be different. If you don't expect to live more than a few years after recovery, enduring the pain may have insufficient rewards to be worth it. The longer you expect or hope to be around to enjoy life, the more pain it is rational to be willing to endure. So I'm not arguing that it is *always* wrong to choose death; just that death, especially for the immortalist, is virtually always the worst thing, and that death may be the thing you have most reason to avoid even if you *currently* want it more than the painful alternative.

### Perspectives on death

When I say that, to me, death would be (virtually) always the worst evil, I do not mean "death" in the

abstract. I do not think that death is the ultimate evil for me just because death is bad in general, so it must be bad when it happens to me. That is part of it, to be sure. Death in other things, especially humans, and more so in the case of humans to whom I have special attachments, produces negative reactions in me, so naturally the same thought applied to myself arouses dislike and displeasure. The death of others represents the destruction of values. In this sense, my death is bad in the same way, as seen from this abstract perspective. But this is only the minor

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**The annihilation of my  
point of view is the  
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of all reality.**  
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reason for me to see my death as bad. I cannot view my death as on a par with the death of other people. These things are not even comparable.

Why is this? Whenever I observe death or hear about it, it is always the death of organisms in *my* environment, from *my* perspective. This is fundamentally different from the death of me, the termination of my perspective. The deaths of all others are external: they are deaths within my experience, whereas my death is the termination of my perspective on reality; it is the end of all experiencing, including the experiencing of death. When people and organisms I value die, I have lost some value - I have lost the chance to interact with them, to enjoy them, and to learn

from them. But when I die, from my perspective, all possibility of value and enjoyment is taken away. The annihilation of my point of view is the subjective annihilation of all reality.

The "deathist" is one who is in favor of death in the sense that they think that death has its rightful place and life should not continue after a certain point. Now, when the deathist argues that his death does not matter and that he has no reason to prolong his life or to seek the abolition of death through science, he is making the mistake of seeing his death objectively, of looking at his death as if it were just like that of anyone else. I have tried to bring out above why I think that is a mistake. In claiming that his death does not matter the deathist is assuming a perspective that is not his own. He is stepping outside of himself, outside of his identity in an imaginative sense and saying that his death is really no different from the death of anyone else. But of course it is! His view is only sustainable by focusing on the perspective of nature as a whole (or humanity or living things as a whole).

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## **The "deathist" is one who is in favor of death**

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But I am not nature and I am not all living things. I am ME, I am this particular perspective on reality. I am a specific cognitive system which is a center of experience. All I see of reality is reality-as-I-see-it. I am this looking-out at the world (including that part of the world inside my head). The loss of this is not comparable with the

loss of other consciousnesses - not from my point of view. Of course, your death is to you vastly more significant than my death is to you, in the same way as mine is to me. It is true of each individual that their own death is the worst thing that could happen to them. My own death is not comparable to the death of anyone else from my own perspective. And my perspective is the only perspective that I can have since it would not be my perspective if it were not the perspective I have. Of course I can, in a sense, adopt another perspective - that of another person or of "nature" as a whole, but when I do this I am just suppressing thought of what I really am and of what my perspective actually is in order to gather more information about the world.

### Self-deception about the nature of death

I suspect that the deathist, at the times when he discusses or thinks about death, adopts these alien perspectives as a defense mechanism. It is a defense against facing the true nature of death. The brain mechanisms and sub-systems that automatically mislead us about the true nature and evil of death may have served a useful and merciful function throughout most of human history. Until recently there was no rational hope of avoiding death (I do not see religious views of life after death as being rational), and so we might regard the death blindness as helpful to the well-being of past people. I strongly doubt that this is really true but won't discuss that in this article. Whatever the truth of this for the past, the death-blindness, the deathist view, is now detrimental. Now we are finding it harder and harder to avoid realizing that religion is nonsense

and that when we die that's all she wrote. At the same time we now have the chance of finally killing death, of destroying the destroyer, of annihilating the annihilator.

Now is the time to cast aside our cowardly self-imposed blinkers, to recognize our death for what it is, and to join in the hunt to find death and to deal with mercilessly. Now is the time to promote life extension research with the hope that the aging process will be understood and under control by the time

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### **Clearly It's Insane to think that whatever is natural is *ipso facto* good.**

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we are at high risk. Now is the time to make arrangements for cryonic suspension - the only feasible way to avoid death in the event that it claims you before science has conquered it. Decades from now we should have the opportunity of avoiding the death that results from complete accidental destruction of the biological carrier of consciousness. This may be possible through simultaneous existence as programs in many computer-minds, or through reactivation of recently stored back-up copies of the self. Death is no longer known to be inevitable. For each of us, whether or not we die may now be largely a matter of choice. Deathism will stop us from seeing these things. Deathism is a lethal belief-system.

### **But it's natural!**

I'm staggered that so many people, including otherwise intelligent people, will defend death on the ground that it's natural. It's not entirely clear what "natural" means<sup>2</sup>, but here I'll take it to mean "without intelligent alteration in the course of events". This argument against using human intelligence and technology to remove death by aging and natural causes seems to involve the equation: natural = good. Without getting into a heavy discussion of the meaning of goodness, let us see if this equation strikes us as plausible. What can we think of that is natural?

Having to kill animals for food is natural.

Suffering injuries is natural.  
Suffering unrelieved pain is natural.

Using violence to get what you want is natural.

Heart disease is natural.

Diseases are natural.

Ignorance is natural.

Starving to death is natural.

Fear of the unknown is natural.

Sunburn is natural.

Gangrene is natural.

Clearly it's insane to think that whatever is natural is *ipso facto* good. Often natural hands us a raw deal and only the application of human intelligence can relieve us of the problem. Nature is blind and cares nothing for human interests. If we want to have our way we will frequently need to rebel against our natural lot. Death is natural because nature had no interest in designing us for unending life. All nature - or the part of it represented by our

genes - cares about is reproducing. Our bodies are gene machines, built to spread DNA. This task does not require long lived bodies; in fact it is apparently more efficient to build throw-away bodies which reproduce quickly. Our interests are not those of nature. Our interests can only be fulfilled by the defeat of natural death. To deny this on the ground of naturalness is an act of cowardice; it is to act as a willing serf to the whims of a stupid ruler.

