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EXTROPY #6

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EXTROPY is a journal of ideas, dedicated to discussing and developing themes in the following areas: Life extension, immortalism and cryonics, artificial intelligence (AI), cognitive science and neuroscience, intelligence-increase technologies, nanotechnology, memetics, space colonization, uploading, spontaneous orders (free markets, neural networks, evolutionary processes, etc), science fiction, extropic psychology, futurist morality, reviews, transhumanism, and futurism.

EXTROPY is published twice a year by Tom W. Bell and Max More. Edited by Max More. All subscriptions and any writings or letters can be sent to EXTROPY, P.O. Box 77243, Los Angeles, CA 90007-7243. Home phone: (213) 746-5571. E-Mail to: CompuServe: 76436,3157

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Back issues available:

#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, Psychochemicals, Extropic Psychology, Morality, Mindfucking, Space Colonization, Libertarian Economics and Politics, Memetics, and Aesthetics; "Morality or Reality," by Max O'Connor. 24 pages. Available for $1.50.

#2 (Winter 1989): "Review of *Mind Children*," by Max O'Connor; "Darwin's Difficulty," by H. Keith Henson and Arel Lucas; "A Truly Instant Breakfast," by Steven B. Harris M.D.; "Wisdomism," by Tom W. Bell; "Nanotechnology News" by Max O'Connor; "Weirdness Watch," by Mark E. Potts. 32 pages. Available for $1.50.

#3 (Spring 1989): [Note: This issue contained articles out of our usual area.] "Love As A Contractual Relation," by Tom. W. Bell; "Love As A Sharing of Values," by Max O'Connor; "Agapeic Love," by Rob Michels; "Sexual Information," by Tom. W. Bell; "Psychedelics and Mind-Expansion," by Max O'Connor. 36 pages. Available for $1.50.

#4 (Summer 1989): Forum; "In Praise of the Devil," by Max O'Connor; "Neurocomputing," by Simon D. Levy; "Why Monogamy?" by Tom. W. Bell; "What's Wrong With Death?" by Max O'Connor; Reviews of "Are You a Transhuman?" by Mark E. Potts and Max O'Connor; "Postscript to `Morality or Reality,'" by Max O'Connor; "Efficient Aesthetics," by Tom. Bell; Intelligence at Work: Advances in Science" by Max O'Connor. 44 pages. Available for $2.

#5 (Winter 1990): Forum: "Art and Communication"; "Leaping the Abyss," by Gregory Benford; "Arch-Anarchy," by A; "Deep Anarchy," by Max O'Connor; "I am a Child," by Fred Chamberlain,"; "Perceptrons," by Simon D. Levy; "On Competition and Species Loss," by Max O'Connor; "A Review of Intoxication," by Rob Michels; "Intelligence at Work," by Max O'Connor and Simon D. Levy; "Extropian Resources," by Max O'Connor and Tom W. Bell,"; "The Extropian Declaration," by Tom W. Bell and Max O'Connor; "Our Enemy, `The State'," by Max O'Connor and Tom W. Bell. 52 pages. Available for $2.50.

Future issues: #7 (February/March 1991): Articles likely include "Order Without Orderers," "Man-Machine Fusion," "The Singularity," "Futique Neologisms," "Neurocomputation Part 4," "Free Law," reviews of Dyson's *Infinite in All Directions*, and Pelton's *Mind Food and Smart Pills*.

Letters, articles, and contributions to the Forum are always welcome. Submissions can be typewritten, though preferred format is on disk, in WordPerfect 5.0 or 4.2, or DOS text files (preferably saved in Generic WP); also acceptable are WordStar 4.0 or 5.0, Microsoft Word (IBM or Mac). 3.5" disks are better, though I can convert from 5.25". You can also try sending files to me via CompuServe (though I have yet to find out how this works!).

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EDITORIAL

Max More

CHANGING TIMES

This issue is appearing about six months after #5, and so is just about on time despite reorganization of personnel. Tom W. Bell, the editor and designer until now, has been busy working for the Institute for Humane Studies encouraging the growth of libertarian ideas, and is now starting law school. He will continue as co-publisher. Thank you Tom, for making EXTROPY an appealing and infectious "zine.

I am taking over as editor and designer as of this issue. I will try to keep EXTROPY coming out twice a year, though don't be surprised if #7 is late: I be will hard at work on my Ph.D dissertation (in philosophy) and will be focusing on the last of the Advanced Exams in January. If you write and don't get an instant response, please be patient. I now have E-mail, and E-mailed messages are more likely to receive quick responses.

Another change that should be mentioned is my name change. I am no longer "Max O'Connor". I've changed my name to "Max More" in order to remove the cultural links to Ireland (which connotes backwardness rather than future-orientation) and to reflect the extropian desire for MORE LIFE, MORE INTELLIGENCE, MORE FREEDOM. Please note: I will be unable to cash checks in my new name until October, so make them payable to "Max O'Connor" until then. Several people have been adopting new extropian names recently - sometimes unofficially. If you don't particularly like your given, unchosen name, why not think of a new one that better reflects your self-conception? As extropians pursuing self-transformation it is appropriate that we should choose new personal labels - one's that reflect what we feel to be important to us.

Please note the new address for submissions, and the new subscription rates. We have had to raise the rates to $3 per issue since the publishers have been making increasing losses on each issue. With circulation now exceeding 200, enough is enough!

Finally on changes: submissions for publication are preferred in either WordPerfect, Generic, or DOS Text, or you can E-Mail them to my CompuServe address. If you have an idea for an article, but are unsure whether we can use it, phone or write and we can discuss it. I'm especially looking for someone to write about the impications of advanced artificial reality for our understanding of what is real, and to discuss how it might benefit our lives.

SUGGESTIONS WANTED

MP-Infinity and Walter Vannini (aka Transinfinity Plus) have made suggestions for an extropian music collection. If you know of pieces of music that represent extropian values (as presented in the Principles in this issue) please let me know. It's hard to find music that promotes intelligence, life extension and immortality, self-transformation, dynamic optimism, and so on. An example of what I'm looking for is "Forever Young" - versions by Alphaville and Laura Brannigan. Apart from music I'd like to collect together extropic speeches, such as the concluding inspiring praise of intelligence and exploration from *The Shape of Things to Come*.

Elsewhere in this issue you will find an ad for EXTROPY T-shirts, one designed by Tom and one by myself and Simon! Levy. I welcome suggestions for more shirts with new logos, slogans, and designs.

New dating system: Extropians like to make changes, whether to their names, their identity, their lifespan, or their experiences. It would therefore be appropriate to come up with a new dating system to replace the Christian one. To avoid confusion we may have to use it in addition to the old system, but at least having a new one would help to keep extropian values in people's minds. I'm looking for suggestions for a base date.

One possibility is to date from the publication of Bacon's *Novum Organum*, which established the scientific method and made possible vast growth in science and technology. Since Bacon's masterwork was published in 1620ce, 1990ce would be 370ano (after *Novum Organum*). Alternatively, the publication of Newton's *Mathematical Principles of Natural Philosophy* (*Philosophae Naturalis Principia Mathematica*) in 1687 sparked the explosion of advancement in physics and science generally. Newton included a section in the Principles to methodology, a subject vital to the success of the scientific enterprise, just as private property rights were essential to the industrial revolution that, not coincidentally, took off at the same time as science.

EXTROPIANISM AND VENTURISM

The Society for Venturism is a philosophical organization dedicated to promoting the ideas and values of cryonics and physical immortality. I regard it as a subset of

extropianism. I have been a member for some time and was recently elected Vice President and Media Spokesperson for the Venturists. I hope that cooperation will develop further between the Venturists and the extropians. I recommend their monthly newsletter (see Extropian Resources). If you would me to talk on a local radio or TV station about cryonics, feel free to give them my address and phone number. I'd like to thank MP-Infinity for getting me on an hour long talk show on KTOK. The host was quite hospitable and none of the questioners were hostile.

At a recent Venturist gathering, three time capsules were buried, heading for the years 2040, 2090, and 2240. Each one of them carried a copy of EXTROPY. The time capsules will (probably in a year or two) be incorporated into a building in the proposed cryonics community in Perris, California (where the Alcor Foundation is planning a new facility for 1991).

THIS ISSUE

My article, "Transhumanism: Towards a Futurist Philosophy" examines the way in which complex systems of value commitments and broad perspectives provide enhanced meaning and worth to our lives. I argue that religion does this but at terrible cost in ignorance and stagnation. I propose the replacement of religion by a rational and extropic transhumanism. Transhumanistic philosophy will continue to be developed in EXTROPY in coming issues. Once my Ph.D is out of the way, I hope to complete a book on the topic, tentatively titled: *Technologies of Transformation: A Futurist Philosophy*. The essence of the extropian version of transhumanism is presented in the Extropian Principles, modified and reprinted in this issue. Feel free to copy and distribute this to whoever may be receptive. Separate copies are available for $0.25 each.

Tom's "Free Law" was to appear in this ussue, but is postponed until next time to allow further development. The possibility of a non-statist society is further explored in David Friedman's *The Machinery of Freedom*, reviewed by Rob Michels (who I'd like to congratulate on entering graduate school in philosophy.

Prolific extropian writer MP-Infinity explains why the age of the humanities is over in "The Opening of the Transhuman Mind" and reviews Joe Haldeman's immortalist and libertarian SF novel *Buying Time*.

Simon! Levy continues his illuminating series on neural networks and connectionism, an area of research that holds out the promise of understanding and improving on the complexities of human cognition. More information about the possibilities of neural networks and neurocomputation can be found in my review of Paul Churchland's brilliant book *A Neurocomputational Perspective*. Simon also reviews Prigogine and Stengers' *Order Out of Chaos* - part of the recent enormous burst of interest in and research of how complex systems can evolve from chaos, bursting the bonds of entropy, without design or central control.

"Extropy" - the process of increasing intelligence, information, usable energy, life, experience, and growth. "Extropianism" - the philosophy that seeks t promote these goals. The Extropian Principles are: **(1) Boundless Expansion; (2) Dynamic Optimism; (3) Self-Transformation; (4) Intelligent Technology.**

Mike Price's "The Thermodynamics of Death" gives us reason to believe that the extropian project of infinite and unending progress and expansion need not be limited even by the supposed heat death of the universe vastly far in the future.

Finally, A, Tom, and myself argue about infinity and other things in the Forum. The updated and expanded Extropian Resources list completes the issue.

open door to possibility picture here

Front cover: Designed by Max More. Thanks to Simon! Levy and Mike McHugh for ideas and computer graphics assistance. Back cover: Variations on the EXTROPY logo.

Transhumanism

Towards a Futurist Philosophy

by Max More

Religion, Humanism, and Transhumanism.

Humanity is in the early stages of a period of explosive expansion in knowledge, freedom, intelligence, lifespan, and control over experience. Yet the race persists in old conceptual structures which hold us back. One of the worst of these is religion. In this essay I will show how religion acts as an entropic force, standing against our advancement into transhumanity and our future as posthumans. At the same time I will acknowledge the necessary and positive role that religions have played in giving meaning and structure to our lives. The alternative to religion is not a despairing nihilism, nor a sterile scientism, but a transhumanism. Humanism, while a step in the right direction, contains too many outdated values and ideas. Extropianism - the form of transhumanism being developed here - moves beyond humanism, focusing on our evolutionary future.

Before launching the discussion it will be helpful to distinguish between the notions of humanism, transhumanism, posthumanism, religion, reliberium[1] or eupraxophy[2], and extropianism, all of which have something in common[3]. Briefly, reliberium derives from roots meaning "to free again", in contrast to religion which derives from roots meaning "to bind again". Both attempt to provide a context of values and understanding capable of bestowing or increasing the meaningfulness of our lives. However religion, as its roots imply, does this by tying its adherents to a particular set of doctrines in such a way that questioning of its tenets is discouraged.

The essence of any **religion** is faith and worship. Generally religions hold that there is a god or gods which give our lives meaning by assigning us a role in a grand plan created and controlled by external supernatural forces. Our assigned function is to obey and praise these forces or entities. However, the *essence* of religion is faith and worship rather than any belief in a god. A **reliberium** or **eupraxophy**, by contrast, plays a similar fundamental role in that it is concerned to create or increase meaningfulness, but it is opposed to faith, dogmatism, ideological authoritarian, and stagnation.

Reliberium is a broad concept which includes humanism, transhumanism, posthumanism, and extropianism. **Humanism** is a reliberium or philosophy of life that rejects deities, faith, and worship, instead basing a view of values and meaningfulness on the nature of humans and their potentials given rationality and science. **Transhumanism** is similar but recognizes and anticipates the radical alterations in the conditions of our existence resulting from various sciences and technologies such as neuroscience and neuropharmacology, nanotechnology, artificial ultraintelligence, space habitation, and so on.

Posthumanism will develop from transhumanism; its formulation will probably not be possible before the late 21st century. Finally, **extropianism** is the particular version of transhumanism that is being developed and refined in this journal. The extropian philosophy affirms the values of Boundless Expansion, Self-Transformation, Dynamic Optimism, and Intelligent Technology.[4]

Why Does Religion Persist?

Many people find it puzzling and frustrating that religion has persisted despite enormous advances in scientific understanding. In order to see why this has been the case and what the future holds for religion, we need to determine the causes of religion[5]. I suggest that there are four basic causes: Religion is (a) a pre-scientific system of explanation and technology; (b) a source of meaning, direction and emotional expression in life; (c) a means of social control; (d) a result of the structure of the brain in preconscious humans.[6]

I will comment on (c) and (d) briefly, since I want to focus on (a) and (b). Understanding religion as a form of social control and domination probably has little value as an explanation of its *origin* since religious belief had to exist before it could be used to this end. But it is plausible to think that religion has been fostered and developed by priests and state authorities in order to consolidate power over their subjects. If you can convince people that your authority derives from God or gods you will be in a stronger position than a merely secular authority[7]. This is illustrated by the historical record which shows that state authority and religious authority have been held in the same persons; this is still true in many less developed cultures, such as that of Iran. The entropic forces of religion and 'state' have synergetically boosted one another. For instance, 'the divine right of kings' means that King could do no wrong in law (or morals). Derived from this principle is the current policy of

immunity of government agents in performing their functions.

Marx and Engels took essentially this view. They saw religion as part of an ideology that rationalized the position of the ruling class, teaching subjects the virtues of meekness, humility, obedience, non-resistance, and non-retaliation. They saw this as inevitable until social conditions resulting in alienation and unhappiness were changed, making religion unnecessary as an "opium of the people". While there is some truth in this view, it ignores the radical and disrupting nature of some religious movements and undervalues the role that religions have sometimes played in undermining statist powers. Religion has occasionally provided a rival authority rather than a collaborative one.

I will only briefly mention Julian Jaynes' view that religion may have had its source in the structure of the brain. His idea is that humans only truly became conscious (and not just *sentient*) about 3000 years ago. Before that, events would trigger "voices" or "visions" in the right brain; these were communicated to the left brain (Broca's area, Wernicke's area, and the supplementary motor area) where they told the person what to do. Examples of this bicameral cognition can still be found in schizophrenics. Jaynes believes this is the origin of "religious experiences" such as seeing or hearing divine beings.

