

CRYONICS



3rd Qtr. 1996

A PUBLICATION OF THE ALCOR LIFE EXTENSION FOUNDATION

Volume 17:3

Tim Leary's
last words echo
our own thoughts...

“Why Not?”

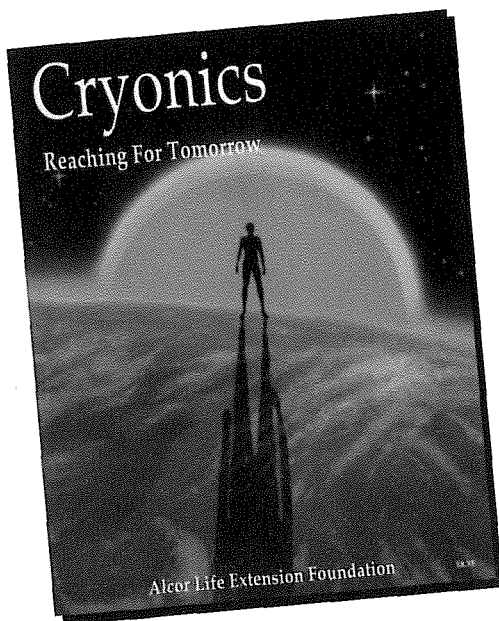
ISSN 1054-4305

\$4.50

“What is cryonics?”

Cryonics is the ultra-low-temperature preservation (biostasis) of terminal patients. The goal of biostasis and the technology of cryonics is the transport of today's terminal patients to a time in the future when cell and tissue repair technology will be available, and restoration to full function and health will be possible.

As human knowledge and medical technology continue to expand in scope, people considered beyond hope of restoration (by today's medical standards) will be restored to health. (This historical trend is very clear.) The coming control over living systems should allow fabrication of new organisms and sub-cell-sized devices. These molecular repair devices should be able to eliminate virtually all of today's diseases, including aging, and should allow for repair and revival of patients waiting in cryonic suspension. The challenge for cryonicists today is to devise techniques that will ensure the patients' survival.



“How do I find out more?”

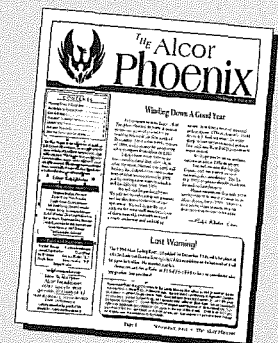
The best source of detailed introductory information about cryonics is *Cryonics: Reaching For Tomorrow*. Over 100 pages long, *Reaching For Tomorrow* presents a sweeping examination of the social, practical, and scientific arguments that support the continuing refinement of today's imperfect cryonic suspension techniques, in pursuit of a perfected “suspended animation” technology.

This new edition features an updated and lengthened chapter on revival, as well as the appendices “The Cryobiological Case for Cryonics” and “Suspension Pricing and the Cost of Patient Care.” Order your copy for \$7.95, or receive it FREE when you subscribe to *Cryonics* magazine for the first time. (See the Order Form on page 40 of this issue.)

For those considering Alcor Membership. . .

If you're intrigued enough with cryonics and Alcor that you're considering Membership, you might want to check out *The Alcor Phoenix*, Alcor's Membership newsletter. *The Phoenix* is a Membership benefit, so it's free to Members and Applicants, but anyone can receive it for \$20/year (\$25/year if you live overseas). It's released 8 times each year, on the “off months” of the quarterly *Cryonics* (February,

March, May, June, August, September, November, and December). *The Phoenix* is shorter than *Cryonics*, but appears twice as often and is mailed First Class. Being a Membership newsletter, *The Phoenix* focuses on Membership issues such as financing cryonics, staff and management matters, developments in Patient Care and Emergency Response, etc. These issues will impact you directly if you decide to become a Member, and may help you make a more informed decision in the meantime.



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ISSUE TO PRESS: July 19, 1996

UP FRONT

BY RALPH WHELAN, EDITOR

Will cryonics work? Will it be possible to revive the suspended, or will the challenge be too great?

It's common (for advocates and critics alike) to characterize the prospects for success in this venture as a binary proposition: it will work, or it will not. It's easy to overlook a third alternative: that future technology will be equal to restoring our patients to *function*, but unable to restore the connections within their brains to the exact configurations that once defined them.