### Death and the meaning of life

Even more incredible to me than the idea that one's own death is not bad because it is natural, is the idea that death is necessary to give meaning to life. This is the view defended by Bernard Williams in the arch-deathist article "The Makropulos Case: Reflections on the Tedium of Immortality"<sup>3,4</sup>. I suspect that Williams went through something like the following rationalization in order to reach his position. He started off by realizing that he was going to die and he understood on some level that this was a very bad thing for him. Since he was unable to believe in the lying promises made by the religions and yet he did not want to face death in the raw he felt that he would have to conclude that life was meaningless because it would end. Since he was unwilling to believe that life was meaningless, he forced himself into the conclusion that life is meaningful but only because it is finite.

The two mistakes here are firstly in moving from the fact of death to come to the conclusion that life has no meaning and, secondly, in holding that life is meaningless without a specified limit. Life gains meaning and value from the set

of projects, goals, and activities of the individual. We each give meaning and value to our lives by choosing our concern, beliefs, and activities. Death puts an end to any further activities and it is likely to prevent the fulfillment of some of one's goals. Being dead means that the value and meaning of one's life comes to end, except in so far as these values are maintained in other people - but this is then an element of the value of *their* lives and not of the dead person's. Since after one is dead one no longer has a life then obviously one's life cannot have meaning or value after one has died. But why should anyone conclude from this that their life has no meaning *now*? It does not follow from the fact that the value and meaning of one's life will come to an end that it has no meaning and value while one is alive. Death is a terrible thing to happen since it is the end of your

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**It does not follow from the fact that the value and meaning of one's life will come to an end that it has no meaning and value while one is alive.**

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universe, the end of experiences, and the end of all future possibilities for you. These facts, however, do not remove the enjoyments and rewards of life as it is in the present, although the realization of what is to come may dull that enjoyment since you expect it to come to an end.

What about Williams view that life is meaningless unless it has a definite limit? This incredible view has to be, as I suggested above, a massive rationalization. The idea seems to be that we see our lives as proceeding through various well-defined stages such as infancy, childhood, adolescence, adulthood, and old age. We adjust our activities and shape our lives to fit into

the roles which we are expected to play within each of these stages. Williams apparently believes that immortals would drift along, running out of things to do, feeling that they lack a defined place and set of activities, and would suffer from a resulting boredom and stagnation. (Perhaps Williams also favors feudalism, in which everyone had an assigned place in the 'natural' order.)

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## There Is no reason why we should need to pass into decrepit old age in order to preserve interest in our lives.

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This strikes me as the view of a lazy mind or a mind of someone with a tiny imagination. Firstly, there is no reason why we should need to pass into decrepit old age in order to preserve interest in our lives. Indeed, it is the ravages of old age that are most likely to take away the enjoyment of life (though even very many physically decrepit people maintain a zest for life). Secondly, "adulthood" is not a singular stage in which there must come stagnation. Even if an immortal could ever exhaust the potentialities of his current interest, he could move on to other things. A spent philosopher could spend decades or centuries learning history, economics, political theory, physics, chemistry, biology, geography, astronomy, cosmology, neurology, artificial intelligence, or anything else. He could learn the piano, the synthesizer, trombone, drums, oboe, flute, piccolo, or he could learn to write music or to conduct.

The immortal could learn to paint, to write novels or poems. He could devote himself to acquiring wealth, building houses, cities, space colonies, planets. And by the time he's mastered any of these, new areas of study, new arts, and new activities of every kind will have evolved. New technology will allow the immortal to continually modify and improve himself, to move himself along a path that will make him less human and more godlike over the eons. He will meet new people, form and terminate friendships and love relationships, and he will move from culture to culture. There will be no way for him to run out of possibilities. The options available will continually expand faster than he can take advantage of them all. Nor should we expect immortals to slow down or to think that they can put anything off forever since environments change, opportunities are formed from the unique convergence of persons and events and will often be unrepeatable.

## The Source of Motivation

A common argument to the conclusion that death doesn't matter is that death will not matter to us when we are dead and so it should not matter to us now. This argument involves a rather large logical leap! Of course death won't matter to us when we're dead, but that's because nothing will matter to us for the very good reason that we won't exist. It's misleading to even talk about things not mattering to *me* when I'm dead because I won't exist and so I cannot be referred to. There will be no '*me*' for it to be said of that death doesn't matter to me. While I am alive the situation is entirely different for I *do* exist and things can matter to me. My death especially matters to me since it is the destruction of the subjective universe; it is the impending termination of all my hopes, dreams, plans, attachments, relationships, experiences, and possibilities. I cannot imagine what it is like for me to be dead because it will not be like anything. There will be no experiencer to have that experience. But, again, the fact that I will then not be upset at being dead is irrelevant to whether impending death should concern me now, for after death the person is no longer in existence to be upset at anything.

Not every living being has reason to live. Reason to live derives from the possession of goals, values which require time to be fulfilled. If an organism has no goals or values then it would have no reason to live, but this situation characterizes rather few of us! The possession of any goals logically commits one to desiring more life as a means to the attainment of those goals. That one

will no longer have goals when one is dead is irrelevant to having reason to live. As long as one *is* alive one does have reason to continue. Clearly the *more* goals, plans, and values yet to be realized in one's life, the more reason one will have to live. Many people who commit suicide or who just waste away are those who have lost interest in life by some neurotic process. There is *always* plenty to do - only neurosis can lead one to forget that. Certainly, one's plans will be frustrated every so often, but the healthy mind will always dismiss the failure and try again or else select new goals to move toward. Extropians, having very many wide-ranging goals and deeply held values which are oriented towards expansion, improvement and development of oneself and one's environment, have an enormously powerful will to live. That is why we are immortalists rather than just people who want to live our 80 years in good health.

It seems to me that those who cannot see why death is a bad thing are sick. For a thing to be sick is for it function inefficiently, to fail in its function. A mind is sick when does not function efficiently. A healthy mind is a thing which explores, which loves information and ideas, which finds new ideas and perspectives and the understanding they make possible deeply appealing. Death is what puts a final end to all possibilities of learning, of exploring, of improving. Sickness has crept into a mind to the degree to which it prefers to be satisfied with what it is, or which stagnates and allows understanding to slip away. A sick mind cries "Enough! I don't want to know any more. I don't want to understand reality any better. I want to stop, to stagnate, to dissolve and die." An immortalist is someone who

understands that physical death is the end of existence as far as he or she is concerned. The immortalist loves the process of living and learning and so regards death as the ultimate enemy who has to be avoided or hunted down and exterminated by protecting against all possible causes of destruction of the self.

I hope to have dispelled some confusions surrounding the nature of death and to have shown that it *is* something about which we should be very concerned. If you were already in agreement with this view when you started, perhaps you will find that you've acquired additional insight into the deathists' views and feel more equipped to pull them apart. Deathism threatens not only those who believe it but also those of us who are already immortalists. Deathism must be challenged and extirpated if we are to ensure our own survival. The more people who we can get to see the light, the more lives will be saved from the endless black pit of death.