EXPLANATION AND CONTROL: Humans (and transhumans) are marked by a persistent desire to understand and control their environment and experience. Before the development of the scientific method, deductive and inductive logic, game theory, sophisticated epistemic principles and so on, humans resorted to superficial causal explanations based on observation for common phenomena, and theistic explanation for unusual events.[8] Deities were invoked to explain unusual or destructive phenomena, and to try to provide a comforting model of the uncertainties and uncontrollable events in life. Storms, floods, tornados, earthquakes, epidemics and madness could not be tolerated without some belief about their cause. In the absence of scientific explanation a religious or theistic explanation was almost inevitable.

Along with pre-scientific attempts at understanding came a crude attempt at a technology. A tension is evident here: On the one hand religions have frequently declared events to be determined by a divine plan and so have held attempts at changing things to be futile (this is common in Eastern religions, as well as other religions which include predestination). On the other hand, religions have offered certain limited and carefully circumscribed means of changing and controlling events, such as through prayer, ritual, and magic. The overall result has been entropic and anti-progressive since religious technology is ineffective (with the occasional exception of psychosomatic effects).

The role of religion in providing explanations, however poor, of human life and its environment has given way over time to the superior resources of empirical science. Science has been able to explain an enormous variety of

classical head with beam

phenomena, both commonplace and unusual. Protestations by theists that science has not and cannot explain the origin of life, the origin of the universe, or the nature of consciousness are increasingly ridiculous as we continue to learn and discover.[9]

An objection to this view of the origin and strength

of religion is that it is unclear why religion is persisting and even growing as scientific triumphs abound. This objection makes two mistakes however. First, as I am showing, there are other sustaining causes of religion that do not entirely or closely depend on the development of science. Second, the apparent strength and resurgence of religion is, I believe, an illusion generated from a limited perspective.[10] Certainly religion is not declining *rapidly*, and is continually taking new forms (such as New Age mysticism), but seen over a span of decades and centuries the trend is clear enough. Late twentieth century religion is very much less powerful than religion in the Middle Ages. In the past religion dominated all aspects of life and the idea of a separation of Church and state would have been considered incomprehensible and wicked.

The illusion is strong in North America, where TV evangelists have benefitted from modern media exposure. A higher and louder profile does not necessarily mean that religion is actually more powerful. Europeans see the decline of religion more clearly. The numbers of people attending churches, and the strength of religious conviction have declined drastically. It is a notorious fact that a high percentage of priests and ministers themselves have weak or non-existent beliefs. As science continues to squeeze out religion from its role in explanation, this factor in the persistence of religion will weaken. Just as important as the development of science in weakening religion is the scientific *education* of the population - something which is extremely poor in our monopolized and primitive state schools.[11]

exploding space picture

MEANING AND EMOTION: For psychological health and strength humans need to have metaphysical and existential beliefs capable of endowing their lives with a sense of meaningfulness. Religion does a fairly effective job at this, especially considering the falsity of its tenets. Religion is most effective in bolstering the psychologically weak - those who find life a burden: "You have a friend in Jesus". So long as you obey the rules and believe you will rewarded; you needn't be too concerned at being a loser. Religion operates as a philosophical band-aid, sheltering weak selves, but it is poor at positively promoting individual and social evolution. In being part of another's grand plan one gains the illusion of meaningfulness, even if it is the kind of meaningfulness the peasant felt under feudalism.[12]

By providing a complexly structured myth religions add drama to life, provide usable moral categories, and allow the expression of emotions unique to humans, such as metaphysical joy, love of abstract principle, and identification with deep values outside the self. One of the most gripping of religion's appeals is its ability to allow the feeling and expression of these powerful and transcendent emotions. An isolated self can neither express itself nor actualize and connect to broad values. By "letting in the holy spirit" or some other link to a divine being or force, one steps beyond the confines of one's self as it is and connects into a meaningful condition. This feature of religious belief is related to its explanatory role since the being or forces which provide the meaningful structure also have important effects - such as creating, sustaining, structuring, and destroying humanity, the planet or the universe.

Ludwig Feuerbach[13] explained how religion conceives "God" and gods in anthropocentric terms. "Man - this is the mystery of religion - projects his being onto objectivity, and then again makes himself an object to this projected image of himself." (p.29). Feuerbach characterizes God as the self-consciousness of man freed from all discordant elements. Looking beyond ourselves *as we are* is a good thing, but *externalizing* our values is both alienating and an abdication of responsibility. As I will explain below, transhumanism focusses not on an external state of current perfection (as imagined by us with our near-primitive minds) but on a internalized process of growth and expansion taking us into the future.[14]

As a strategy (generally unconscious) to create meaningfulness, religion is a failure. This is only partly because it is based on ignorance or rejection of evidence and rationality. Even if reality contained the entities and forces claimed to exist, any remotely objective meaning would be absent.[15] What kind of role in a divine plan could endow us with meaning? Being a trivial element of a plan would not satisfy us. We want to be near the center of the plan and to play an important and positive role. "If the cosmic role of human beings was to provide a negative lesson to some others ("don't act like them") or to provide needed food

to intergalactic travelers who *were* important, this would not suit our aspirations...The role should focus on aspects of ourselves that we prize or are proud of, and it should use these in ways connected with the reasons why we prize them." (Nozick. p.586-7). Even this would not be sufficient. Fulfilling our role in the plan might require our voluntary compliance, or it might be imposed on us. If it is our choice, we may have no good reason to cooperate. In either case it's unclear how fitting the plan could give us meaning. Even if it did give us *meaning* it may not be *good* for us. A further problem arises when we ask what it is that gives God's purposes meaningfulness; I refer the reader to Nozick for a tale concerning God's crisis of meaningfulness.

Religion as Entropic

The urgency of the need to replace religion with another form of meaning-fostering system is all the more evident when we think of the inherent irrationalism of religion and its entropic retardation of progress.[16] As I have noted, essential to religion is faith. This does not mean a rational, pragmatic decision to adopt a hypothesis; faith, in the pertinent sense, means a fixed belief which persists in the face of contrary evidence. As I stressed in my "In Praise of the Devil" (EXTROPY #4), hostility to reason may be explicit (as in Luther) or it may be revealed only after some probing of beliefs. This is true not only of traditional religions such as Christianity and Islam, and their offshoots such as Mormonism, but also of the diverse variants on New Age mysticism. Those who believe in astrology, crystals, angelic forces, and guiding aliens are not interested in evidence or plausibility.

Irrationality, the rejection of our best means of cognition, is necessarily dangerous and entropic. Entropy - the loss of order, information, and usable energy, is promoted by faith. *Extropic* values of increasing intelligence, freedom, enjoyment, longevity, and expansion can only be achieved by the most scrupulous employment of reason, science, logic, and critical thinking.

Apart from subverting extropic progress, the irrational faith of religion encourages an attitude of resignation. Why bother to try to improve one's lot if it's "God's Will" or "The Cosmic Plan"? On the one hand believers cannot take badness and evil seriously: Given the existence of perfect goodness and power, the bad aspects of life must be illusory, or unimportant compared to the afterlife. On the other hand, religious beliefs are usually accepted because of the person's pessimistic, hopeless view of the human situation (or their personal condition). The surface contradiction is eliminated when we see that the overall view is of a tragic human condition made bearable by a separate realm of divinity, salvation, and paradise.

Where religion offers faith in the invisible and unknowable, transhumanism embodies the extropic principle of *dynamic optimism*. Unlike faith's unquestioning belief in a superior realm to be bestowed on us through divine agency, dynamic optimism is an internally generated motivation for progress. It an attitude that looks at evidence, trends, and capacities, but goes beyond them (not *against* them) in setting inspiring goals in order to empower us to move forward, upward, and outward. It says (literally!): "Never say die". Our goals and direction for the future are not rigidly determined by what we think we know now, since what we understand and what we can accomplish increases daily. Dynamic optimism makes full use of our current understanding and abilities and directs us to move beyond them. The extropian rejects the common culture of negativity, the focus on negatives, the defence of stagnation and tradition, and advocates a surging forward into a bright future.

The extropian striving for something better than what we have exists in religion in an irrationalist-fantasy form, in which a superior existence is *given to us* by a divine force, an existence only truly accessible after our physical death and decay. Locating "Paradise" in another realm removes from us the necessity and point of taking responsibility for our condition by using reason and technology to transform it. Sometimes Paradise is located (perhaps temporarily) in this world, but it will be brought about by divine power and not by our own efforts. Religion says we need not and should seek physical immortality through life extension, biostasis and so on, since we are already guaranteed these in the afterlife. The Christian notion of salvation by the act of Jesus, rather than through our own restitution for wrongs and our self-transformation, can similarly result in moral hazard. Religion justifies complacency and stagnation. The religionist has no answer to the extropian challenge put by Nietzsche's Zarathustra: "I teach you the overman. Man is something that is to be overcome. What have you done to overcome him?"[17]

Nihilism

These defects are easy to overlook when it seems that the alternative is nihilism[18] - a belief in the absence of meaning and purpose. The nihilist view, as put by Peter Atkins[19] holds that "At root there is only corruption and the unstemmable tide of chaos." Nihilism says that there is no truth about the way things are; the world is valueless and purposeless. As Hans Kung puts it, nihilism represents itself "as insight into the nothingness, contradictoriness, meaninglessness, worthlessness, of reality."[20]

I will not explain what's wrong with nihilism in detail here.[21] I agree with Nietzsche (in *The Will to Power*) that nihilism is only a transitional stage resulting from the breakdown of an erroneous interpretation of the world. We now have plenty of resources to leave nihilism behind, affirming a positive (but continually evolving) value-perspective.

Briefly, for the assumption that there is "unity" (i.e., the view that there is some regularity to be discovered) and truth to be justified requires only a critical rationalism - that is, pragmatic and fallibilistic, but optimistic empiricism. If there are regularities then our best strategy for discovering them is a fallibilist but optimistic empiricism.

A reply to nihilism about value is more involved,[22] but essentially involves the observation that we are faced

with choices, alternatives, and have conflicting desires that call for ethical principles. There is no objective value; value is a product of consciousness. Our situation as conscious beings faced with choices demands that we adopt and continually refine and develop moral principles.

Transhumanism: Meaning as Expansionary Transcendence

Now that we understand the functions of religion, we can see that a narrow scientism will not succeed in replacing it. A deeply value-laden, yet open and critical system (or systems) will be necessary to dislodge virulent religious memes. The growth of humanism over the decades has begun this job, but now it is time to utilize the more inclusive and memetically attractive option of transhumanism.[23]

The extropian philosophy being developed and expressed in this journal is the most complete form of transhumanism so far.[24] It includes a broad metaphysical perspective on the development, direction, goal and value of life and consciousness. It goes beyond humanism by peering into the future in order to better understand our possibilities. As we move forward through time our understanding of our immense potentials will evolve; there can be no final, ultimate, correct philosophy of life. Dogma has no place within transhumanism - transhumanism must be flexible and ready to move on, reconfiguring into higher forms, new versions of transhumanism and, one day, posthumanism.

Extropian transhumanism offers a optimistic, vital and dynamic philosophy of life. We face a picture of unlimited growth and possibility with excitement and joy. We seek to void all limits to life, intelligence, freedom, knowledge and happiness. Science, technology and reason must be harnessed to our extropic values to abolish the greatest evil: death. Death does not stop the progress of intelligent beings considered collectively, but it obliterates the individual. No philosophy of life can be truly satisfying which glorifies the advance of intelligent beings and yet which condemns each and every individual to rot into nothingness. Each of us seeks growth and the transcendence of our current forms and limitations. The abolition of aging and, finally, all causes of death, is essential to any philosophy of optimism and transcendence relevant to the individual.

We can look up while on our knees, but we cannot walk forward.

Humans have tried to imbue their lives with a fuller sense of meaning by a belief in the possibility of connecting with a higher realm, by transcending their limitations and merging with or at least communing with the Infinite and Eternal. Apart from the sheer falsity and irrationality of religion it has had the unfortunate consequence (identified by Ludwig Feuerbach) of debasing humanity. By inventing a God or gods and elevating them above us, by making external divinity the source of meaning and value, and by abasing ourselves before these higher powers, we have stifled our own emerging sense of personal value. We can look up while on our knees, but we cannot walk forward.

The extropian philosophy does not look outside us to a superior alien force for inspiration. Instead it looks inside us and beyond us, projecting forward to a brilliant vision of our future. Our goal is not God, it is the continuation of the process of improvement and transformation of ourselves into ever higher forms. We will outgrow our current interests, bodies, minds, and forms of social organization. This process of expansion and transcendence is the fountainhead of meaningfulness.

What is meaningfulness and why is the extropian philosophy of transhumanism especially effective at nurturing and feeding it?[25] A static life, one which is closed up within itself and never seeks new values, never grows, never explores, is a life lacking meaning. If the universe were controlled by a malevolent being who frustrated all of your plans even before they could move you forward, you would be unable to connect with anything beyond your current condition. Even if you were free to plan and act, your life would lack much meaning if your long term plans reached no further than current narrow concerns (such as the pursuit of immediate gratification and the conditions for its continuance).

It will be clear why death undercuts meaning. The involuntary termination of life limits the ways of and extent to which you can connect your life to other values. People seek meaning by connecting with many different things and causes: Political and social causes of all kinds, having children, seeking beauty or knowledge, relationships with others, and self-development. We worry about lack of meaning when we ask ourselves “Is this all it comes to?”, “Is it merely *this*?”. We find more meaning as we realize the connections of our concerns to broader values, and as we become more intensely involved in these transcendent concerns.

No matter how broad the field of value we connect our lives to, we can intellectually step outside that field and ask ourselves “what does that come to? What does that mean?”. Even if the values we link to are themselves extremely broad and important it seems we can always stand outside that system of meaning and be concerned about its adequacy or its ultimate meaningfulness. The wider the field of the meaning-relations the more difficult and strained will be this questioning.[26] If, no matter how wide the realm with which we connect ourselves and our purposes, there is always a wider context from which to question meaning, perhaps what we require is a field of meaning that is unlimited and outside of which we cannot stand.[27] As Robert Nozick notes, “The intellectual life seems to offer one route across all limits: there is nothing that cannot be thought of, theorized about, pondered.”(597) However, though thinking can link us to everything, it is only one particular type of link. A meaningful life will involve more than

simply abstract consideration of values.

Humanity is a temporary stage along the evolutionary pathway. We are not the zenith of nature's development.

Meaning involves transcending limits, but transcending limits to connect with something trivial will not serve to provide meaning. For the transcendence of limits to bestow meaning, what we connect with must be valuable. The meaning of a life will be the structure of value with which it connects. If value is organic unity or a certain internal ordering,[28] the transcendence of limits involved in meaningfulness requires the breaking up of old orders, the demolition of stagnant unities. On one view (which Nozick identifies as the classicist) the point of transcending limits is to reach ever higher levels of value. The goal is the unifications, the new levels of value and ordering. An alternative view (the romanticist) locates the goal of the process in the destruction of the unities.

We need not choose between these views. Neither the construction of new orderings and unities nor their transcendence alone is what matters. The importance lies in the process of ordering-and-transcendence. The value of the process is in its alternating unification and transcendence. This alternation alone will not suffice; if the alternation was akin to Nietzsche's eternal recurrence, or Sisyphus' endlessly repetitive task, it would quite meaningless. The process of alternately creating and breaking organic structures can be seen as meaningful if it has direction.