Given the shortcomings in our existing suspension technology, it's quite possible (and some would classify it as a near certainty) that myriad, minute portions of the brains of at least some of our patients have essentially been obliterated.

Leaving the question of how much "personality loss" is *too* much for the identity scholars, Xerox PARC researcher Tad Hogg investigates the more practical matter of what steps we all can take *now* to assist our friends in the future with the daunting task of putting us back together. Look to "Information Storage and Computational Aspects of Repair" (pp. 18-25) for a jumpstart on how to go about documenting the most important aspects of your personality.

You may just thank yourself later.

Letters to the Editor. . .

Dear Mr. Whelan:

If a cryonicist isn't the very definition of a technological optimist, then I don't know who is. Thus I was surprised to see Steve Bridge say, in his book review in the latest *Cryonics*, that we may not "overcome nature" and that "tiny creatures. . . evolve inside our bodies. . . perhaps as fast as we can design counter measures. To quote [Eric] Drexler, "Once biologists have described normal molecules, cells, and tissues, properly programmed repair machines will be able to cure even unknown disease. . . . repair machines need only look for differences and correct them. . . Instead of fighting a million strange diseases, advanced repair machines will establish a state of health." (*Engines of Creation*, 1986, pp. 113-114) And will maintain that state of health, I would add.

Steve's argument seems to imply that blind evolution will defeat us no matter how technologically advanced we get. I would disagree. Once we can arrange and rearrange atoms at will, I don't think blindly evolving predators will stand a chance. (Maliciously designed nanomachines are another story, of course.) I agree with

Steve's point that some plague or other could hurt our technological progress in the near future, which is all the more reason to make sure we will stick around in one form or another until cell repair is available. I see no reason, though, to be gloomy about viruses, plagues and similar beasts once we have cell repair capability.

I think Steve does a great job as our chief spokesman and usually find myself in full agreement with his positions. In this case, though, I think our legion of mostly ill-informed critics have enough ammunition already without us providing more for them. I'm not suggesting that we try to sweep negative information under the rug, just that we should accept and promote any and all rational reasons to be positive and hopeful. And we should always keep in mind that an optimist is what a pessimist calls a realist.

Best regards,
Wesley Du Charmé

PUBLICATION NOTES

Cryonics is the quarterly publication of the Alcor Life Extension Foundation

Editor: Ralph Whelan

Volume 17:3 • Issue #171 • 3rd Quarter, 1996 • ISSN 1054-4305

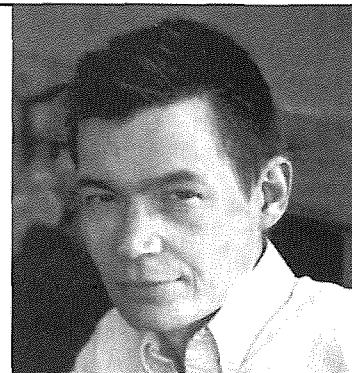
(Most of the first 160 issues—September, 1977 through December, 1993—were published on a monthly basis.)

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About the Cover

The cover of this issue was designed by Ralph Whelan.