#### Footnotes

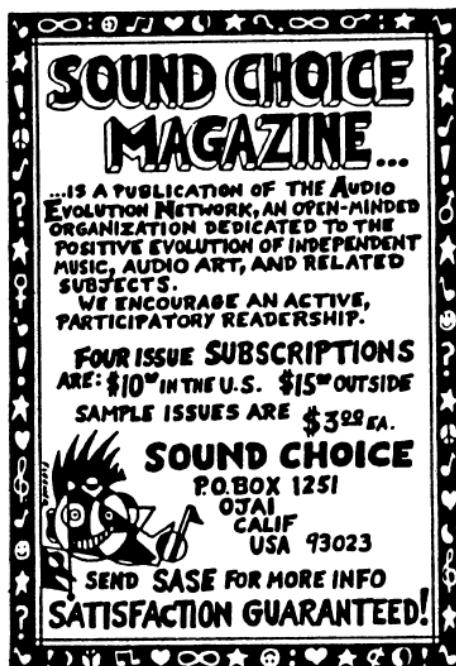
<sup>1</sup> See the excellent discussion in Derek Parfit, *Reasons and Persons*, (Oxford University Press, 1984).

<sup>2</sup> I intend to deal with the issue of natural/unnatural in the next issue, from a variety of angles. The "it's not natural" argument (if it can be called that) is used to promote entropy in many contexts.

<sup>3</sup> Bernard Williams, 'The Makropulos Case: Reflections on the Tedium of Immortality", in *Problems of*

*the Self*, (Cambridge University Press, 1973).

<sup>4</sup> For a philosopher with a much healthier attitude, see Thomas Nagel, *The Subjective View*, (Oxford University Press, 1986), pp 223-231. Nagel says "...given the simple choice between living for another week and dying in five minutes I would always choose to live for another week; and by a version of mathematical induction I conclude that I would be glad to live forever. Perhaps I shall eventually tire of life, but at the moment I can't imagine it, nor can I understand those many distinguished and otherwise reasonable persons who sincerely assert that they don't regard their own mortality as a misfortune." Of Williams he asks, "Can it be that he is more easily bored than I?".



# TWO REVIEWS of FM-2030's ARE YOU A TRANSHUMAN?

(Warner Books, 1989)



## Review #1

by  
**Mark Potts**

Although "FM-2030" sounds like the name of a radio station, in fact it is the new identity for the pioneering extropian futurologist F. M. Esfandiary. While teaching at the New School for Social Research in the 1960s, FM (as he now prefers to be called) helped to invent the field of futurology before the discipline even had a name. In the late 1970s, his three paperback books - *Optimism One*, *Upwingers*, and *Telespheres* - presented a daring vision of the future, sort of a brave new world without the guilt. Today FM "translives" in Los Angeles and teaches at UCLA Extension. From his experiences has come a series of self-tests published in his new book, *Are You a Transhuman?*

FM describes his self-concept by saying, "I am a 21st-century person who was accidentally launched in the 20th. I have a deep nostalgia for the future." As a result of his conviction he has added "2030" to his first two initials to demonstrate that he uses the word as he imagines it in the year 2030 for evaluating today's world.

Unlike other futurologists who focus on the alienation and destruction caused by technology, FM has specialized in identifying and encouraging those

values which he considers adaptive for dealing with rapid change. The 25 self-tests or 'monitors' in his book each list a number of multiple-choice questions, along with a scoring guide and explanations for what FM considers the 'correct' answers. The purpose in taking these tests is to measure your rate of personal growth (RPG).

For example, in Monitor 1 ("How Updated Is Your Vocabulary?") FM offers two columns of words. In the left column are traditional phrases such as 'illegitimate child', 'God willing', and 'Far East'. In the right column are their modern alternatives: 'child', 'Let's go for it', and 'East Asia'. FM explains that the growth oriented person will tend to choose the words on the right. After all, a child should be cherished regardless of how it got here, 'God' is a meme which dampens human initiative, and the idea of the 'Far East' is a holdover from the Eurocentric colonial past.

Other monitors measure your RPG in the areas of intelligence, emotions, technology use, social attitudes, and philosophy. Monitors 24 and 25 - "How Immortality Oriented Are You?" and "How Transhuman Are You?" - go all out to promote the agenda of would-be immortal superhumans. Cryonicists should find these two especially agreeable.

Finally, FM asks you to add up the individual scores from all the monitors, and breaks down the summed scores by range to indicate how high your

RPG is. He then proposes a number of "stretching exercises" to help you to get your RPG up to where he thinks it should be. For example, "List five events (including discoveries, setbacks, etc.) of the twentieth century that will be remembered a hundred years from now."

Although your bookseller may want to shelf *Are You A Transhuman?* in the New Age section next to the latest trance-channeling drivel, it does rationally address the right extropian issues: intelligence increase, life-extension, self-esteem, the wise use of technology, etc. It is almost custom-made to teach extropian values, though somewhat lacking in intellectual depth.

On the down side, however, I have to disagree with FM's assertion in Monitor 16 ("How Ecology Conscious Are You?) that trying to save endangered species is a waste of time. And in Monitor 6 ("How High Tech is Your Attention Span?"), FM argues that intellectual activities lasting longer than a television show are not worthwhile. But if a person wants to study and master mathematics, science, and engineering - subjects which are hard even for smart people - a long attention span is essential. These are the very disciplines extropians are counting on to create the technological marvels needed for our survival.

In spite of these limitations, *Are You a Transhuman?* is a fun book which should shake up the memes of the people who have given little thought to the future. In the text FM mentions that he has another book, *Countdown To Immortality*, due out later this year. He should be commended and financially rewarded for his extropian communications.



## Review #2

by  
Max O'Connor

FM-2030's book is a refreshing burst of extropian light, blasting through the gray gloom of conventional thinking about the future. Reading this book, invigorates even a long-time extropian, while for the non extropian or the semi-extropian it will be a lively and enjoyable mindfuck. Some of FM-2030's views will be controversial among extropians; I will reserve commentary on his sections on ecology and competition for the next issue's Forum, where we can attempt to approach the truth. Here I would like to add to Mark's review by mentioning some other parts of the book.