Life and intelligence must re-order, transform and transcend its limits in an unlimited progressive process.

This is the core of the extropian approach to meaningfulness: Life and intelligence must never stagnate; it must re-order, transform and transcend its limits in an unlimited progressive process. Our goal is the exuberant and dynamic continuation of this unlimited process, not the attainment of some final supposedly unlimited condition. The goal of religion is communion with, or merely serving, God - a being superior to us. The extropian goal is our own expansion and progress without end. Humanity must not stagnate - to go backwards to a primitive life, or to halt our burgeoning move forward, upward, outward, would be a betrayal of the dynamic inherent in life and consciousness. We must progress on to transhumanity and beyond into a posthuman stage that we can barely glimpse.

God was a primitive notion invented by primitive people, people only just beginning to step out of ignorance and unconsciousness. God was an oppressive concept, a more powerful being than we, but made in the image of our crude self-conceptions. Our own process of endless expansion into higher forms should and will replace this religious idea. As extropians pursuing and promoting transcendent expansion we are the vanguard of evolution. Humanity is a temporary stage along the evolutionary pathway. We are not the zenith of nature's development. It is time for us to consciously take charge of ourselves and to accelerate our progress.

No more gods, no more faith, no more timid holding back. Let us blast out of our old forms, our ignorance, our weakness, and our mortality. The future is ours.

NOTES

1. The term 'reliberium' was coined by Tom W. Bell.

2. 'Eupraxophy' ('good practice' or 'active wisdom') was devised by humanist Paul Kurtz (see *Free Inquiry*, Winter 1987/88), and means 'philosophy of life' or 'life stance'. It is essentially the same as 'reliberium', though it is neutral on the question of whether the philosophy is freeing or constraining. It allows humanists (and transhumanists) to answer the question: If humanism (transhumanism) isn't a religion, what is it?

3. Or, as neurocomputationalists prefer to say, they share a high-dimensional activation vector space. See my review in this issue of Paul Churchland's *A Neurocomputational Perspective*.

4. See the Extropian Principles in this issue. I am in the early preparatory stages of writing a book on extropianism, tentatively titled *Technologies of Transformation: A Futurist Philosophy*.

5. Giving a causal explanation of religion does not, of course, amount to a refutation of its truth. My purpose in this essay does not include proving the falsity of religion. Excellent arguments against religion can be found in J.L. Mackie, *The Miracle of Theism*, Oxford University Press, 1982. Also recommended is George H. Smith's *Atheism: The Case Against God*, Prometheus Books, 1979.

6. I find this the most speculative of the four. It has been proposed by Julian Jaynes in his intriguing book, *The Origin of Consciousness in the Breakdown of the Bicameral Mind*.

7. However, secular authoritarians can substitute for God the authority of the Race, the Proletariat/History, or the

Collective.

8. A classic work on this topic is David Hume's *The Natural History of Religion*.

9. For secular thoughts on these issues see Richard Dawkins, *The Selfish Gene*, Freeman Dyson, *Infinite in All Directions*, and Paul Churchland's *A Neurocomputational Perspective*.

10. See Fm-2030's *Are You a Transhuman?*, pp.172-175 (Warner Books, New York, 1989).

11. For a free market alternative see, for example, *The Twelve-Year Sentence*, ed., William R. Rickenbacker, or *Privatization and Educational Choice*, by Myron Lieberman.

12. The communitarian movement in political philosophy appears to be a similar yearning for meaning by means of self-submergence.

13. In *The Essence of Christianity*, trans. by Marian Evans (Kegan Paul, London, 1893).

14. Hence the extropian exclamation: "Forward! Upward! Outward!" The corresponding religious exclamation might be: "Outside Us!"

15. For a more detailed discussion of this view, see Robert Nozick's incisive analysis in *Philosophical Explanations,* Harvard University Press, 1981, pp.585-594.

16. Many of the evils of religion are well expounded by George H. Smith in Parts Two and Four of *Atheism: The Case Against God*.

17. I intend to examine in depth the connection between Nietzsche's idea of the overman/ubermensch and the extropian vision of the transhuman in a future issue.

18. There are other possibilities which I have not the room to examine. An example would be the non-theistic view known as extreme axiarchism - see J. Leslie, *Value and Existence* (Basil Blackwell, Oxford, 1979). For an examination of extreme axiarchism see chapter 13 of Mackie (see note 4).

19. "Purposeless People" in ch.2 of *Persons and Personality: A Contemporary Inquiry*, eds. Arthur Peacocke and Grant Gillett, Basil Blackwell, 1987.

20. H. Kung, *Does God Exist?* (Collins, London, 1980) p.421.

21. See Mackie, ch.14.

22. See my "Morality or Reality?" in *EXTROPY* #1, and the "Postscript" in *EXTROPY* #4. In a future issue I may also develop a neurocomputational approach to moral progress and rationality. This doesn't require objective or intrinsic values, yet allows for non-arbitrary moral values and principles.

23. Transhumanism has started to gather in strength rapidly in recent years. Apart from extropianism, the is Venturism (and its new variant: The Order of Universal Immortalism), and loose clusters of ideas held by many immortalists, space enthusiasts and others.

24. Other books presenting aspects of transhumanist thought can be found in the reading list found at the end of the Extropian Principles elsewhere in this issue.

25. My discussion of the meaningfulness of life draws on Robert Nozick's excellent treatment of the topic in Chapter Six of *Philosophical Explanations*.

26. Extropians take this concern seriously. That is why we seek immortality and not just extended life. This also explains why in this issue there appears Mike Price's "The Thermodynamics of Death": Meaningfulness would be limited if there were no way to avoid the heat death of the universe.

27. For a critique of the idea that our goal should be an unlimited condition see my response in this issue to A's "Arch-Anarchy" (in *EXTROPY* #5). For problems with the idea of an unlimited being see Nozick, pp.600-610, 747-748, and George H. Smith, *Atheism*, ch.3.

28. See Nozick, ch.5:II.

Book Reviews

By Simon! D. Levy

THE EMPEROR'S NEW DUALISM

THE EMPEROR'S NEW MIND
Roger Penrose
Oxford University Press, 1990.
466 pages.

Reviewed by Simon! D. Levy

This book was disappointing. As its title suggests, *The Emperor's New Mind* takes a skeptical look at recent developments in artificial intelligence and attempts to show why computers are not, and will never be, as smart as people. Penrose believes that computers are *fundamentally* incapable of thinking like human beings. His argument, as I understand it, runs as follows:

(1) All artificial intelligence produced so far is based on *computable operations*. In other words, no matter how sophisticated as AI program is, it can always be reduced to a set of instructions on a simple serial computer (called a Turing machine).

(2) Recent developments in parallel distributed processing (*aka* neural network models) hold no more promise than serial processing models, since any neural network's operation can be described with a serial model. Hence despite advances in neural networks, point (1) is still valid.

(3) The brain's operation is *not* computable: What a brain does cannot be described by a set of instructions. Hence, brains and machines are fundamentally different.

(4) The non-computability of the brain comes from interactions at the sub-atomic level, where the strange, probabilistic laws of quantum mechanics hold sway.

There are two things wrong with this argument. First, point (2) completely ignores one of the most important things about parallel computation: It is *much faster* than serial computation. Now, you (and Penrose) might reply, "Well, who cares how long it takes to solve a problem, as long as you solve it?" Instead of answering this directly, I'll ask you to think about the problem of removing yourself from the path of an oncoming car. The point is that time is everything in biology. All of our experience, emotion, and thought is intimately tied up with various time scales and time cycles. What is really surprising is that in attempting to debunk the myths of traditional AI, Penrose seems to have fallen into the same trap that ensnared so many AI researchers, namely, mistaking identical end results for identical activities.

Second, I find Penrose's non-computability ideas especially pernicious. Point (3) is bad-ole-fashioned dual ism, plain and simple: The brain is so nifty that it can't be doing things in a deterministic, mechanical way! What makes *The Emperor's New Mind* different from your garden variety dualism is that Penrose places the magic at the level of quantum interaction. This may have something to do with the fact that he knows a lot about quantum physics. Although he does a good job demonstrating the non-computable behavior of the particles studied in that field, Penrose doesn't do nearly as well in showing how quantum weirdness relates to mental activity, so his quantum arguments remain more an analogy than a serious hypothesis about the workings of the brain.

So much for content. Stylistically, this book is tough going. Perhaps to prepare his readers for a quantum-level explanation of the brain, Penrose spends most of his book talking about modern physics in a way I found very difficult to follow. Some of the descriptions were fascinating, such as a passage in which Penrose describes what you would see if you were watching an astronaut entering a black hole. In general though, it was very hard for me to see what all the physics had to do with Penrose's basic hypothesis. Also, I couldn't see why nearly every physicist cited by Penrose had to have the epithet "brilliant" or "great" attached to his name. The work of Bohr, Einstein, and others stands for itself; no such pedestrian compliments are needed.

To conclude, I would not recommend *The Emperor's New Mind* to readers of EXTROPY. It is too long, too full of uninspired writing, and not terribly convincing.

EXTROPY, COURTESY OF ENTROPY.

ORDER OUT OF CHAOS
Ilya Prigogine and Isabelle Stengers.
Bantam Books, 1984.
313 pages.

Order Out of Chaos presents an intriguing hypothesis: The forces of disorder, forces that we consider so inimical to life, are what give rise to living things.

The book is divided into three sections. The first deals with the long-standing conflict between classical science on the one hand, and the mystifying complexity of nature, and especially man's position in nature, on the other.The section starts with a discussion of Sir Isaac

Newton, who was considered "The New Moses" by many of his contemporaries, because he revealed the "language of nature" to a benighted world.

Prigogine and Stengers do a good job of conveying the excitement that Newton's ideas (referred to as classical mechanics) unleashed. These ideas became the source of much dissatisfaction, especially on the part of philosophers such as Kant and Hegel. Both of these philosophers found the science of Newton, with its mechanical description of idealized physical interactions, too far removed from the everyday realities of nature and human existence. Especially troubling was the notion of *reversibility* inherent in classical mechanics. Reversibility means that the forward progression of time, as we perceive it, plays no role in the equations describing the behavior of moving objects: Given an equation expressing the position of the object at some particular time, we can predict the object's position at any time in the future, or retrodict its position at any time in the past. Neither we nor the equation cares about which direction time follows.

This conception of time runs counter to our experience: In the real world, spilled milk never spontaneously rises from the floor and jumps back into the bottle; a bullet never flies back into the barrel of a gun. In this sense, classical mechanics fails to describe what we perceive as the natural progression of events. The first section of the book concludes with a discussion of how this gap between Newton's and human experience led to the formation of "two cultures", the scientific and the humanistic, in Western thought.

The second section of *Order Out of Chaos* describes the birth of thermodynamics, the science of heat transfer. Thermodynamics provided physics with its first coherent formulation of non-reversible time. The Second Law of Thermodynamics, as formulated by Clausius, states that the entropy of the universe increases toward a maximum. In other words, the *natural* direction of things is from a useful concentration of energy toward a useless dissipation of energy, and the proces cannot be reversed.

Although thermodynamics represented a leap forward in man's understanding of the universe, the increase of entropy described by the Second Law left science with a puzzle: If the tendency of things is toward disorder how could the incredible complexity of nature ever have arisen?

In order to explain how this question is being answered, Prigogine and Stengers draw a distinction between systems near equilibrium and systems far from equilibrium. As Boltzman showed, a system near equilibrium can be described using probabilities. An example of such a system is a pot of warm water. The most probable state of the water is an even distribution of water molecules in the pot, with no one molecule behaving very differently from any other.

It is when a system moves to a condition far from equilibrium that things begin to get interesting. If we continue to heat our pot of water, it will eventually begin to boil. Boiling represents a state very different from the even distribution of molecules described by Boltzman. In a full, roiling boil, large numbers of molecules move together in a way that is highly improbable. Hence, the pot of boiling water may e said to contain information, by virtue of its being far from an equilibrium state. In light of this sort of process, the motivation for the book's title seems clear: The heat dissipation described by the Second Law suggests an ultimate state of disorder, or chaos, but the dissipation of heat may give rise to far-from-equilibrium conditions, which can produce order. I find this idea particularly appealing from an Extropian point of view, since it provides a rational alternative to creationist or mystical accounts of the origin of life. The authors give examples of far-from-equilibrium systems in physics, chemistry, and biology to show how order can arise spontaneously in different realms under the right conditions.

The third section of *Order Out of Chaos* further explores the re-introduction of directional time into science. Most intriguing is the author's discussion of whether irreversibility (and hence the Second Law) is an artifact of our observation. In other words, if we could look at things at a precise enough scale, maybe we could use classical mechanics to develop a reversible equation or equations to describe what is going on. Interestingly enough, most scientists have considered this to be the case (p.235). On the other hand, Planck, with whom the authors agree, considered the Second Law to be a fundamental property of nature, irrespective of the accuracy of observation.I had difficulty following the authors' argument on this point, but the issue is compelling and by no means resolved.

In general, I enjoyed this book and found it a challenge. After my second reading of it, I still don't think I've grasped many of the fundamental ideas that Prigogine and Stengers have outlined. The style of the book is engaging, and the authors manage to convey their belief in the importance of the ideas they discuss, not just for science, but for our understanding of "life, the universe, and everything," to borrow a phrase from a less serious work. I've glossed over many of these ideas, particularly those concerning instability and fluctuations, which are common in discussions of far-from-equilibrium systems.

I might add that you can learn a lot from *Order Out of Chaos* without reading the whole book. The second section gives a nice overview of self-organization, which should be of particular interest to EXTROPY readers. So whether you want to gain some insight into the big issues, or just want to have some background for understanding what's going on in the emerging field of self-organizing systems, *Order Out of Chaos* is a good investment.

The Opening of the Transhuman Mind

by MP-Infinity

I am convinced that in a few hundred years the words of Shakespeare...will interest us no more than the grunting of swine in a wallow...Not only will his work be far too weak in intellect, and written in too vague and puny a language, but the problems which concerned him will be, in the main, no more than historical curiosities. Neither greed, nor lust, nor ambition will in that society have any recognizable similarity to the qualities we know. (Ettinger 1964: 156.)

While recently reading *The Closing of the American Mind*, Allan Bloom's notorious indictment of American education, I was struck by a fundamental weakness in his argument for the traditional Western paideia. Namely, Bloom assumes that humans have always been and will remain the same indefinitely.

For some examples, consider Bloom's assertions that (my emphasis) "What each generation is can be best discovered in its relation to the permanent concerns of mankind;" "There is, of course, literature that affects a generation profoundly but has no interest at all for the next generation because its central theme proved ephemeral, whereas the greatest literature addresses the permanent problems of man;" and, Man has always had to come to terms with God, love and death" (Bloom 1987: 19, 108, and 230 respectively).

While to an ordinary person these ideas may seem self-evident, to an extropian they simply will not do. Not only does Bloom promote an anti-Darwinian view of the human past (humans having evolved from organisms incapable of abstract thought), but he also completely ignores the extropic scenario where we can transcend our current selves through technology. The prospect of trans- and posthumanity will radically transform the kinds of art we potential transhumans will find satisfying.

To help my discussion, I shall borrow Ayn Rand's definition that "Art is a selective re-creation of reality according to an artist's metaphysical value-judgments" (Rand 1971: p.19). Current art, which reflects the value-experiences of mere human beings, is properly called the `humanities.' Because for millennia humans have struggled for survival in highly entropic environments, the humanities bear the scars of Ignorance, State, Religion, and Death. Even at their best they promote entropy. For example, Schiller's poem "An die Freude," sung in Beethoven's otherwise exalting Ninth Symphony, paradoxically celebrates joy and advocates groveling before "God" in the same context.

Numerous other examples could be given, but the point is that the humanities are a heritage of adulterated quality which we shall eventually have to abandon as we rise to transhuman status. They do not and cannot embody the value-experiences of the transhumans we wish to become, simply because we will no longer have simply human problems. Even now our extropic thoughts and emotions are outgrowing the satisfactions provided by traditional art. Perhaps without knowing it we are looking for the 'transhumanities', which we are only beginning to create.

Before suggesting what sorts of values the transhumanities might teach, it must be emphasized that this rather theoretical discussion has practical consequences. Specifically, cryonicists have been struggling against the cultural inertia induced by the example of the 'Mythic Hero' in the humanities. Supposedly only the Mythic Hero can conquer death, and only for himself and a few followers (Harris 1988a: 20-28). Because most people refuse to view themselves as heroic, in accordance with the humanities' teachings, they consequently refuse chances for self-acquired immortality. It has been proposed to co-opt the mythic hero into cryonics by freezing a well-known and respected person, but the chances of this happening soon are small (Harris 1988b: 14-15).

A more rational counter-proposal is to democratize the Mythic Hero. Under this plan everyone who chooses cryonic suspension would become heroic. It is not clear whether such a transhuman mythology could be made competitive with the deeply entrenched human mythology, though the history of feminism, which challenged male-dominated myths, offers some suggestive parallels (Donaldson 1988: 35-36). Nevertheless the unquestioned authority of the humanities is killing people through perpetuation of deathist models of 'right' behavior.

In spite of this deathism-through-example, the art scene is not totally hopeless. Glimpses of proto-transhumanities may be found in the novels of Ayn Rand, Robert Heinlein, Vernor Vinge, and others; in the motion picture *Things to Come*, *Cocoon*, and the January 4, 1990 episode of *L.A. Law*; and in illustrations of outer-spacial exploration and living. (EXTROPY readers are free to offer additional examples.) The dominant values of the transhumanities seem to be exhilaration over the prospects of endless growth in life, freedom, happiness, pleasure, intelligence, success, competence, wealth - in short, all the things extropians want, and more, more, more!

But we are only at the dawn of the transhuman era. Barring a catastrophe, this age will rapidly mature into the posthuman Singularity as our powers grow without bound. Who can foresee what we will find meaningful then?

A brief tour of the wonders ahead may be experienced vicariously through Marc Stiegler's story "The Gentle Seduction". Perhaps certain readers may identify with the simple female character who fears change yet allows herself to grow into a superbeing of unimaginable complexity - artistically a case of the average person attaining superheroism (Stiegler 1989: 10-34).

Ultimately if the extropic Weltanschauung is to spread, the artists among us will need to create more and better art in this genre to lead people towards increasingly extropic goals. It is not enough to be intellectually correct - we must be emotionally, morally, and aesthetically engaging if we wish to maximize our own chances for aeonic life. The challenge is to open the transhuman mind in as many people as possible - a 'gentle seduction' into improvement without end.

POSTSCRIPT: A few days after I mailed Max my essay on the transhumanities, I belatedly received the Fall 1989 (#7) issue of Mondo 2000 - a magazine of very uneven quality, I must say. Nevertheless, one of the best articles in that issue is "Hurtling Towards the Singularity", an interview with Vernor Vinge conducted by Michael Synergy. Condensing some of his thoughts on art relevant to my essay, Vinge argues that:

When a race succeeds in making creatures that are smarter than it is, then all the rules are changed. And from the standpoint of that race, you've gone through a Singularity. That's because it's not possible to talk meaningfully about the issues that are important after that point...

So I have found a big barrier in writing hard science fiction. When I try to do a hard science fiction extrapolation, I run out of humanity quickly...

...I personally think, if we don't blow ourselves up that, in twenty to a hundred years, we will go through this technological Singularity. And that there may be humans afterwards - they will not be the principal players - and it's essentially impossible to talk about what's going on with them. So to me, that's the hard reality... So, I think that all writers who intend to write realistically are up against the same wall. And it is producing a lot of real neat stories. Real pyrotechnics. But there really are some limits there, until we actually fall through the Singularity, and then their art, presumably, can continue, but it would not be the art that you or I, at this time, could understand.

Clearly Vinge thinks we would find "Singularitarian" or posthuman art incomprehensible. But this incomprehension is asymmetric. Posthumans, and especially those evolved from current cryonicists, would probably understand human art - but they (and, optimistically, we) will find it boring, trivial, or childish, much as adults tire of the Santa Claus stories which captivate children.

Thus the Singularity will mark a sharp discontinuity in the history of art, resulting from the appearance of superhuman intelligences on this planet. But, as Vinge complains, creating meaningful transhuman art for the pre-Singularity period is extremely difficult because we cannot expect to remain human for very many more decades!

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limits to

THE EXTROPIAN PRINCIPLES

by

Max More

1. BOUNDLESS EXPANSION - seeking more intelligence, wisdom, and personal power, an unlimited lifespan, and removal of natural, social, biological, and psychological limits to self-actualization and self-realization. No limits on our personal and social progress and possibilities.

2. SELF-TRANSFORMATION - both moral and cognitive: critical examination of all assumptions and models. Taking charge of one's own life. Biological and neurological augmentation. Social conditions for self-transformation include spontaneous order: rejection of central control and maximum sustainable freedom. Fostering of diversity and exploration of possibilities.

3. DYNAMIC OPTIMISM - promotion of a positive, empowering attitude towards our individual future and that of all intelligent beings.

4. INTELLIGENT TECHNOLOGY - affirmation of the role of science and its offspring, technology, guided by extropian values, in realizing the optimistic, dynamic value-perspective of extropianism.

These principles are further explicated below, and their full meaning and application is developed in EXTROPY.

1. Boundless Expansion.

Beginning as mindless matter, nature developed parts of itself in a slow evolutionary development which produced progressively more powerful brains. With the advent of the conceptual consciousness of humankind the rate of advancement sharply accelerated as intelligence and technology could be applied to our condition. We seek to promote the continuation and guidance of this process, transcending biological and psychological limits into posthumanity.

In aspiring to transhumanity, and beyond to posthumanity, we reject natural and traditional limitations on our possibilities. We champion the rational use of science and technology to void limits on lifespan, intelligence, personal power, freedom, and experience. We are immortalists because we recognize the absurdity of accepting "natural" our lives. We support biomedical research with the goal of understanding and controlling the aging process. We are interested in any plausible means of con
quering death, including interim measures like biostasis/cryonics, and long-term possibilities such as duplication of the self and storage in a computer memory bank for later re-embodiment.

We seek out and support guided development of anything that could augment our abilities and freedom: Biological and neurobiological modification; leaving Earth - the womb of human and transhuman intelligence - and the exploration and inhabitation of space; expansion of our intelligence beyond the limits of our current brains; and an ever-developing wisdom, are also what we intend by technological transcendence of humanity. No mysteries are sacrosanct; the unknown will yield to the intelligent mind. We seek to understand and to master reality up to and beyond any currently foreseen limits.

2. Self-Transformation.

We affirm reason and reject blind faith. Religion, based on systematized irrationality, is rejected. Other knowledge gathering processes are assessed on their merits and checked by reason and evidence. For example, "mysticism" might include some means of coming to know things which are not easily accessible through other means; if so this purported knowledge should be held accountable to known rational procedures. Our commitment to reason, therefore, does not imply a principled rejection of non-logical or nonconscious processes.

Self-transformation means our decision to re-examine our values, beliefs, and natures. To be willing to experiment with ourselves in the quest for transhumanity, without expecting others to fit into our plans. We rely on our own judgement, seek our own path and reject both blind conformity and mindless rebellion. Extropians choose their values and behavior reflectively, standing firm when required but responding flexibly to novel conditions.

Self-responsibility and self-determination are incompatible with centralized control, with its stifling of the free choices and spontaneous ordering of autonomous persons, and requires the fewest restrictions compatible with maintaining the conditions of freedom. Beyond agree-

ment on these principles extropianism places no limits on the paths one takes in the pursuit of self-transformation.

3. Dynamic Optimism.

We espouse a positive, dynamic, empowering attitude. To successfully pursue our values and to live our lives we must reject gloom, defeatism, and the typical focus on negatives. Problems - technical, social, psychological, ecological - should be acknowledged but must not be allowed to dominate our thinking and our direction. We respond to gloom and nay-saying by exploration of possibilities and their active promotion. Extropians hold to both short and long-term optimism - in the short term we can cultivate our lives and enhance ourselves; in the long run the positive potentials for intelligent beings are virtually limitless.

Where others see difficulties, we see challenges. Where others give up, we move forward. Where others say enough is enough, we say MORE. We espouse personal, social, and technological evolution into ever higher forms. Extropians see too far and change too rapidly to feel future shock. We are the leading wave of evolutionary progress.

4. Intelligent Technology.

Extropians affirm the necessary and desirable role of science and technology. Practical means should be used to promote our goals of immortality, expanding intelligence, and increasing power. Science and technology, as disciplined forms of intelligence, are to be fostered, and we should seek to employ them in eradicating the limits to our extropian visions.

We see technological development not as an end in itself but as a means to the achievement and development of our values, ideals and visions. We seek to employ science and technology to remove limits to growth, and to radically transform both the internal and external conditions of existence.

Extropianism is a transhumanism. Religion has traditionally provided a sense of meaning and purpose in life, but it also destroyed intelligence and stifled progress. The extropian philosophy provides an inspiring and uplifting meaning and direction to our individual and social existence, yet it is flexible and firmly founded in science, reason, and the unending search for improvement.

READINGS

These books are listed because they embody extropian ideas. However, appearance on this list should not be taken to imply full agreement of the author with the extropian principles.

Freeman Dyson: *Infinite in all Directions*.
Hans Moravec: *Mind Children: The Future of Human and Robotic Intelligence*.
Eric Drexler: *Engines of Creation*.
Robert Ettinger: *The Prospect of Immortality*.
Man Into Superman.
FM-2030: *Are You A Transhuman?*
F.M. Esfandiary: *Optimism One*.
Up-Wingers.
Telespheres.
Mike Darwin & Brian Wowk: *Alcor: Threshold To Tomorrow*.
Jerry Pournelle: *A Step Farther Out*.
Albert Rosenfeld: *Prolongevity II*.
Richard Dawkins: *The Selfish Gene*.
Jerome Glenn: *Future Mind: Artificial Intelligence*.
Timothy Leary: *Info-Psychology*.
Alan Harrington: *The Immortalist*.
Julian Simon: *The Ultimate Resource*.
Julian Simon and Herman Kahn (eds): *The Resourcefull Earth*.
Paul M. Churchland: *A Neurocomputational Perspective*.
Robert Anton Wilson: *Prometheus Rising*.
The New Inquisition.
Grant Fjermedal: *The Tomorrow Makers*.
Adrian Berry: *The Next Ten Thousand Years*.

Fiction:

Marc Stiegler: *The Gentle Seduction*.
James P. Hogan: *Voyage To Yesteryear*.
Bruce Sterling: *Schizmatrix*.
Greg Bear: *Eon*.
Vernor Vinge: *True names*.
Ayn Rand: *Atlas Shrugged*.
Robert Heinlein: *Have Space Suit - Will Travel*.
Robert Shea and Robert Anton Wilson: *Illuminatus!* (3 vols.]

See the Resources section in every issue of EXTROPY; this lists many publications and organizations which promote extropian ideas of one kind or another.

The Thermodynamics of Death

by M.C. Price

First this little planet with its winds and ways, and then all the laws of mind and matter that restrain him. Then the planets about him, and at last out across immensity to the stars. And when he has conquered all the deeps of space and all the mysteries of time, still he will be beginning.
- The Shape of Things to Come.

Cataclysmic Futures

As an immortalist I want to live forever. Not just for a thousand or a googolplex of years but forever. It is the almost universal opinion of scientists and philosophers that the universe we currently live in will become uninhabitable with the passage of time, and this is accepted at face value by many people. Such people can dismiss the idea of personal immortality because they see it as incompatible with a universe in which life is an ephemeral phase. This article will expose the total falsity of this mindset, by the simple expedient of applying a modicum of logic to this situation.

Pessimistic eschatological visions of the future have traditionally appealed more to the human mind than utopian visions. In Scandinavian mythology all is lost at the end of time as the Frost Giants wage war against the gods, the Fenris-Wolf is loosed and the World-Worm awakens, leading to the destruction of the three worlds of gods, dwarfs, and men in the cataclysmic fire of Ragnarok. Hinduism has a ruling trinity of the Creator, Preserver, and Destroyer; the latter will destroy the world in an orgy of flame at the appointed hour. Early Christianity revelled in the imminent destruction of the world, as set out in Revelations, until its adoption by the emperor Constantine as a state religion, and is still enthused about in almost every crackpot fundamentalist sect, permeating many facets of Western culture.

Turning to more serious, (if not quite so graphic) visions, there are some projections of the future that we can dismiss because they ignore the reality of the technological progress (replicator technology coupled with superintelligence will vastly expand the resources available for coping with inimical changes in the environment). Scenarios that fall into this class are ones that project natural trends in the universe at large into the distant future. Two examples are:

In about 10 billion years (give or take 5 billion - but then what's a few billion years to the likes of we immortals?) the sun will burn out, the seas will freeze over, the skies will darken, the plants and the rest of the ecosystem will perish and will all die. Well I don't think I'll be losing any sleep over that one, since in 10 billion years civilization will have spread far, far beyond the confines of the Local group of galaxies (self replicating space probes and all that - see later), let alone our own puny solar system.

On a slightly longer timescale is the collapsing universe picture which envisages the Hubble expansion of space, and the embedded galaxies, as halting billions of years from now; the exact time is unclear and depends on the average density of the universe, which has yet to be accurately determined. All the indications are that the universe is very close to the watershed density, below which the expansion never halts. Then it reverses and, over a period of time comparable to the expansion, comes to resemble the interior of a nuclear furnace, as the ambient temperature rises, and we are all reduced to our subatomic components.

Unfortunately for this grim outlook (but fortunately for us) we will have had total mastery over space itself for billions of years and by then will be quite up to the job of stopping the contraction of the universe. Ever since Einstein we've known that the space-time fabric feels the effect of forces (gravity in particular) in the same way as other materials. More recently with the advent of unified field theories we've come to realize that the forces of physics are all aspects of one central force. The corollary of this is that we'll shortly have the same control over gravity (and the other forces) that we currently exert over electromagnetism. This will lead to space being manipulated as readily as current building components (giving us wormholes through space for travel, for example). We'll have the option either of stopping the contraction directly or of constructing separate bubbles of space to inhabit, to avoid the Big Crunch, of

fireball picture

more likely some other method that we can't foresee at the moment.