Monitor 18 - "How Global Are You?", is an excellent plea for abandoning nationalism and reorienting one's outlook to a global perspective. Not only does he attack blind patriotism (which is not so uncommon these days), he goes so far as to state that national borders should be abolished - a position held by libertarians but by no one else I know of. FM declares that "There are no illegal aliens - only illegal borders", and tells us that "National frontiers are nothing more than pissing borders charted by dogs. 'This is my territory because I peed here first'." He points out that the attempt to control the movement of persons on this planet are becoming increasingly futile; vast numbers of people work and partly live abroad. Multinational corporations can move people and resources around with little regard for irrational governmental decrees, international transportation is getting cheaper, and economic interdependence provides incentives for

loosening restrictions. Those who moan about the Japanese "owning America" are living in the past; a past (which never really existed in pristine form) where a country contained a single racial and cultural group and where entry of 'foreign' elements was seen as invasion, disruption, and threat, rather than as integration, diversification, and cultural evolution. Western Europeans are overcoming their traditional hostilities and suspicions and are integrating their economies and polities with a rapidity that surprises even me - and I lived in England until two years ago. Even the conservative "President" Bush has called for the tearing down of the Berlin Wall and has proposed the abolition of visa requirements for West Germans visiting America (something that's already happened for British visitors).

Monitor 15 ("How Family Oriented Are You?") presents a historically informed projection of trends taking into account foreseeable changes in technology. FM-2030 tells us that the nuclear family (father-mother-children) is only a hundred years old and not the eternal and essential institution the conservatives believe in. The nuclear family is disappearing; while the traditional nuclear family (working husband, wife at home, several children) existed in seventy-five percent of all households in the 1950s, it is now down to under seven percent. Although the myth persists, it's now hard to take seriously the "until death do us part" marriage vow, given the vast increase in the frequency of divorce in an increasingly fluid and changing population. This vow is all the more absurd to those of us who don't intend to die!

FM attacks the family as the last stronghold of hereditarianism, and calls having one's own "flesh and blood" biological territoriality. He shows that terms like 'mother' and 'father' are taking on new meanings. Already, tens of thousands of children are high tech babies resulting from artificial insemination, inovulation, in vitro fertilization, and adoptive pregnancies. Coming up are *in vitro* gestation which will free women from the need to carry fetuses, and 'mosaic births' where a baby will have many parents and carefully selected characteristics. This raises interesting questions about legal responsibility for babies; the law will have to be flexible and meet the need to work out parental (or creatorial) rights and responsibilities in this new era.

In his discussion of optimism and pessimism, FM playfully and insightfully makes fun of American's preoccupation with pessimism and delight in inventing crises - "doomsday junkies" as FM calls them. After running through a list of fabricated crises, FM asks "Has anybody ever done a study to find out how long Americans could survive without a major "crisis"? Eight minutes? Twenty-six minutes? Would everyone start to panic if no new crisis could be staged? Would the entire country be put on no-crisis alert?" In this and the other sections of the book, FM-2030 brings a refreshing optimism, technophilism, and alteration in perspective to the issues. As Mark says, there is a lack of depth in the discussions (the compensation is a fast-paced and fun read). Extropy is just the place for analyzing these issues in more detail. Buy a copy and send us your thoughts on any aspect of FM-2030's vision of the future.

# **POSTSCRIPT TO 'MORALITY OR REALITY'**

**by**  
**Max O'Connor**

In "Morality or Reality?" in Extropy #1 I argued against morality, pointing out its baneful effects (from the point of view of *my* values, many of which will be shared by other extropians) and I explained that moralities constrain our freedom without being based on anything capable of rational demonstration. This is especially true of "objective" moralities - those which claim to be universally true. I claimed that the arbitrarily constraining nature of morality exists even when a moral system is accepted as a subjective construct. In this postscript I want to clarify my argument by looking at some different senses of the term 'moral'. I will conclude that in *some* sense of moral there is a rational grounding, especially in the case of moral rules governing interpersonal rather than self-regarding action.

I continue to maintain that moral systems that lay down rules without reference to individuals' actual desires, wants and needs are to be rejected by reason. No motivation exists to follow such rules, except fear and unreasoned indoctrination. This needs clarification since it appears that moralities such as Kantianism and utilitarianism *do* refer in some way to human desires. In Kant's approach, although sometimes he just

announces a list of duties that we *must* follow without regard to our desires (such as his rigid prohibition against lying), in many places he does use a formula that uses our desires as input to derive moral principles. This formula is the Categorical Imperative, which can be stated as "Act so that the maxim [principle] of your action can be willed at the same time to be a universal law". It's not my purpose here to analyze Kant's theory in detail so I'll just say that this means that when you are considering acting you should (a) determine the principle on which you are to act, and (b) ask yourself if such a principle could be acted on by everyone. (b) breaks down into two tests: (1) Is it possible to even conceive of a world in which everyone acts on this maxim? (2) If so, could you find such a world desirable?

Again, very briefly, the objections to this theory are that, firstly, it is impossible to apply. On what principle are you acting? If I want to shout at you am I acting on the principle that unreasonable people should be shouted at? Or is it that angry feelings should be vented? Or is it that angry feelings which are justified should be vented? Or that one should allow anger to be expressed if it might accomplish

something useful? Or that one should be spontaneous? A indefinite number of principles are compatible with the action, so it seems that Kant's theory provides no guidance. Secondly, why should I universalize my principle? Most people are *not* in my situation. Many of those who are will have a different set of preferences and desires; why should I expect them to act like me? What is the relevance, even if I could establish the effects, of the fact that I wouldn't like the result if everyone acted this way in similar situations? Others *won't* act the same way since they are not me.

Utilitarianism will be my sample consequentialist or teleological theory (as Kantianism was my sample formalist or deontological theory). We can ignore the many variants on the basic idea which tells that the good is pleasure or happiness and that right action consists in maximizing the total happiness of everyone. There are very many problems with utilitarianism; here I am concerned with the basic motivational question: Why be moral? If morality is utilitarianism then why should I have any interest in it? What if I fundamentally value things other than happiness or pleasure? What if I value my own happiness but not that of others? What if I do sometimes value the happiness of others but I am not interested in simply maximizing the total regardless of whose happiness it is, whether I feel they deserve it or whether it harms *my* happiness, values or goals?

This lack of motivation seems to infect all moral theories which claim to apply to all of us. Alan Altruist *might* hold as his most fundamental value, the one outweighing all others, the maximization of total happiness. If he does then he will be motivated to do as

utilitarianism says. But that's because he already has such values. To Ellen Egoist or Edward Extropist or William Wisdomist Alan's "theory" will be irrelevant. The basic problem with all the supposedly objectively true moral theories is that they cannot answer the question "Why be moral?". Since moral systems codify a set of values which are not *my* values, I am left without reason to act on those systems. What I have reason to do depends on what values I happen to have. In an extended sense we can say that I also have reason to do something even if I don't want to do it *if* doing this other thing will actually promote the values I have. I will return to this in a moment.

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**The basic problem with  
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What of accepting a morality as a guide to action without claiming any objective truth for it? You might decide to act according to moral system M, but not claim that others have reason to do the same. I have less objection to this, but the same arguments apply to a lesser degree. Presumably you choose system M because it seems to codify and formalize the values you actually hold. You adhere to M because having a moral system

makes it easier to remember what action you should take, given the values you have, on occasions when you have insufficient time to deliberate. But if you really see M as a *system* then as your values change, as they inevitably will, M will push you into doing things that it is no longer rational to do. Again, by "rational" I must mean the action which will best promote your values, whatever they are.

The amoralist rejects systems on these grounds. The subjectivist clearly has a point when she argues that it helps to have principles worked out beforehand which can be applied quickly. The amoralist takes account of this by having a set of well considered principles on which to act, yet he is careful to avoid the idea that these do or must form a system. They are principles which have to be balanced against each other and which will change over time. Protecting those principles from revision by enclosing them in a *system* partially defeats the purpose of having those rules - which is to act effectively on the basis of one's current values.

### RATIONAL MORAL RESTRICTIONS

I have hinted that in some sense of 'moral' it may be rational to accept a morality which constrains pursuit of personal values. There are two (related) areas in which this could be true. The first is the personal area where your actions do not have significant direct effects on others. This will involve choices such as which occupation to choose, which type of food to eat tonight, and so on. In this area I doubt that there are any external restrictions on one's

preferences to which it would be rational to pay attention. Clearly it makes sense to examine the facts in order to come to a decision; but in the absence of special information about the likelihood of being poisoned if one eats Thai food, there is no reason anyone can give you why you shouldn't eat Thai. If you want to, then you have reason to.

The situation is different in the area of action involving significant effects on others. If your actions will interfere with the pursuit of others' goals (or help them) then there are some principles which you are very likely to have reason to accept even though they may limit the actions you can take. However, it would be irrational to accept these principles unless you will *gain* something by doing so; gain in the sense that your own goals will be more effectively promoted by adherence to these principles.

The principles I primarily have in mind here are the ones which are *rights* people have against one another. This is not the occasion for a detailed discussion of rights theory (Jan Narveson's *The Libertarian Idea* and David Gauthier's *Morals By Agreement* are recommended). I wish to simply point to an area where, given that you have goals and values which you want fulfilled, it is rational to accept restrictions on what you would otherwise do. In my view it is rational to instill in yourself a disposition to respect negative libertarian rights - rights against interference with persons and their private property. Details of what these rights are and why we should accept them can be found in Narveson's book. The essential point is that by encouraging this disposition to respect rights in oneself and others, I and everyone else

will better achieve our goals. We will increase our overall freedom to pursue our values and to live our lives as we wish. If a society of people exists in which they have justified confidence that they can deal with people with little or no fear of physical assault, theft or fraud, then each person can save the resources that must otherwise go into protection against these likely contingencies and would be able to reap large gains from cooperation. Not all these principles will have the status of rights (which are enforceable claims). A disposition to keep promises or to be honest may be things that are rational even though you had no prior desire for them.

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**So there are rationally acceptable restrictions on our behavior.**  
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So there are rationally acceptable restrictions on our behavior. Apart from the principles we have reason to internalize as attitudes in order to promote the conditions of efficient social interaction, we may devise tentative principles for ourselves which guide our actions to promote our true goals and enable us to resist immediate temptations. Is this morality? This is a verbal matter in part, though not unimportant because of that. Sensible use of words is determined by the conceptual environment in which they exist, and the choice of language can have profound effects. In refusing to talk of internally

generated values and principles as "morals", my concern was to distance rational behavioral constraints from externally generated systems of rules, such as those deriving from a religion, society, or unfounded philosophy. That is, I wished to clearly distinguish a code of values which imposes an alien control and constraint on the self from a code which is designed to allow full expression of a self.

My comments in Extropy #1 should be construed as comments about the traditional, restrictive conception of morality, a conception used to crush individuality and to control people for various religious and political ends. If we use Rand's helpful definition of morality as a code of values to guide one's actions, then what I am proposing *is* morality, even though its purpose is the maximization of self-expression given the nature of our human selves and the world around us. On this view it may turn out that characteristics such as rationality and integrity will be of value to all persons given minimal initial choices such as a decision to live and to be happy. Instead of "amoralism" I will in future refer to "autonomous morality" or "personal morality". This will preserve the connection with what most people think of as morality and will therefore make communication and spreading of these ideas easier. Though part of me likes the radical move of saying that morality should be thrown out, the larger part of me concerned with clarity and effective communication now prefers to retain the use of the term 'morality', even if in a different form.

# Efficient Aesthetics

by  
**Tom W. Bell**

**Beauty!** We long to experience it, to create it, to *become* it. We *lust* beauty. How can we satisfy this lust? That's a question for aesthetics, the study of the nature of beauty. By revealing beauty's underlying principles, aesthetics will show us how to bring more joy, grace, and wonder to our lives.

## The Scope of Our Enquiry

Because we have a practical interest in aesthetics, I'll be discussing a particular sort of beauty: the beauty we find in the presentation of works of art.

We must limit the scope of our investigation because the principles of aesthetics apply to *all* of the many things we call "beautiful": the clear night sky, a woman's lines, Van Gogh's "Sunflowers", . . . Humans have the power to consciously create only *some* of these beautiful things, however: those which we call "works of art". Art is artifact. It is not natural; it comes only from human culture. Since we're interested in learning how to make our lives more beautiful, then, I'll limit the current discussion to the aesthetics of art.

I'll limit the discussion in another respect, as well. Art can be beautiful thanks to either its content or its means of presentation. Consider Constable's "Country Lane": we might call it beautiful because we love country scenes, or because we admire his skill in rendering the shadows of an impending

storm. It is only the latter sort of beauty that I'll discuss here. While beauty-as-content plays a large role in most people's aesthetic evaluations, it depends too heavily on subjective values to admit an objective investigation. I know of atheists, for example, who look upon Michelangelo's "Creation of Adam" as an ugly bit of Christian propaganda.

The beauty of an artwork's presentation, on the other hand, concerns art *per se*, independent of its content. We can evaluate this sort of beauty somewhat more objectively, allowing us to find the universal aesthetic principles we seek.