Self-Replicating Probes

In the next category of objections are projections of technological advances that are considered in isolation. An example of this is the colonizing/terraforming of nearby and distant star systems by self-replicating intelligent space probes, an idea championed by Frank Tipler. Earth sends out the first generation of probes, each of which travels to a nearby star system, to set up its automated factories there. Terraformation of the system proceeds under the probe's mechanical brain, along with the next generation of probes. Later, civilization from Earth follows to occupy the prepared environment set up. In this way the galaxy can be colonized within a few million years, without the need for faster than light travel.

The cautionary note on the subject has been sounded by Nigel Calder. His thesis is that Darwinian selection would operate on the probes, evolutionary pressures selecting against the terraforming, but strongly in favor of the reproductive mechanisms (bearing in mind that probes with extensive error correcting servomechanisms will reproduce at a slower rate than other, less careful, probes). Clearly probes that concentrate purely on breeding will have a reproductive advantage over the terraforming probes. Within a number of generations the 'nice' probes that were originally sent out are superceded by 'nasty' ones, which fight amongst themselves for resources (planets and other interstellar material). Instead of terraforming the Milky Way, Earth will have spawned a new form of life that feeds on planetary material, which return as waves of ravenously hungry space rats, to reduce us to molten slag.

Orbiting planets picture

This is to take a narrow view of the situation. It is rather doubtful that Sol will relinquish hegemony over the galaxy by allowing uncontrolled breeding of probes. Each probe will impress upon its descendants loyalty to its builder as part of its programming, each succeeding generation programming the next faithfully, establishing a chain of command with us at the top. Evolutionary pressures can only become active agents when the probes are competing with one another, so the extra effort involved in instilling obedience into probes is not selected against. Let's assume, however, for the sake of argument, that the chains of authority are broken and autonomous spheres of influence emerge (i.e., cultures form amongst the probes that don't acknowledge fealty to Sol). The star systems around Earth will have been settled by probes that are loyal to Sol, with their programming which makes them receptive to instructions from Mission Control and each other, in force. Therefore they will be able to cooperate with each other more effectively, across a wider domain of space, than the 'nasty' probes. Wars between the descendants of 'nasty' probes will avoid our sector because they know they will meet with more organized resistance here than elsewhere. There is a more general underlying problem here, namely the division of finite resources amongst an expanding population of immortals, that I will address later in the article.

Are there any other visions of the future which may justifiably cloud our dreams of an endless demi-godlike existence? Well this would be a boring article if there were not some other more substantive objections to tasting the Apples of Immortality. So let's examine the thermodynamic objections, since they make no artificial assumptions about bounds or trends on technological growth, but are based on the limitations imposed by physical law.

Thermodynamics

The laws of thermodynamics are macroscopic descriptions of the behavior of systems, which are in principle deducible from more fundamental principles, such as Newton's Laws of motion, but which provide an essential short-cut in analyzing a complex system's behavior. Only the first two laws interest us here. They were formulated in the 1840s and accompanied the growth in understanding the principles behind the operation of internal combustion engines. Here I've stated the laws in the form most germane

to our purpose.

The First Law of thermodynamics states that the energy of a closed system remains constant, with energy being neither created nor destroyed by internal processes, but merely converted from one from to another. The use of the word energy differs here from popular use. If I turn on an electric light then I'm not using up energy in the strict sense of the word. What's happening is that electrical energy is being converted into electromagnetic energy (photons or light particles) and finally into thermal energy when the light is absorbed by an object. This law looks like a statement of the obvious to us now because we've become familiar with the concept of energy, but when it was originally formulated in the mid-nineteenth century the notion of energy was new.

The Second Law of Thermodynamics is more interesting to us and says that the entropy (which is a precise measure of the amount of disorder present) of a closed system always increases. Life is a system or structure that maintains its order (homeostasis) in the presence of hostile environmental factors. Life and entropy can be viewed as opposing tendencies. A living organism sustains its existence (internal homeostasis) by transferring order from its environment to itself (feeding). Viewed as a whole (food plus consumer) the activity of maintaining life increases total entropy, as do all processes. Life on Earth has been living off the temperature difference between the surface of the sun (which determines the spectrum of sunlight) and interstellar space, which has acted as a heat sink for the waste energy of life.

The two laws have stood the test of time very well, with the definition of energy and entropy being extended, from their earliest conception by the classical physicists, to take into account relativity and quantum theory.If it could be shown that these two laws forbid immortality then we'd be in a very sorry way, and the prospect of immortality would have to be confined to those same halls of infamy of pseudo-science that contain methods of squaring the circle. Luckily this isn't the case and the very arguments proposed by many scientists and physicists against eternal existence, that use thermodynamics, can be defeated by applying these same laws more rigorously.

Maximum Entropy?

The case against the persistence of our structures into eternity is very simple and seemingly watertight. It is that the universe is a closed system and therefore its entropy level will eventually rise to the maximum allowed by its energy constraints and in the process all ordered systems (which includes life in all its possible forms) will be eradicated. This fate is known vividly as the heat death of the universe, all the usable energy having been dissipated as heat, and rather gripped the Victorian mind, one of the earliest descriptions of it appearing in the classic SF novel *The Time Machine* by H.G. Wells. Travelling far, far into the future the time traveller comes into an era of desolation when all life has passed from the surface of the Earth, the Morlocks and Eloi and everything else of any relevance. this is a picture of the end of the world that reappears throughout

explosion picture

the time travelling genre. The universe left at the end of this process is a sterile, bitterly cold barren wilderness in which every erg of energy has, eons past, been converted to heat and radiated out into the void.

Calculations have been done on how long intelligences can maintain themselves, in the face of the encroaching heat death, powering themselves from stars and later, when all the stars have burnt out, the gravitational fields surrounding rotating black holes. After about a quintrillion years (by which I mean a trillion raised to the fifth power, or 10^{60}) the power becomes too meager to sustain life. We don't have to concern ourselves trying to get some handle on the vastness of this span of time (although I mention in passing that there are approximately a quintrillion subatomic particles in the solar system, for those aspiring mental gymnasts who wish to attempt this awesome feat), except to note that this falls far short of our friend infinity (or more accurately, aleph-0). Long after the passing of life the matter is mopped up by black holes which much, much later evaporate (via Hawking radiation) into a cloud of low energy photons. Any matter not swallowed by black holes turns into a mixture of free electrons, neutrinos and photons, via proton decay, so that the lifeless universe is finally stripped of all vestiges of material objects.

The universe has zero total energy.

This looks very somber for us. All our efforts doomed to eventual failure, ending up as dust (or rust), not food for worms but rather turned into a rarefied gas cloud. We can imagine the once mighty sentient beings of the dim and distant future eking out a miserable existence in the long twilight of their lives, jealously hoarding their power supplies

like dragons of old myth, guarding caverns of gold, postponing the awful day of non-existence for as long as possible. If this is what fate has in line for us, cheating us of our rightful destiny as Masters of the Universe, Lords of Creation, then we might as well drink from the cup of hemlock now and die with a curse on our lips, in the flower of the universe's youth, rather than its miserly old age.

The Open Future

What the doom merchants have forgotten to do is apply thermodynamics to the creation of the universe itself in the Big Bang. All processes are subject to the constraints of physical law. Therefore the creation of the universe must conform to the First Law. Since there was zero energy present before the creation then there must be zero now, i.e., the universe has zero total energy. Bizarre though this concept seems it is the inevitable consequence of applying physical law to all aspects of existence. All energy must be balanced by an equal amount of negative energy. The immediate inference we can draw from this is that, whilst the sum of the energy in the universe totals to nought, the amount of free energy available for our use is unlimited. The concept of negative energy has been around for many years, although I won't go into technical details here, it has long been recognized that the gravitational field possesses negative energy and that this could balance the positive energy tied up in matter. There are other interpretations though, so I won't place my entire trust solely in gravity.

Life in Utopia will be the birthright of all self-interested rational beings.

Most cosmologists working in the field of the evolution of the early universe accept the Inflationary Theory which accounts for the size and expansion of the universe, in the period immediately after the creation (which is being seen as the necessary consequence of physical law acting on nothing), by a massive injection of energy from literally nowhere, which occurred when the vacuum that existed after the dimensions of space-time had stabilized decayed to the vacuum that exists now. The decay happened because the current vacuum state has a lower energy density than the original, with the energy gap fueling the production of matter in the early universe. Such symmetry-breaking of the vacuum, as it is known in modern field theories, is believed to have happened a number of times and implies that the vacuum today possesses a negative energy with respect to an earlier one. We don't perceive this as negative because all energy levels are measured relative to others and we commonly accept the energy of the vacuum state as our zero-point yardstick - in other words, we are defining the lowest energy level currently available as the base against which all other levels are measured. When we have the forces of nature under our control then we shall be able to generate power by the same principle, although in a much more effective and controlled manner (by the principle that anything that nature does we shall eventually surpass) - like flight). The fact that the energy of the universe sums to zero is what will stop life from being a zero-sum game. The Inflationary Theory is also known colloquially as the Free Lunch theory, for obvious reasons.

The resolution of the apparent paradox of this with the Second Law lies in the fact that whilst the total amount of entropy will always increase across the totality of existence, the ability of the environment to handle all this undesirable, high entropy waste (e.g., heat) will be rising faster. The First Law, whilst being true in actuality, is effectively rendered impotent as a limitation on the access of civilization to power supplies.

This means that we, the Immortals, can look forward to a future in which there are truly infinite power sources available for tapping, a veritable bottomless horn of plenty, to meet our needs for all eternity. We can see now the solution to the problem of meeting the needs of an ever expanding civilization. In the universe that's opening up to us the resources won't be finite. Ergo the conflicts that arise from scarcity will disappear. Life in Utopia will become the birthright of all self-interested, rational beings, a world of wealth beyond all dreams of avarice, a never-ending lazy existence, with all our desires attended to by superintelligent servants, our minds expanded to unimaginable dimensions, free to roam across the vast reaches of space. The future belongs to us, for ever and ever, worlds without end. Even after a quintrillion years we will still have only just begun. The best is yet, and always shall be, to come.

Thus the Jeremiahs are refuted. Elementary really.

The Transhuman Taste
By MP-Infinity

A review of:
Joe Haldeman, *Buying Time*. New York: William Morrow, 1989. (Also available in paperback through Avon Books.)

As I speculate in my essay "Opening the Transhuman Mind" and its postscript, extropians are in an awkward situation when we try to find aesthetic gratification. On the one hand, the traditional humanities glorify entropic forces - Ignorance, State, Religion, and Death. On the other hand, the art of the posthuman Singularity, where our extropic values come to fruition, is not yet available - and even if it were, we would not be able to understand it. Between the humanities and the posthumanities we are groping for the transhumanities, where extropic values are expressed in forms which extropic humans can appreciate. this new column, "The Transhuman Taste", will review arts which explore extropic themes.

Naturally science fiction (SF) is a logical place to look for transhuman gratification. Consider, for example, Joe Haldeman's SF novel *Buying Time*. This is an attempted transhuman tale involving rejuvenation techniques, anarcho-capitalist societies, uploaded human minds, hypermedia, space habitation, and the accidental creation of superhumans. Any one of these developments would revolutionize the world, but Haldeman's indiscriminate mixing of these elements does not generate the right fictional reaction.

In the 21st-century world of *Buying Time*, a powerful private foundation markets the Stileman regeneration process through clinics in London and Sydney. In exchange for one million pounds or one's entire fortune, whichever is greater, a person can buy an additional dozen years of youth and health. The process can be repeated indefinitely, so after a few decades Earth becomes dominated by several hundred centenarian-plus Randian/Heinleinian personalities, called Stileman immortals, who through this sort of artificial selection have become adept at raising the money for continued regenerations.

The central character is Dallas Barr, who at age 130 has just endured his ninth regeneration. While scheming to earn his next million, a shadowy cabal of Stileman immortals calling itself the Steering Committee tries to recruit him into its world-government conspiracy. Dallas dislikes authority, however, and when agents of the conspiracy try to kill him, he flees Earth to seek refuge in the anarcho-capitalist society on Ceres, accompanied by a very old Stileman girlfriend named Maria and the uploaded version of a Stileman named Eric, the biological version having been murdered. Maria is near the end of her most recent dozen years of life extension, however, and for religious reasons is planning to die in a few months.

While I wish not to reveal the rest of the story, I have several complaints about the fictional world Haldeman has created. Dallas's psychology is familiar enough to SF readers, but I found Maria's character hard to understand. Her eventual loss of religious faith and her decision to go on,living are extropically engaging, but her motivations are not plausibly explained. The uploaded Eric saves Maria's life through one of those cross-indexing miracles which should become common once hypermedia systems come on-line, yet the novel's world shows no signs of the revolutions which uploading and hypermedia would cause. Nor does the novel explore the uploaded Eric's "identity". Haldeman also apparently thinks that in anarcho-capitalist societies it would frequently be necessary to threaten people with force. Would this really be the case? And finally, Haldeman uses an unsatisfactory ad hoc pharmacological accident to turn Dallas and Maria into superhumans - a deus ex medicamentum ending for which I was not prepared.

While Buying Time is mildly entertaining, and may infect its more naive readers with extropic memes, i am disappointed by Haldeman's inconsistent exploration of extropic ideas. To his credit he avoids the "Volcek Syndrome" (refer to Mike Darwin's review of Wiseguy in the May 1990 issue of Cryonics) by presenting life-extenders as likeable people. And by explicitly dedicating his novel to "the interesting people doing research in life extension, cryonics, and other such intimations of immortality," he makes it clear that the coming era of man-made aeonic life is based on real projects underway now.

In closing, I would like to quote from the last paragraphs of the novel, which neatly describe the extropian dilemma

A complex analogy occurs to me, but it's more a felt thing than a reasoned thing. A verbal simulacrum of it goes like this: a normal human adult stands in relation to us - rather, to what we are becoming - as a normal child stands in relation to the adult. The child can't really comprehend the adult's attitude toward love, work, morality, and so forth, and he doesn't have to, in order to be a "successful" child. As he grows, then, he moves toward being a successful adult partly by copying the adults around him and partly by developing internal resources adequate for facing adult life.

We're in a situation sort of like that. In a real sense, normal humans can never actually understand us. But that doesn't mean superiority; inside, we are like children with no adults to copy. Like children who are compelled to invent love, work, morality in the absence of models. Though the things we're inventing don't have names.

All we really know is that we aren't children any more. That we blinked and found that the playground has suddenly become infinite.

Neurocomputing Part 3

by Simon! D. Levy

In the last issue of *EXTROPY*, I described the computational device known as a perceptron, and described what it could and couldn't do. The class of problems which a perceptron cannot solve, called *linearly inseparable problems*, includes the XOR problem. As you may recall from the previous article, this problem requires a function that generates the following mapping from inputs to outputs:

INPUT		OUTPUT
0	0	0
0	1	1
1	0	1
1	1	0

In other words, the output is true (1) when either input, but not both, is true; otherwise, the output is false (0).

This sort of problem can be solved by adding a *hidden unit* to the perceptron. As illustrated below, a hidden unit is a unit that is placed between the input and the output of a neural network in order to generate the current mapping.

FIGURE 1

If you remember that a sigma stands for summation, that the numbers on the lines stand for multiplication, and that the bullet-shaped symbols are thresholds, you can see how this network produces the mapping for the XOR function. Essentially the purpose of the hidden unit for this particular network is to generate a value of -1 when both inputs are 1; this -1 value "cancels out" the two positive 0.5s that result in that situation. The problem is how to train the hidden unit, since the perceptron algorithm described in the last article does not refer to this unit.