Keep in mind, then, that when I speak of "beauty" in what follows, I mean the beauty of the presentation of works of art.

## A Hypothetical Definition of Beauty

Art is a means of transmitting information.

Be they painters, musicians, dancers, or otherwise, artists aim to communicate their ideas to an audience.

They are skilled technicians who observe the world, both internal and external, and convey their experiences to us. This description by no means discounts the importance of creativity, however. To the contrary, it takes great imagination to choose the most effective means of conveying information. One might argue, in fact, that art's most imaginative leaps have been those that have carried it from old to new modes of expression -- consider the introduction of pointillism, cubism, atonality, or constructivism.

If artists are communicators, we would consider the best artists to be the best communicators. But we also praise artists for the beauty of their work. Noting this correlation between the efficiency with which an artist communicates and the beauty of the resultant art, I offer this hypothetical definition of beauty:

*The beauty of an artwork's presentation covaries with the efficiency with which it transmits information.*

In more exact terms, we might say that

$$B = O/I$$

where  $B$  = the beauty of a work of art,  $O$  = the amount of information those who experience the art draw from it, and  $I$  = the costs they incur to so experience it.

I can hear the hue and cry already: "You can't just break beauty down into an equation! It's something you just *feel!*" Having long been both a practitioner and patron of the arts myself, I know all too well of the art crowd's bias against reason. If it's any comfort to those of you who balk at my quantitative approach to aesthetics, I

won't claim that I've managed to sum up the essence of beauty in the simple equation  $B=O/I$ . Nevertheless, in what follows I'll demonstrate that this definition of beauty *does* accord with popular opinions about art, or "folk aesthetics," in a remarkable number of cases. But before going on to examining some of the field data, I ought to say a bit more about what's being measured.

We might say that according to  $B=O/I$  the most beautiful art gives you the most bits per buck. That's because  $I$  is measured in bits and  $O$  is measured in dollars, thereby making  $B$ 's units *bits/dollar*.

The beauty  $B$  of any particular artwork will vary from person to person because the values of  $I$  and  $O$  will vary from person to person. The amount of information that one draws from an artwork fluctuates along with one's familiarity with the medium, the artist, and the particular work of art (among other things). After listening to a live version of AC/DC's "Highway to Hell", for example, a heavy metal fan can tell you whether it comes from early or late in the band's career. It will simply sound like noise to one who knows only classical music, however.

Different people will likewise incur different costs of experiencing any given artwork. The measure of  $O$  includes many factors. It may include the charge for admission to a museum, or tuition paid to attend a class on appreciating modern dance, or the price of a sophisticated stereo system.  $I$  will thus vary widely from one art-experience to another, from person to person experiencing the same artwork, and perhaps even from an individual's experience of the same artwork at one time to another.

The fact that the  $B$  of an artwork varies widely across different people and times does not mean that beauty is subjective -- it means only that beauty is *instance-specific*. Given enough knowledge of the workings of the human brain and the economics of art appreciation, we could calculate the exact value of  $B$  for any person's experience of any artwork at any time. We would not have to depend on a subjective claim like, "Yeah, it was a jammin' concert."

In the following applications of the  $B=O/I$  formula, I'll be ignoring individual and temporal variations in the value of  $B$ , instead imagining that we have calculated  $B$  for each instance the artwork has been observed and taken an average of these figures. With this in mind, then, let's see how well  $B=O/I$  fits our commonsense aesthetic evaluations.

### Confirming Evidence

This information-theoretic definition of beauty agrees with widely-held aesthetic judgements in a remarkable number of cases. In a very general sense, this can hardly help but be true. The successful transmission of information is at least a *necessary* condition for beautiful art -- how could you appreciate beautiful music without hearing it, or a beautiful painting without seeing it? But the correlation between efficiency of information transfer and beauty runs much deeper than this.

If  $B=O/I$  holds true, then we would expect that as artists condensed more information into their art their artwork would be judged more beautiful (all else being equal). And this indeed seems to be the case. Consider the popularity of finely detailed art like the

"The Book of Hours," or of miniature such as Tiffany eggs, or of Arabic *horror vacui* architecture.

Intellectuals tend to favor another means of increasing the information density of art: "multiple encoding". Artists multiple encode by loading a single symbol with more than one meaning -- thus the viewer gets two (or more) references for the price of one. Consider the value placed on "heavy" art, that is, art with deep symbolic import. Magritte's paintings provide a good example: technically speaking they're rather primitive, and their subjects aren't particularly attractive (men in bowlers? fish with legs?!). Nonetheless, we appreciate Magritte's work because it symbolically conveys a feast of ideas. Or consider Swift's *Gulliver's Travels*. Most people know it as simply a fine tale, but it is esteemed as *art* because it hides subtle political satire.

We see multiple encoding at work in much of Shakespeare's writing, as well. He's infamous for his punning. He even makes puns about puns! Referring both to the etymological derivation of "pun" from "hammer", and the merciless oneupmanship of highbrow wordplay, he has Theristes, in *Troilus and Cressida*, say "He would pun thee into shivers with his fist." Shakespeare knew that a good pun helps to load in more meanings per reference: "I moralize two meanings in one word." he explains through Richard III.

In addition to dense-packing information, artists can increase the beauty of their art by making it easier to recall. Originally, poets wrote their rhymes in verse for just this reason; before the written word, a bard had only his memory to rely on, and a good rhyme could ease his task. To a lesser degree,

non-rhyming metered verse accomplishes the same thing. That's why Shakespeare wrote in iambic pentameter: it helped his actors to remember their lines. Rhymes and rhythms increase art's O/I ratio by ensuring that it will be reproduced and re-experienced. For the cost of listening to well written verse a few times, we can freely recall it, again and again, to enjoy at our leisure.

Musicians especially favor increasing the beauty of their art by making it easier to remember. Pop artists search for the best "hook": that little bit of a tune that sticks in your head, the part you can't stop humming. Great classical music has the same effect -- who can't recall the opening bars of Beethoven's "Symphony Number 5 in C Minor"? This is meme engineering at its best! One exposure and you're infected, becoming a carrier of "Bum Bum Bum Bummmmm," singing it aloud and infecting others. Clearly, such efficient music maximizes O/I.

What does a good musician communicate so efficiently? The abstract nature of music precludes a specific message. Good music captures the state of mind of its composer. By expertly expressing what she feels when she composes music, a musician can let us share her thoughts. She'll write memetically efficient music when she records her most pleasant thoughts -- those are ones we're most willing to experience ourselves. But sometimes humans feel sad, or reflective, or angry. Musicians have written beautiful music for these moods, as well -- beautiful because we empathize with it, we understand it.

## The Theory's Explanatory Power

A good theory not only jibes with the field data, it solves old puzzles. Consider how this theory of "efficient aesthetics" accounts for abstract art.

Abstract art remains a mystery to most people. They can't understand what it is supposed to mean. They don't see its beauty. The more they study abstract art, the less they see.

Is abstract art beautiful? In its way, yes. Compare a conventionally realistic painting, Da Vinci's "Mona Lisa", with any one of Jackson Pollocks canvases (they're all about the same). The Da Vinci has a high information content, say 1,000,000 bits. It takes a lot of careful attention to detail and some background knowledge to draw this information out, though, so on the average it might cost \$1,000 to fully experience the "Mona Lisa". The O/I formula gives us the "Mona Lisa"'s beauty, B:

the "Mona Lisa" --

$$\begin{aligned} B &= 1,000,000 \text{ bits}/\$1,000 \\ &= 1,000 \text{ bits}/\$ \end{aligned}$$

On the other hand, the Pollock doesn't have a lot to offer. It may only contain 10,000 bits of information. As compensation, it doesn't demand a lot of work to understand it (free-wheeling art critics to the contrary). You scan it briefly and say, "Oh, I get the idea: he poured buckets of paint on the canvas. Nice. It'll look great in the company lobby." The painting itself might cost you \$450,000, but it only costs you \$10 of

time and effort to *get it*.<sup>1</sup> We thus equate the Pollocks *B* as:

$$\begin{aligned} \text{the Pollock} & \sim \\ B & = 10,000 \text{ bits}/\$10 \\ & = 1,000 \text{ bits}/\$. \end{aligned}$$

Both the Da Vinci and the Pollock offer \$1000 bits/\$. We might say they both have "1,000 units of beauty." This shows that radically different paintings can be equally beautiful. It also gives us the secret to appreciating abstract art: don't think about it too much.

### The Theory's Predictive Power

A good theory makes accurate predictions. Given that people seek beauty, and that beautiful art offers many bits to the dollar, we would expect to witness a constant movement from less to more efficient mediums. That has indeed been the case. Medieval painters used tempera. Renaissance painters moved to oils. Why? Because oil paint is easier to use (thus lowering the artwork's price) and allows for greater realism (thus increasing recognition). Oil paintings have made way for photographs, a less expensive and more accurate means of transferring information. Movies quickly surpassed photographs; though movies cost consumers a little more, in return they offer a bounty of information. These days people prefer TV to movies. TV's may offer less information than movies, but on a per hour basis they cost much, much less.

From tempera to oils to photography to movies to TV, art has

evolved into more and more efficient forms. What does this trend tell us about the future of art? Look for more cheaper access to information-rich mediums. High definition TV (HDTV) will soon bring super-sharp, huge images to the living room wall: a movie theater in every home!

Art that uses more senses and dimensions will follow. We'll have 360° movies - in 3-D! Then maybe "feelies": movies that provide touch along with sight. Eventually we'll experience artworks indistinguishable from everyday waking reality; perfect worlds for pennies.

### Conclusion

We began this essay by asking how we could bring more beauty to our lives. This quickly led us to consider the nature of a specific sort of beauty: that found in the presentation of artworks. I offered a hypothetical definition of beauty,  $B=O/I$ , noting that the formula gives instance-specific (but not subjective) measures of an artwork's aesthetic value. Next, we saw how well this account of beauty correlates with the judgements of folk aesthetics. We investigated a couple of methods by which artists make their art more beautiful: multiple encoding and easy recall. Finally, we tested the theory of efficient aesthetics for its power to explain and predict, and found that it scored high on both counts. How can we make our lives more beautiful? By making our art more efficient.

(I would like to thank Dr. John Hospers for his helpful discussion on these issues, though I cannot hold him responsible for my errors.)

<sup>1</sup>Get it?

# INTELLIGENCE AT WORK

## *Advances in Science*

**Summarized by Max O'Connor**

### **Life Extension**

(1) Caleb Finch, gerontologist at the University of Southern California, stated that a molecular biology of aging has developed only in the last five years. As old theories of aging are thrown out - such as the idea of random error accumulation in the genes and proteins of a cell, and that a single gene controls aging - more complex views are emerging. It now seems clear that a genetic program is responsible for many age-related changes. The McKay/Walford dietary restriction program affects the genetic program; this regimen, when tried on rats, produces an enhanced expression of some genes in liver tissue.

Senescent human cells become unable to divide further. This has been associated with a lowered level of a bound form of the protein ubiquitin. Other researchers have found an as yet unidentified substance which is present only in senescent cells and which inhibits DNA synthesis. Mary Beth Porter, at the Baylor College of Medicine in Houston, has found a variant form of fibronectin which is present only in senescent cells. Fibronectin is a protein that maintains the position and shape of cells. Other scientists have shown that changes in gene transcription in aged cells often affects fibronectin. Following the financial success of Retin-A for Johnson and Johnson, venture capitalists are

already expressing interest in the fibronectin discoveries. Free markets and science continue the onslaught on death!

(2) The antioxidant vitamin E boosts the immune system. In a study at Tufts University, one group of older people was given 800IU of vitamin E a day for a month. Compared to the control group, this group showed increased cell-mediated immune response and greater T-Cell secretion of Interleukin-2.

(3) Ephedrine, derived from the ephedra herb, is an easily available substance which as long been used as a tonic, nasal decongestant, for asthma, and for relief of gastric cramps. It is now known to promote thermogenesis in which brown fat is stimulated to burn the usual white body fat to create heat. While weight loss by calories restriction is often 25% muscle and connective tissue (unless heavy duty exercise is maintained), ephedrine causes fat loss without dieting and without muscle loss.

(4) A new antioxidant drug, diethylhydroxylamine (DEHA) is one hundred times more powerful than BHT, and is relatively non-toxic. It has been found to prolong lifespan and to protect against cancer when inhaled. The lifespan increase seems not to be the effect of dietary restriction. Caution is suggested because higher doses increased mortality, and at all doses *maximum* lifespan was decreased.

(5) Isoprinosine (also called Inosine Pranobex +, Imunovir) is a drug shown to restore immune response towards normal and to augment anti-body production. Although it has some direct antiviral activity, it is primarily a powerful immunopotentiating agent - it works by enhancing the body's resistance to infection. Isoprinosine has been shown to be effective in inhibiting replication of viruses in cases of HIV, rhinovirus (common cold), cytomegalovirus (involved in the cancer Kaposi's sarcoma), Herpes simplex and herpes zoster, and genital warts. It is completely free of serious side effects, producing only occasional transient nausea when large numbers of tablets are taken.