A number of methods have been devised for training networks containing hidden units. One of the most common methods relies on the mathematical technique known as *gradient descent.* Gradient descent is a method of minimizing the error produced by the network, where the error is defined as the difference between what the network's output should be and what it actually is.

To understand how gradient descent works, imagine that we have a very simple network, with only one input and one output, and hence only one weight (multiplication) between the input and its threshold. Assuming that we know what the output *should* be, we can plot the error as a function of this weight:

Figure 2

The best value for the weight corresponds to a point where the error is at a minimum, in this case, a weight of 0.6.

Gradient descent is a technique for finding the quickest path to a minimum point in the error function. The idea is to find a path for which the derivative (slope) of this function is the largest (steepest), where the derivative is defined as the difference between the current value of the function and the next value we look at. By changing the weights in a direction along the steepest path, we will find the fastest route to some minimum value of the error function

(but not necessarily the smallest value - more on that problem later).

So, for the first error function, let's say we start out with the weight at 0.4. Which direction should we go in? Well, the slope is steeper to the right of 0.4, so rightward is the correct direction. Once we reach the minimum error at the weight 0.6, the derivative becomes negative, because the next value is larger than the current value. Therefore, we stop moving when the weight is 0.6.

Of course, a real network will have more than one weight (the simple XOR network shown in Figure I has five), and the error function we plot will therefore have more than the two dimensions shown in Figure 2. Gradient descent does what it's supposed to regardless of the number of weights. (I find the idea of "skiing toward the minimum in a multi-dimensional space kind of neat, even if it is impossible for my mind to visualize a space of more than three dimensions!)

The question is how to find the steepest slope in our multi-dimensional space. Looking everywhere in the space would take an impossibly long time. Fortunately, it has been mathematically proven that a more general version of the perceptron-learning rule (which is also known as the *delta rule*) corresponds to gradient descent. (For a formal proof, see Chapter 8 of Rumelhart and McClelland's *Parallell Distributed Processing*, MIT Press, 1988). As described in my last article, the delta rule says the following: See what the output is for the network with a particular set of inputs and weights. Take the difference ("delta") between this output and the desired output, and multiply each weight by that difference.

The *generalized delta rule* says the same thing, with a couple of differences: First, the delta of a hidden unit is computed in terms of the deltas of the next units in the network (the next "layer"), and the weights connecting the hidden unit to those units. Specifically, we take each weight between the current unit and each of the next units to which it connects, and multiply this weight by the delta for that next unit. Then we add the results of all these multiplications together to get the delta for the hidden unit. For the XOR network above, the "next layer" would be the output layer. At the output layer, delta is simply the difference between the desired output and the actual output, as it was in the perceptron. In this manner, the generalized delta rule gives us a recursive procedure for computing the deltas at each layer, in terms of the deltas at the next layer, and the buck stops at the output. That's why the technique is referred to as *back propagation*, because we start at the output units and work our way back through the hidden units, calculating the deltas.

The second difference between the generalized delta rule and the simple delta rule comes from the fact that the gradient descent technique looks at the slope of the error function, as illustrated in Figure 2. For a threshold, such as the thresholds shown in Figure 1, this slope is infinite, since the output of the threshold function goes from zero to a positive integer in no time at all. (See Figure 3.)

In mathematical terms, an infinite slope is *undefined*, so we need some other function to calculate the output of a unit. One such function is shown in Figure 4.

This function, called a *logistic activation function*, looks a lot like the threshold activation function in Figure 3,

Figure B here

Figure 3

Figure C here

Figure 4

except that the logistic activation function is *continuous*. in other words, it never jumps suddenly. Therefore, its derivative can be computed, allowing us to perform gradient descent. The second difference between the generalized delta rule and the simple delta rule is that the delta value is multiplied by this logistic activation function. So, to put it simply, the delta for a hidden unit is the logistic activation function for that unit, times the sum of the next weights and deltas.

If all this seems terribly complicated, let me assure you that computer programs for back-propagation can be quite short. In fact, I'd be glad to send a copy of a program for the XOR function problem to any interested readers of *EXTROPY*.

As I mentioned parenthetically earlier in this article, gradient descent does run into a problem if the steepest path in the error function does not lead to the smallest value of that function. An example is shown in Figure 5.

(FIGURE D HERE)

FIGURE 5

In Figure 5, we start at a weight value of 0.4. The steepest path is to the left, but that path leads to an error value that is not the smallest. We have reached a *local minimum* in the error function, and we are stuck, because movement away from that minimum will give us a negative slope.

The problem of local minima is perhaps the most serious problem encountered in using gradient descent techniques. In Chapter 8 of *PDP*, Rumelhart, Hinton, and Williams report running into this problem only two times in several, hundred training sessions for an XOR neural network. The problem can be more serious in larger networks.

Despite this difficulty, back-propagation has been used successfully in a number of applications. The application that I am most familiar with is speech recognition, in which researchers attempt to make computers figure what someone said while talking. The implications of achieving this goal are tremendous. Coupled with a natural language understanding system, a speech recognizer would allow us to communicate with computers as easily (or with as much difficulty!) as we talk to one another.

(Note: Virtually every science fiction movie and TV show I've ever seen has a computer that the characters talk to, instead of using a keyboard. Interestingly enough, these computers usually have silly, non-human-sounding voices. The technology to give computers human-like voices has been around for quite a while, whereas speech recognition is still in the works. This situation reminds me of the standard response to people who are horrified at the idea of putting only one's head, and not the whole body, into cryonic suspension: By the time reanimation becomes possible, the technology for cloning a new body will probably have been around for some time.)

The back propagation technique is an example of *supervised learning*. We tell the network what its output should be, and the network modifies itself by comparing this response with its actual output, via the generalized delta rule. There are also techniques for *unsupervised learning*, in which we let the *network* decide what it's going after, instead of telling it what we want. unsupervised learning is particularly interesting from an Extropian point of view, because it allows us to discover the underlying structure of a system without any explicit assumptions about what that structure is. I'll discuss unsupervised learning in the next issue of *EXTROPY*.

Put network picture here

Weirdness Watch

by M.P.-Infinity

A review of Texe Marrs, *Mega Forces: Signs and Wonders of the Coming Chaos*.
Austin: Living Truth Publishers, 1988.

Extropic memes have been working their way into our society during the last few years, so it is not surprising that a few of them have infected Fundamentalist Christians. Some early results seem to be weird, apocalyptic interpretations.

One such observer of extropic trends is Texe Marrs, a retired USAF officer who now runs a ministry in Austin, Texas, and publishes books on topics ranging from Bible prophecy to popular robotics. I have heard him on several occasions on Marlin Maddoux's Point of View, a Dallas-based national Christian radio talkshow. Marrs is apparently on his way to becoming a well-known Fundamentalist, and may become an opinion maker among this large American sub-culture some day.

Marr's book *Mega Forces* attempts to show how foreseeable advanced technologies will be used in ways supposedly predicted by the Bible - the usual Antichrist/Armageddon/Second Coming scenario. Needless to say, his main worry is "unbelief", and in Chapter One he writes, though not quite astutely:

As high technology dramatically transforms our lives, people harden their hearts to God and become dependent on technology and science for fleeting happiness and peace. In the next few decades, we will see an incredible explosion in high-tech discoveries and scientific breakthroughs. But with each step toward progress in science, you can be assured that God will recede in the minds of men and women. The tragedy of our era - the end of time - is that Satan has convinced the masses that science proves that the personal God of the Bible does not exist and is not needed by sophisticated worldly men. The future reality, then, is more science and less God, because man's faith in God is, regrettably, diminished in direct proportion to his progress in science and technology.

While extropians would agree that "more science and less God" is the proper trend, Marrs sees that as a problem. For some illustrations of extropian interest in the "more science" category, in Chapter Two, "Man the Creator: Robotics and Bioengineering," Marrs outlines some of the more exciting projects for attaining transhumanity, then he adds his own warped opinions. Of the prospect of immortality he writes:

Courtesy of technology, immortality - the fountain of youth - is several decades off at best, if it ever can be achieved, and if God permits it to
happen. But the concept is being considered as a viable future possibility. Jesus promises us eternal life if we trust in his Word and invite the Holy Spirit into our lives. Rejecting this promise, we are off on a desperate quest to guarantee eternal security for ourselves.

Significantly, Marrs does not rule out man-made aeonic life *a priori* - the prospect just seems unlikely to him because he thinks "God" will intervene before it comes online. He does not mention cryonics, though I imagine it would similarly meet with his censure.

Additionally Marrs asserts that the "New Age" religion is behind various extropic ventures, and writes:

It is therefore a dread but conceivable prospect that future dictators - and certainly the Antichrist (see Revelation 13 and 17) will marshal bioengineering scientists in a grand project to create the man-god being, a superbeing. New biochips will be designed and programmed to despise God and the Holy Bible while exalting man's own divine potential. These biochips will be programmed with man-made philosophies, including the "best" teachings of Hindu and Buddhist scriptures, the "wisdom" of ancient Egypt and Greece, and the "knowledge" of such "scientific" theories as evolution and psychology.

The rest of the book is devoted to discussions of military hardware and political scenarios, along with the usual calls for repentance and salvation.

What if it? First of all, the fact that a book filled with questionable (not to say ridiculous) assertions could be commercially published in this country says a lot about the feeble mentalities cultivated by religion. Second, although I share Marrs' fears of the misuse of technology by statists (whom he mythologizes as the "Antichrist), on the whole I think that books in the *Mega Forces* genre could be quite harmful if they succeed in confusing extropic memes with the New Age religion and global statist plans. Extropy is a state of reliberium, and careful extropians should avoid speaking of attaining "godhood", since as F.M. Esfandiary (now FM-2030) argues:

Contemporary philosophers state that we humans

are striving to be god. Others more critical admonish us for arrogantly "playing god". They warn of dire consequences. these critics are absurd. We humans do not want to be god or to play god. We aspire to much more. God was a crude concept - vengeful wrathful destructive. We humans want to evolve beyond god. (*Up-Wingers*, New York: The John Day Company, 1973, p.143.)

Moreover, books of this sort add to millenarian madness, and will need to be countered with appropriate "memecides". For example, when religionists tell me that the book of Revelation predicts things to come in Europe and Western Asia, I point out that characters in Revelation fight with swords, own slaves, and ride horses for regular transportation; I have not visited the Mediterranean, but I have heard that life there is not quite that primitive. Fighting religious memes will be a major task in the next few decades if we are to head off man-made catastrophes, and applied memetics is a desperately needed discipline.

LETTERS

Dear Max,

Tsk, tsk. When cryonics is in such a socially and legally precarious situation, we extropians need to spread our memes in a socially responsible manner. As Allen J. Lopp suggests in his review of the Jan. 4 1990 L.A. Law episode, we need to justify our desires for immortality, wealth, and power in terms of feelings and relationships.

A's "Arch-Anarchy" is an especially egregious example of the Faustian propaganda we need to avoid. (After sketching out a plan to become God, what will A write for an encore?) I find it ironic that A, a self-professed arch-anarchist, wants to become the Arch-Statist. It is no coincidence that dictators are accused of "playing God" and of trying to do the contradictory and the impossible. A's projected Brave New Jerusalem does not appeal to me, and I may try to sabotage things by becoming Lucifer. It is better to rule oneself than to serve A in heaven.

By the way, another "must" addition to the extropian library is *Analog Essays on Science* (New York: John Wiley Sons, 1990). Getting essays by Drexler, Henson, and Donaldson together in one volume is worth the price alone.

Extropically yours,

Mark Potts, aka M.P.-Infinity.

FORUM

ARCH-ANARCHY: MORE AND AGAINST.

by Max More.

"Arch-Anarchy", as befits its avowal of contradictions, finds me cheering and yet booing. Contrary to A however, I shall show that the apparent contradiction is unreal by analyzing my reactions into consistent parts.

First, since most of what I have to say will be critical, I wish to be clear that I fully share A's spirit, the spirit that questions all limits and seeks new freedoms.I believe we will continue to gain control of natural forces and will continue to expand our capacities indefinitely. No limit can be declared final and ultimate; our always limited (and so always growing) knowledge forever offers the possibility of new freedoms and expanding horizons.

(1) What I disliked about the article was the possible authoritarianism and irrationalism of some of the ideas. The opening is indeed rousing, but note that it is a "call to arms". Extropians prefer ideas to weapons, reserving weapons for a last resort in self-defence. Surely we would do better to refrain from violent metaphors in our exhortations to advancement.

The implicit authoritarianism pokes its head out in A's characterization of the universe into two opposing forces: his (hers or its) will and obstacles to his will. The universe cannot be so rigidly categorized however: The wills of others can be a enabling condition of my own will; this is the basis of social cooperation. The extropian individualist does not hold that you are for or against him. He does not hold you to be part of the solution or part of the problem. Rather he sees that without others to provide a context for what he wants or does, his positive freedom would be meagre indeed. For-or-against me thinking tends to lead to you-and-not-me thinking, i.e., either authoritarianism or barbaric conflict.

Similarly, non-sentient limits outside me provide a context which provides structure and form. Gravity is not necessarily my opponent. If I want to enjoy the sensation of free falling through the air, if I want to feel the satisfaction of muscular exertion, gravity is my friend even though holding me back. Clearly A does not want to deny this, only to recommend us to gain the power to ensure that the presence of gravity is under our control. This view I share, but putting it in terms of fundamental conflicts is not accurate and lends itself to entropic degeneration and conflict.

(2) A claims to refute the principle of non-contradiction His method consists of an application of Descartes'

notorious scholastic "Reality Principle": X is more real than Y if Y couldn't exist without X. Since no modern philosopher that I know of accepts this principle, A's "refutation" can hardly succeed in meeting those philosophers on their own ground. I will leave to the reader the task of determining the many problems with Descartes' principle.

A's argument also fails, as must any argument against the principle of non-contradiction, because if he is to succeed in making an argument his words must have a determinate meaning. Without the principle of non-contradiction his words have no determinate sense and so cannot constitute an argument at all. In other words, if his argument is right it is meaningless and so self-refuting. Further, as is well known in logic, allowing contradictions means that anything goes. Fine, so long as you are willing to throw out meaning, knowledge, and progress.

I would agree that some principles of classical logic may be revisable - the distributive law of Boolean logic is rejected in quantumm logic for instance. But this does not motivate the possibility,let alone the actuality, of rejecting the fundamental principle of non-contradiction. Whenever we come across a contradiction it's a clear sign that our concepts are confused, that our data is in error, or that we have not yet penetrated to a consistent underlying explanation.

[A brief note: Line 3 of A's footnote 12 should be "~A" rather than "~B"; this has been corrected in the second printing of EXTROPY #5.]

(3) A's rejection of the principle of non-contradiction was motivated by a wish to throw aside all limitations on his freedom. However, I think he is seriously mistaken to believe that embracing contradictions is the way to achieve his goal. If you want to believe there is or can be a being that is infinite -a being with infinite degrees of all qualities - it is necessary to suppose the being to hold within itself many (an infinite number?) of things or qualities which are mutually inconsistent. A mentions two of the traditional powers of God which conflict: omnipotence and omniscience. Rather than taking this to suggest an incoherence in the concept of an infinite being, A chooses to reject consistency. I have argued above that this is a bad choice. As extropians we want to continue increasing our knowledge and understanding, and to continue increasing our experience, value, importance, and happiness, as made possible by our improving conceptual schemes.

Strange as it may sound, my criticism of A's view of the extropian goal is that in his talk of an infinite being, whether called God or the Ein Sof, he is being insufficiently ambitious. The fundamental extropian value is that of expansion, of wanting MORE. An infinite, unlimited being would have no more to seek, no more to move toward. If we were to become the Ein Sof (supposing, as I do not, that the idea is comprehensible), we would stop our progress and stagnate. We would have to wallow in our infinitude. No condition is the final condition for the extropian. The joy is in the pursuit; it is in the process of expansion, growth, intensification, progress, and not in the attainment of a final condition, even that of infinity.

But if the condition is infinite why should we be concerned about the end of progress? Answering this question runs into problems because of the obscurity of the idea of an infinite being. An infinite process is clear enough; examples such as the infinite series of integers are easily available. But what would an infinite state or condition be like? Does an infinite being include an infinite progressive process? If so, then surely the being is not infinite, since progress implies a current imperfection. Perfect beings cannot also be imperfect. (Again, embracing contradictions is only a way of evading this problem). But, if perfect and infinite being does not include an infinite progressive process, then that being lacks the good of progress and is limited in not being capable of improvement - something even we lowly humans can do! I suggest, therefore, that we reject the idea of an infinite being - God/the Ein sof - both in its religious form and in the form offered by A - as a dead end that can only be adhered to by deliberately evading giving meaning to our terms and thus by destroying our ability to reason and to progress.

Instead of striving for perfection and infinite being then, I suggest that the extropian dynamic is the continual process of growth, expansion and value-increase. It is the process that matters, not the state. (See Robert Nozick's discussion of the meaning of life in his Philosophical Explanations. I intend to develop this view in detail in a longer work currently underway.)

There is a way of giving workable content to the idea that I think A wants to defend, though it does not allow the retention of infinite states. I have argued that the extropian goal is really the continuance of the infinite process of expansion/improvement. Imagine a graph, with time being the vertical axis. The line representing the degree or amount of the extropic goods of wisdom, power, intelligence, and so on, rises from the horizontal line slowly at first and then accelerates away from the horizontal. The steeper the

extropic acceleration the closer to vertical the line becomes. If the line could become absolutely vertical, improvement would happen at an infinite rate. An asymptote is a theoretical place toward which such curves tend. I believe that A's God/Ein Sof is a way - a misleading way - of trying to represent that asymptote. Our rate of progress can never become infinite relative to time but it becomes arbitrarily close to it. Our goal is, in a way, that asymptote. However, it is a mistake to then conclude that there is a state - godhood - which is the goal. An asymptote is not a state to be reached. It is a point at an infinite distance from us in the future. It is the goal that keeps us eternally in motion, forever growing and improving. It is this that provides the extropic dynamic, not some state of godhood.

The positing of an infinite God that we will become (and who exists now) carries with it dangers which the extropian wants to avoid. A himself raises "the possibility that we might now worship the God that we will become." This is a frighteningly entropic picture. Praying to a higher being is an act of submission, and worship is a substitute for action. Believing that God already exists removes our motivation for improving ourselves. The history of religion provides examples of many other entropic consequences of worship and prayer that I will not detail here. Rejecting a state of godhood as our goal, and instead letting our goal be the asymptote - the eternally continually expanding process - is the truly extropic choice; it is the choice that motivates us to grow rather than stagnate.

Since my comments are already lengthy, I will forego commenting on A's conception of "laws" of nature (except to say I agree that since there is no cosmic legislator, they are not really "laws").

Bell to A

It seems to me that A, the author of "Arch-Anarchism", faces a paradox. On the one hand, A emphasizes the most extreme form of individualism imaginable: "As an arch-anarchist, I divide the universe into two opposing forces: my will and obstacles to my will." (p.11).

On the other hand, A softens this individualism by presenting a somewhat fuzzy view of the self. A say, for example, that "I am no more than a particular pattern of information, a set of data and processing rules. To the extent that I share this pattern with others, we share personal identities." A explicitly advocates joining with others in the most holy of matrimonies: "All anarchists aim at the same end, and those of us who reach it will merge into one being: God."

The conflict between these two views comes out quite clearly in the following quote: "As an arch-anarchist, I refuse to recognize the validity of any obstacle to my will. Is this selfish? Yes, but because I take a broad view of personal identity I am willing to consider other's interests along with my own." (p.17).

Here's the paradox: A's most distinguishing feature is extreme individualism. A thus shares identities most with other arch-anarchists (assuming there is more than one). Why? Because all arch-anarchists are extreme individualists. I conclude that the only beings with which A could merge identities are exactly the sort of beings unwilling to do so.

What will it be A? The solitude of extreme individualism or the company of imperfect friends? You can't have both. Nobody will come to your party if you try to have your cake and eat it too.

A to Bell.

That saying never made much sense to me. Of what use to me is my cake if I cannot eat it? Indeed, I cannot safely claim to have my cake until I fully possess it by wrapping myself around it and integrating it into my being.

There is no paradox here. Being an extreme individualist doesn't make me unsocial. I recognize that others can help me, just as they realize that I can help them. Our common enterprises give us common interests. We join, as Max Stirner would say, in a "union of egoists".

True, I am most likely to share identities with other arch-anarchists. Does extreme individualism force us apart? No. It draws us together. As we each advance toward self-perfection our separate paths converge, meeting at Godhood.

The real problem lies with those who seek union through selflessness. They cannot share identities for they have no identities to share. Theirs is truly a self-defeating paradox.

We arch-anarchists, on the other hand, *can* have our cake and eat it too. It is, if I may say so, our just desserts.

A to Potts.

You have obviously mistaken the God that I hope to become with the Christian figure of the same name. The God of which I speak is not "an old caucasian male with a long beard and a deep voice (that's Santa Claus)." (p.16) My God is more akin to the Tao, or what Robert Nozick calls Ein Sof: the totality of all universes, actual and possible. Given His bad reputation, I can understand why you fear the God of which I speak, however. The Ein Sof does not go around kicking heretic butt.

Because your fears are misplaced, your accusations are unfounded. Nowhere in "Arch-Anarchy" do I speak of ruling others. Rather, I advocate full respect for others' negative rights to life, liberty and property as long as we remain in anything that resembles our current world. Does the "as long as" clause set you off? What is the alternative? Should we worship libertarian ethics as necessary truths, as immutable laws we must never question? No. Negative rights have spontaneously evolved out of the undirected actions of self-interested agents. Because they help to coordinate our actions, they work to the benefit of each of us.

But this shows that negative rights apply only to beings like us in circumstances like ours; they are *contingent.* By the time we achieve Godhood, they may no longer apply to us. But don't worry - we won't give them up unless it once more serves our interests.

A to More.

Part (1) of your critique actually contains three elements. n the first you impugn my use of "violent metaphors". But nowhere do I advocate aggressive action against others. To the contrary, I repeatedly emphasize the benefits of peaceful cooperation. I say, for example, that "Should others ever join me in my quest for arch-anarchy, I will not fight with them over the spoils of heaven; there ought to be plenty of bliss to go around. Rather I will embrace them as my kin, for all arch-anarchists share the love of life and the thirst for freedom." (p.13) My metaphorical "call to arms" is directed against the metaphorical "reign" of nature and logic. You take this rhetorical flourish too seriously.

You also, in part (1), imply that I ignore the existence of other beings. My demonstrated concern for peaceful cooperation with others shows that I take others into consideration. True, I divide the universe into only my will and its obstacles, but this leaves plenty of room for other beings. I place their wills in one of these two categories. To the degree that they hinder my will, they form obstacles to my will. In practice I treat most others as neutral in regard to these two categories, but because I am as yet ignorant of their effects on my interests. In principle, however, the line may be drawn.

Your last objection in part (1) simply misses the mark. I want to *control* the laws of nature - not blindly destroy them. After a false start, you end up recognizing this. I gather, then, that you are objecting solely to my tone of voice. Lighten up! The transfer of information should be *fun*. So what if I shout and sing and giggle? Let us limit our debate to *what* I say rather than *how I say it*.

Although you boldly assert that "No limit can be declared final and ultimate," your courage collapses when you defend the principle of non-contradiction in part (2) of your critique. I admit that contradiction presents terrible difficulties, and that as long as we remain short of Godhood we are better off sticking to conventional logic (a point I should perhaps have emphasized in "Arch-Anarchy"). But the day may come when the principle of non-contradiction gets in the way of my will. If so, I will embrace contradiction. Do you find that difficult to imagine? So do I. Our lack of imagination does not, however, prove us wise. As God, I would no doubt see things differently. You already admit the repeal of other elements of conventional logic. What makes you think the principle of non-contradiction sacrosanct?

Do not let your deification of the principle of non-contradiction keep you from deifying yourself. You are far more worthy of Godhood than is the principle of non-contradiction.

In part (3) you criticize my portrayal of Godhood and argue that we should seek an alternative goal: eternal improvement. I am sympathetic to your views, but not at the expense of my own; I find the two entirely compatible. You draw a false distinction between our views because you mistakenly portray God in static terms. Clearly, if God embodies contradiction, God is not static. God's internal dialectic ensures both its rest *and* motion.

You may think this contradiction is a cop-out, but your alternative depends on contradiction as well. You ask that we eternally seek the goal of perfection *without wanting to achieve that goal*. To achieve perfection would, on your view, doom us to stagnation.

I think there is a synthesis here, however. I would have us seek a perfection that embodies process; you would have us embody a process that seeks perfection. Both are final ends. Both rely on contradiction. I have chosen to emphasize one aspect of Godhood; you have chosen to emphasize another.

You conclude part (3) by correctly pointing out the dangers of worshipping God. That is a good reason for preferring (what I take to be) your version of God, particularly when proselytizing - it is less susceptible to abuse. Your apt warnings do not discredit "Arch-Anarchism", however. Others may debase themselves by praying to "higher" beings, but I do not. I raised the possibility of worshipping the God-I-might-become only to discredit the notion. I am not afraid of the dangers of worship because the very drive that leads me to seek Godhood simultaneously renders me immune to voluntary servitude. As an arch-anarchist, I follow only one will: my own.

David Friedman: *The Machinery of Freedom: Guide to a Radical Capitalism.* 2nd edition.

Reviewed by Rob Michels.

Libertarians are all agreed that government should be minimized. Arguments for this view are sometimes ethical: Essentially, no one is justified in initiating the use of physical force against another (though Friedman shows how this simple principle is not adequate). Such arguments are usually developed in the form of principles of self-ownership and private property. Libertarians point out that all or virtually all governmental activities involve the violation of these rights. The other class of arguments against government are practical. Instead of arguing that government is morally wrong, or violates rights, they hold that government is a poor way to achieve the desired goals.

One of the most challenging as well as lasting debates within libertarian circles has been over whether or not, on either of these points of view, there is any room left for government at all. Minimal statists (minarchists) argue that while most governmental functions are not legitimate, some are necessary for a cohesive and lasting society. The functions usually defended by minarchists are national defense, law enforcement, legal adjudication, and (less often) the prevention of monopolies. Anarchists, on the other hand, argue that all necessary social functions could and would be performed if the government did not exist at all.

David Friedman is an anarchist, though not on standard libertarian grounds. He accepts property rights as well as the principle of non-coercion (no one may initiate the use of force), not because the arguments are sound, but because he thinks their conclusions are the same as his. He even goes so far as to say that arguments based on either property rights or a moral axiom "taken literally can be used to prove conclusions that nobody, libertarian or otherwise, is willing to accept." (p.167) He goes on to show that they are susceptible to slippery slope objections. For example, "if I fire a thousand megawatt laser beam at your front door I am surely violating your property rights, just as much as if I used a machine gun. But what if I reduce the intensity of the beam -say to the brightness of a flashlight? If you have an absolute right to control your land, then the intensity of the laser beam should not matter...If everyone has an absolute right to the protection of his own property, then anyone within line of sight of me can enjoin me from doing anything at all which produces light. Under those circumstances, my `ownership' of my property is not worth very much." Libertarians want an orderly society in which individuals can protect themselves and their property from harm. Friedman devotes a chapter of his book showing how vague and slippery is the notion of harm.

Instead of relying on abstract principles, Friedman's strategy is to describe an economic situation which members of a national society would find attractive. This is not a utopian world, just the most attractive one based on practical rather than ethical arguments. He finds these arguments persuasive because they promote individual liberty, economic growth and an overall increase in general utility. As a moralist he is a classical liberal; as a political philosopher and an economist he is a utilitarian.

Throughout the book he deals briefly with some of the consequences of abolishing the government. Drugs would be legal insofar as people used them in a way that did not harm other persons or property. Education would be privatized; anyone who wanted to enter the country could, provided he or she could buy or rent property and otherwise be self-sufficient; and the streets would be owned and operated by private toll road companies. Most of these things would upset most Americans today, but all have worked, and worked well, at one time or another and always more efficiently than when the government has taken over. These issues are standard material in the libertarian literature and are dealt with in greater detail in other books, though Friedman's work is quite good, although brief.

Friedman devotes most of his detailed efforts to the more difficult problems of monopoly, law enforcement, and national defense. For example, the problem of monopoly is usually stated like this: As a company grows, it can afford temporary financial losses that smaller companies cannot. When it faces competition it lowers its prices, forcing the competitors to do the same or lose customers. Because a bigger company can survive price wars better than a smaller one, a company that is big enough can use this strategy repeatedly until it has the entire market. Once it has the entire market, it has no competition and no reason to keep its prices low. If this company produces a sufficiently important commodity, say oil, then it can in effect force us to do its bidding or do without oil.

There are, however, several responses to this argument. First, a company can only grow if it is efficient. The efficiency of a firm increases up to a certain point after which it decreases. The increase reflects mass production. But there is a breaking point at which a company has become too large. The leaders become too far removed from what is happening at the bottom and become more likely to make unwise decisions. This is why some companies like General Motors break themselves into semi-autonomous divisions in order to mimic the more efficient smaller companies which can take full advantage of mass production without overextending themselves.

But let's say that this breaking point coincides with the total size of the market so that while an increase in size would decrease efficiency, it is not necessary for the company to become any larger to control the entire market. Here, the company can take advantage of mass production and can make profits by producing at lower costs than can anyone else. Friedman asserts that apart from the fact that this is extremely rare, a company that found itself in this position would still have to keep its prices low as though

there were other competitors, otherwise new companies would form and beat out the larger company. Economists call this “potential competition”. Without government regulations, anyone can enter the market. Knowing this, and enjoying their position, a large company will go to extreme lengths to keep their prices low to prevent the potential competitors from winning customers. Government intervention disrupts this situation and has in the past caused, rather than eliminated, monopolies. Government regulations make it more difficult for a new company to enter the market and hence lower potential competition, allowing big companies to become larger and less efficient.

When the market is filled with companies that are operating efficiently, the economy improves and overall utility increases. Friedman’s strategy in responding to the issue of free market law enforcement and national defense is similar, though I will not give details here. His arguments are always practical rather than ethical, and supported by strong economic principles and examples.