(6) Phosphatidyl Serine has been shown to restore lost memory in animals, and reversed all the declining measures of memory and mental function in Alzheimer's patients. Phosphatidyl Serine is available in the Cognitex formula produced by the Life Extension Foundation (2835 Hollywood Blvd, Hollywood, Florida 33020-9982).

### **Computing, Nanotechnology, Micromachines.**

(1) Developing his discoveries of nineteen years ago, Arthur Ashkin at AT & T Bell Laboratories, is finding new uses for laser light. When a microsphere is placed in a laser beam, it is pulled towards the focal point - the narrowest part of the beam. The microsphere is kept in this position by electromagnetic forces perpendicular to the direction of the beam. Lasers can be used to trap microorganisms and to hold atoms in place for minutes while they are studied.

Ashkin and his colleague J. M. Dziedzic write, "We have used the laser

light trap as 'optical tweezers' for moving live single and multiple bacteria while being viewed under a high-resolution optical microscope." Tudor N. Buican, at the Life Sciences Division of Los Alamos National Laboratory in New Mexico, is able to use computer controlled optical tweezers to sort and move cells in an airtight container. David Clapham of the Mayo Clinic in Rochester, Minnesota, describes how optical tweezers could be used to gain new detailed information about the inner constitution of cells: "The microsphere can be coated with a compound that senses calcium, for example. The fluorescence of the bead would change to reflect local calcium concentrations.

(2) Scientists at E.I. du Pont de Nemours & Co. in Wilmington, Del., are learning how to take their own molecular building blocks and precisely control their change into crystal structures and macroscopic solid materials. A limitless number of new materials that would never occur in nature are expected to be the result. "If we can learn how to rationally control the space between the molecules, we may learn how to build new solids that are semiconducting, conducting, and superconducting," says Michael D. Ward of du Pont. Other products could be molecular-sized switches and wires for computers that would be a thousand times smaller and a million times faster than anything currently existing.

(3) Advance in atomic force microscope technology: In the March 24 *Science*, researchers from Stanford University and the University of California, Santa Barbara, write about a new type of ATM capable of imaging biological molecules even while in

motion. "We have always hoped that the power of scanning probe microscopes could be used to look at biological samples and benefit people," says Santa Barbara physicist Paul K. Hansma. "We're very excited that now it appears this will indeed be possible." A moving image has been made of the protein fibrin as it polymerizes into a sheet.

### Other Advances

(1) Air quality improves: According to the results of an EPA study issued in March, there was a significant improvement in the quality of the air in the USA between 1978 and 1987. Probably due to the phasing out of lead in gasoline, lead levels dropped 88% (19% in the last year), with carbon monoxide falling 32%. Choke on that, Eco-Gloomsters!

(2) Allen M. Hermann of the University of Arkansas in Fayetteville is adding to the excitement over the new group of high-temperature superconductors in which electrons carry the superconducting current. His new compound, consisting of thallium, barium, cerium, copper, and oxygen may raise the transition temperature for an electron superconductor to 85 kelvins.

(3) For the first time, physicists have succeeded in creating and containing a plasma made of positrons. Scientists at UCSD and AT&T Bell Laboratories used a trap of electric and magnetic fields combined with a nitrogen gas to slow the positrons down. The next step is to create a mixed plasma of electrons and positrons. This will be the first time a plasma has contained all particles of the same mass. Just a little closer to matter/antimatter engines to take us to the stars...

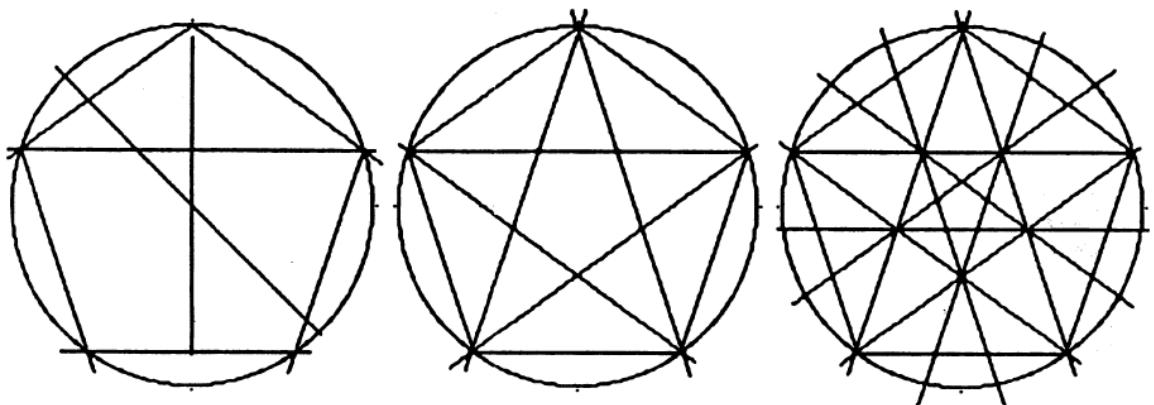
(4) Electronically conductive polymers should soon be available for large scale applications. Scientists at the American Chemical Society meeting in April reported advances in processing conducting polymers into usable films, fibers, and other shapes. The results will be anti-static coatings for clothes, airplane lightning protection, and screening of rooms from electronic surveillance.

(5) The Stanford Linear Collider recently produced its first Z particle (one of three carriers of the weak nuclear force). This is the first time that a Z has been observed to decay into a quark-anti-quark pair as theory had predicted.

(6) At the Materials Research Society meeting in San Diego in April, electrical engineer John A. Woollam reported success in being able to coat various optical materials with a thin film of hard, semi-transparent diamond-like carbon. Such a coating will eliminate reflection from semiconductor substrates and powerfully reduce reflection from diamond and other substances.

(7) Neural networks are being used to predict the outcomes of chemical reactions. This approach is still in its early stages, but impressive results have been obtained from a network with three layers of units. The network proved itself in tests regarding electrophilic aromatic substitution reactions.

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1989 Guide to Unusual How-To Sources.  
Describes 50 periodicals & handbooks on  
backyard tech, camping, crafts, finding new  
friends, gardening, home education, low-  
cost shelters, travel, unusual science. All  
addresses are included. Free for SASE. Light  
Living, POB 190-ez, Philomath, OR 97370.



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