One of the most important themes throughout the book is that anarchist theory is not a call to arms or a movement of chaos, as some people have come to believe. The word “anarchy” has been a misused word for some time now, though people like Friedman are doing much to rectify the situation. Anarchist theory promotes order through economic rather than political means. It promotes individual liberty and general utility. To the degree to which people understand this, they will see that free markets are in their best interests. People are willing to pay for what is in their best interests and this fact is one of the fundamental tenets of free market anarchism. What Friedman has done is to have shown that free market responses to political situations are not only feasible, but more attractive than governmental responses. This, he shows, is true for even the most difficult problems. The task, then, for the libertarian/anarchist is primarily one of education. The way to do this is by sharing knowledge and ideas - a very extropian task indeed.

Additional comments by Max More.

Friedman's approach to free market anarchism, or stateless spontaneous voluntarism, is markedly different from that of another major libertarian theorist, Murray Rothbard. In his books *For a New Liberty* and *The Ethics off Liberty*, Rothbard describes a libertarian Legal Code which is to provide the rules which each private protection agency will enforce. Apparently the Code will be exactly the one that Rothbard prefers. The private protection agencies are to compete on the basis of price, type of coverage, and quality of service, but they will all abide by the same rules.

Rothbard's approach is surprisingly anti-market. It fails to appreciate the workings of real market institutions and pressures, and thereby stands condemned as viciously abstractionist. The content of the law is a commodity, and will be determined by competing preferences as will anything else in the market. One virtue of Friedman's analysis of the workings of a libertarian anarchy is that it doesn't rely on any such Platonistic legal code which we just hope that everyone will agree to enforce.

Clearly for a system of competing laws and enforcement agencies to work, there must be *some* commonality of values in the society (however a "society" is delimited in a nationless system). If very many people absolutely refused to bargain and accomodate the interests of others - a major group of religious fanatics for instance - there would necessarily be violent conflict rather than peaceful resolution of disputes whenever opposing factions of dogmatists violated each others' rules. This is no objection to an anarchistic, non-monopolistic, spontaneous voluntarism however: Any society has to face this possibility. We can see societies around the world and throughout history where the existence of statist arrangements provided no solution to this problem. In fact, once power is concentrated in statist structures, one fanatical group has only to seize power to do enormous damage. Stalin and his socialists and Hitler and his National Socialists are cases in point. At least a spontaneously ordered society has no such concentrations of power available for seizure.

According to Friedman's description, in his "rational anarchy" you can protect your own rights, but you are far more likely to subscribe to a private protection agency that, for a yearly premium, will protect your rights. As in any sector of a free market, these agencies will have market incentives to provide an efficient and unintrusive service at a low cost. Unlike our current police monopolies they will have powerful reasons to treat their customers well, since their income depends on doing this. A policeman who is paid through compulsory taxation-extortion need not restrain his racism when dealing with those he despises. An employee of a free market agency will be more tightly constrained - though no system can guarantee prevention of all abuses.

What happens if I accuse you of having stolen my car? Won't our agencies (if we subscribe to different agencies) fight each other? Friedman points out that this is economically irrational; agencies that did this would have to pay their employees much high wages, and would probably be unpopular with persons caught in the crossfire. Instead, we can expect the agencies to go to arbitration. It is in the interests of protection agencies to agree on an arbitration agency *before* disputes arise whenever possible. Clearly they will choose an agency agreeable to them both. they will pick agencies with a reputation for fiar dealing and rapid resolution of disputes. We could expect a far more efficient legal system than our current backlogged and cumbersome one.

What if the two agencies disagree on what rights their clients have? I refer you to Friedman's incisive discussion of how, even in cases where, say, one side favors capital punishment and the other opposes it, their are market incentives for a peaceful resolution to the mutual benefit of the parties involved. I commend *The Machinery of Freedom* as a rare book that is at once visionary and realistic.

Extropian Resources

Compiled by Max More

[Suggestions for other inclusions are welcomed]

BIOSTASIS ORGANIZATIONS:

Alcor Life Extension Foundation: 12327 Doherty St., Riverside, CA 92503, Tel: (800) 367-2228, in California (714) 736-1703. I believe this to be the largest and most sophisticated of the cryonics organizations. Their monthly magazine CRYONICS contains many articles of excellent quality, covering not only biostasis and life extension but other issues of relevance. ($25/year)

American Cryonics Society: Suite 368, 870 Market Street, San Francisco, CA 94102. Their magazine is AMERICAN CRYONICS. $25/year.

The Immortalist Society: 24443 Roanoke, Oak Park, Michigan, 48237. Tel: (313) 548-9549. Publishes THE IMMORTALIST. Run by the father of cryonics, Robert Ettinger.

Alcor-UK: c/o Luigi Warren, No.6, Townend House, High Street, Kingston, Surrey KT1 1NA, England. The major European group, I was one of the founders in 1986, it has recently received a major financial and organizational boost and now has a facility and equipment.

The Society for Venturism: P.O. Box 458, Wrightwood, CA 92397. A cryonics "religion" (really a transhumanism) which holds events, publishes Venturist Monthly News, promotes cryonics in the media, and is run by the very able and energetic Dave Pizer and Mike Perry.

The Order of Universal Immortalism: Address as for the Venturists. A new organization, run by Mike Perry, which "advocates the viewpoint that the dead, even those who were not frozen or otherwise preserved, might ultimately be resurrected through a scientific process."

Lifepact: P.O. Box 18698, South Lake Tahoe, CA 95706. Focuses on preparing for the future reanimation and rehabilitation of biostasis patients.

Federation of Cryonics Societies (FOCUS): Newly formed group which seeks to encourage cooperation between cryonics societies in order to protect their mutual interests. Address as for Lifepact.

Reanimation Foundation: c/o Saul Kent, 16280 Whispering Spur, Riverside, CA 92504. Set up to help members of cryonics societies establish secure trust funds in Lichtenstein, so they can better provide for their suspension and reanimation costs.

Citizens for an Extended Lifespan (CEL): 9149 Sepulveda Blvd., Suite 139, Los Angeles, CA 90045. Intended to protect and advance the legal status of cryonics.

OTHER LIFE EXTENSIONISTS/IMMORTALISTS:

Life Extension Foundation: P.O. Box 229120, Hollywood, Florida 33022-9120. (800) 841-LIFE. Produce the excellent LIFE EXTENSION REPORT which will supply you with up to the minute information on life extension research advances. $27/year. Membership of the Foundation ($50/year) entitles you to the Report and to a 25% discount on the products of Life Extension International (see below).

Life Extension International: 1142 W. Indian School Road, Pheonix, Arizona 85013. 1-800-678-8989. A comprehensive source of vitamins, minerals, and other life extension supplies.

Vitamin Research Products: 2044 Old Middlefield Way, Mountain View, CA 94043-9971. (800) 877-2447. Another excellent source of supplements.

Life Services Supplements: 1-(800)-542-3230. Another supplier of supplements.

Longevity: From the publishers of OMNI, a glossy magazine with some good articles. Available at the newsstand, or from LONGEVITY International, Ltd., 1965 Broadway, New York, NY 10023-5965. (212) 496-6100. $3/issue; $21.95/year.

Pharmaceuticals International: 539 Telegraph Canyon Road, Ste. 227, Chula Vista, CA 92010-6436. 1-800-365-3698. Supplies life extending and brain boosting drugs, some of which cannot be bought in this country even with a prescription. PI is allowed to import these and you can buy them without a prescription. Centrophenoxine, Hydergine, Piracetam, Isoprinosin, Retin-A, Ribavirin and others.

International Products: Beckstrasse 27 D-3000, Hannover 91, West Germany. Similar to Pharmaceuticals International.

Interlab: P.O.Box 587, Newport Pagnell, Bucks, MK16 8AA, England. Sells Piracetam, Lucdril, Diapid, Hydergine,

Deprenyl, etc. Some prices are lower than those of Pharmaceuticals International, and some lower. Each company seels some items not available from the other.

Offshore Medical Therapies: P.O. Box 833, Farmingdale, NY 11737. Quarterly newsletter, $19.

Durk Pearson & Sandy Shaw's Life Extension Newsletter: Box 92996, Los Angeles, CA 90009. $34.95/12 issues. Information and comment on aging research, psychobiochemistry, nutrition, addiction, reduction of health risks, negative effects of government agencies such as the FDA on biomedical freedom of choice, Q&A.

University of California, Berkeley Wellness Letter: P.O. Box 420148, Palm Coast, Florida 32142. Good source of information on health issues. $20/year (29 in Canada), 12 issues.

Brain-Mind Bulletin: Interface Press, P.O. Box 42211, 4717 Figueroa St., Los Angeles, CA 90042. $35/year. Summarizes reports on research into health and psychology, and mind/brain-body connection. Expensive for what you get (8 pages).

Cognitive Enhancement Research Institute: John Morgenthaler, CERI, PO Box 483, Santa Cruz, CA 96061. $1 for newsletter which I haven't yet seen. Apparently covers intelligence augmenting drugs and nutrients.

EXTROPIAN SCIENCE FICTION:

Lifequest: c/o Imladris Corporation, P.O. Box 18690, South Lake Tahoe, CA 95706. "Fictional works about life extension, including suspended animation, elimination of aging and progressive self-transformation." Good and improving quality of stories. $3 for the current (and, sadly, last) issue.

ANALOG: $2/issue, $25.97/year. P.O. Box, 7061, Red Oak, IA 51591. Wide-circulation magazine has long been printing pro-liberty stories, and has recently been publishing a lot of nanotech and immortalist stories, including the classic "The Gentle Seduction" by Marc Stiegler (April 1989).

Prometheus: 89 Gebhardt Road, Penfield, NY 14526. The newsletter of the Libertarian Futurist Society. $8/year ($10 overseas) for 4 issues. Reviews libertarian science fiction and bestows the Prometheus Award.

SPACE:

National Space Society: 922 Pennsylvania Avenue, SE, Washington, D.C., 20003-2140. Write them for information about membership and local groups.

American Rocket Company: 847 Flynn Road, Camarillo, CA 93010. (805) 987-8970. Private rocket launch company.

OTHERS:

The Foresight Institute: Box 61058, Palo Alto, CA 94306. (415) 324-2490. Fax (415) 948-5649. A minimum contribution of $25/year will get you Foresight Update - a brief (12pp) but excellent source of advances in nanotechnology and related fields (including molecular computing, virtual realities), and discussions of the likely shape of a nanotech powered society. Highly recommended.

Claustrophobia: 5047 SW 26th Dr., Portland, OR 97201. Covers space and life extension from a libertarian viewpoint. Will be ceasing publishing before very long, but take a look while you can. You may want back issues.

Singularity: 89 Massachusetts Avenue, Suite 199, Boston, MA 02115. Edited by Ron W. Evans. Produced by people with similar interests to us - immortality, improved posthuman bodies, etc. The first two issues have also featured interesting articles on experience with madness - this may not appeal to all. Recommended. (Latest issue - Spring 1990 - was number 2.) $6/year, $1.50/issue.

Mondo 2000: Fun City MegaMedia/Mondo 2000, P.O. Box 10171, Berkeley, CA 94709-5171. $24/six issues. So far irregularly published glossy magazine, covers some similar topics to EXTROPY. The latest issue (July/August 1990) was quite impressive: New smart drugs, artificial life, in depth on virtual reality, and much more. Recommended.

Boing Boing: P.O. Box 12311, Boulder, CO 80303. $10/4 issues. Cyberpunk, nanotech, brain toys, self-modification, reviews. Three enjoyable issues so far ($3 each).

Going Gaga: Gareth Branwyn, 2630 Robert Walker Pl., Arlington, VA 22207. (703) 527-6032. $8/year (4 issues). No.6 focussed on cyberpunk and virtual reality. #7 will be a cassette issue on psychedelics.

Whole Earth Review: No.67, Summer 1990. $5 from 27 Gate Five Road, Sausalito, CA 94965. Good issue, including information on Biosphere II, Artificial Life, a debate for and against nanotechnology (Drexler vs Garfinkel), Virtual Reality...

Liberty: Liberty Publishing, P.O. Box 1167, Port Townsend, WA 98368. $35/12 issues. The best libertarian journal for serious and non-dogmatic discussion. Highly recommended. Has many of the best libertarian writers.

Loompanics Unlimited: P.O. Box 1197, Port Townsend, WA 98368. Catalog of books that are hard to find elsewhere, on subjects like life extension, science and weird science, "reality creation", drugs, beating "the State", self-defense. The reviews are fun to read even if you buy nothing. Vital!

Eden Press Privacy Catalogs: Eden Press, P.O. Box 8410, Fountain Valley, CA 92728. Like the Loompanics catalog, but less diverse.

Factsheet Five: c/o Mike Gunderloy, 6 Arizona Avenue, Rensselaer, NY 12144-4502. $2/issue. Prints capsule reviews of hundreds of small circulation magazines on all kinds of odd subjects, including those you will be interested in. A perfect complement to the Loompanics catalog.

The WELL (Whole Earth 'Lectronic Link): A computer bulletin board filled with odd cybernauts and gripping conversations and information. Info: 27 Gate 5 Rd., Sausalito, CA. (415) 332-4335. By modem: (415) 332-6106. $8/month plus $3/hr.

Science News: 231 West Center Street, Marion, Ohio 43305. $34.50/year (52 issues). Useful and concise summaries of advances in science. Saves the time required to wade through hundreds of pages in other magazines.

Laissez Faire Books: 942 Howard Street, San Francisco, CA 94103. (415) 541-9780. The best source of books by libertarians, free marketeers, and other individualists.

Liberty Tree Catalog: 134 Ninety-Eighth Avenue, Oakland, CA 94621. (800) 872-4866. Sells many good libertarian and individualist books, and has a handy network section which is like a differently-specialized Extropian Resources.

Prometheus Books: 700 East Amherst Street, Buffalo, New York, NY 14245. (800) 421-0351. Publishes and sells books on rationalism, atheism, examinations of "new age" and religious claims, philosophy, psychology, science and the paranormal. I probably found more books per page that I wanted to buy than any other book catalog.

[Thanks to MP-Infinity, Transinfinity Plus, and others who have made sugestions for this data base.]

Contributors

A: Mysterious character of undetermined gender and species. Probably not of this world.

Tom W. Bell: Having acquired his Masters in Philosophy from the University of Southern California, Tom is now starting a law degree at the University of Chicago Law School. Will the law survive in its current form?

MP-Infinity (AKA Mark Potts): is a transhuman-minded futant currently engaged in survival sport while temporarily marooned in the wilds of Oklahoma. Help!

Simon! D. Levy: Divides his time between working at Los Alamos National Laboratory, where he coaxes computers to speak, and studying for his Ph.D in Linguistics at the University of Connecticut.

Rob Michels: Currently beginning studies for a Ph.D in Philosophy at Chapel Hill. One of the extropian gang of three from the USC Philosophy Department.

Max More: (Formerly Max O'Connor.) Editor and co-publisher of EXTROPY; Vice-President, and Media Coordinator, for the Society for Venturism; sign-up agent for Alcor. Max is working on his Ph.D in Philosophy at the University of Southern California. Has been struggling with the Walford High/Low life extension diet for two months.

Michael C. Price: Computer programmer and a Director of Mizar (now Alcor-UK) - the first cryonics organization in Britain.

The contributors are not liable for injured dogmas, mutated thought processes, or infectious memes resulting from a reading of their work.

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The Extropian Declaration:

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