Eternal Life Cosmology and its Alternatives

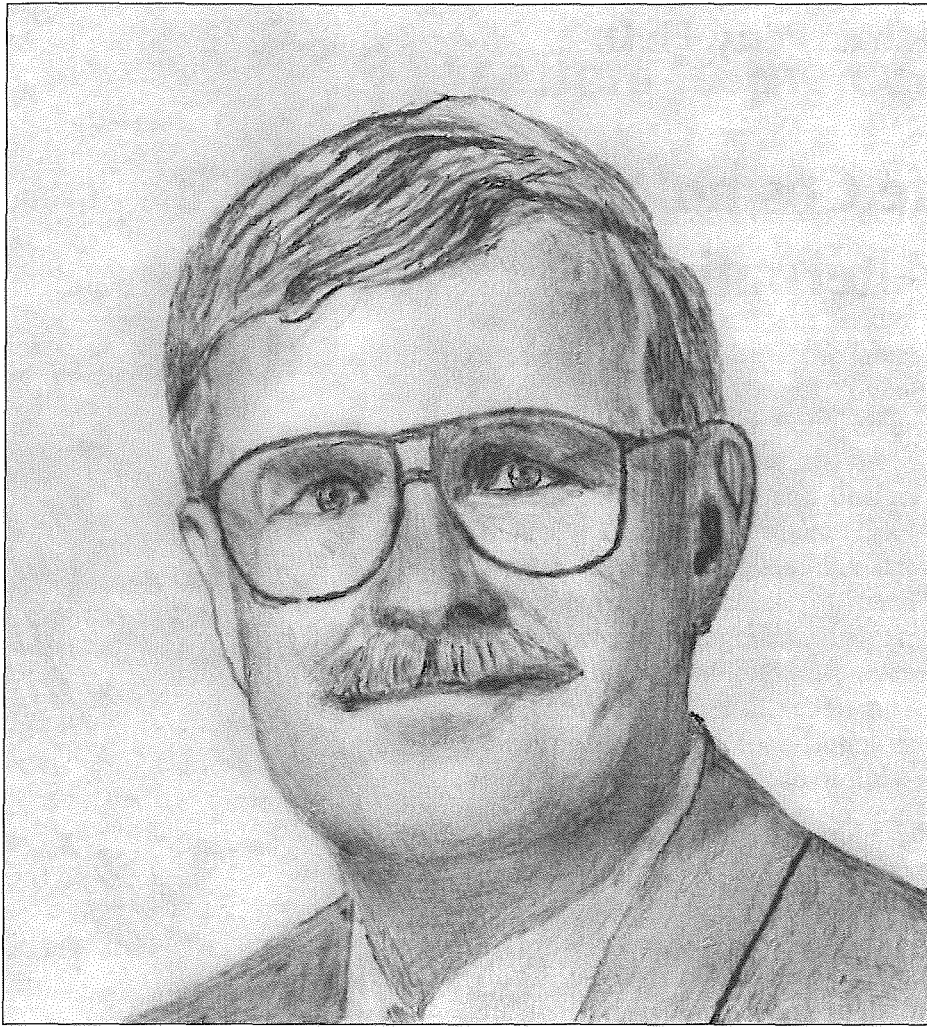


Most immortalists, I think, cherish a hope in the back of their minds that the universe will, in the end, prove benign enough to support true eternal life. We would like to feel some confidence that, after the more immediate issues such as aging, diseases and/or uploading are settled, science will continue its progress. Ultimately, we hope to attain a kind of technological heaven—or at least an unlimited opportunity to develop further. The issue of cosmology will have to be faced eventually if we hope to become immortal, though there are more pressing matters to worry about now. There is one way, however, that cosmological issues are important here and now too. Points of view, even about matters that are remote from everyday experience, can have a profound effect in such areas as religion, philosophy, politics, scientific research, and attitudes among the public at large about what various groups are up to—including ourselves. Perceptions of issues of all kinds, and whether and how these issues should

be addressed, will depend on what people think about the bigger picture.

Here I will discuss certain perceptions of a larger issue—the ultimate fate of the universe. There are three principal opinions I will consider, one optimistic, the two others pessimistic. In the optimistic scenario endless progress is possible, in the other two progress is limited and eventually undone. Endless progress allows the further possibility of immortality; its absence precludes it. As yet, it is unclear which of the three alternatives (if any) may actually hold—this must await our discoveries. I will briefly consider the issues in physics that are involved; however, the main focus will be not on the various scientific theories themselves, but the effect some of these have had in relatively recent times. In one case the effect was especially profound and unpleasant. Much of my information is drawn from *The Physics of Immortality* by Frank Tipler, where the subject of cosmological eschatology—the fate of the

“Ultimately, we hope to attain a kind of technological heaven — or at least an unlimited opportunity to develop further.”



Physicist Frank Tipler has argued the scientific case for immortality.

universe—is treated at length.¹

We'll begin with one of the negative scenarios, the Heat Death. It is a basic principle of physics that in any closed system the amount of disorder or entropy increases—the system “runs down.” In the closed systems we can create in the laboratory—by thermally insulating and sealing off a volume of space and considering what happens inside—a uniform temperature is eventually reached, with no usable energy. This will happen regardless of what may be going on initially—electrical or chemical activity, for instance, or a clock that is ticking or a motor that is running using its own fuel supply. After this, essentially nothing happens. A potential energy *difference* is required,

between some point and another point in the space, to derive any useful work. (Without a temperature difference, or an equivalent mechanism of energy storage, all energy exists only as unusable heat, hence the term “Heat Death.”) Applying this to the universe as a whole (and the universe, certainly, is thermally insulated from whatever may exist outside it), it seems that everything must eventually run down, and reach a uniform temperature. Given the present vast size of the universe, which is mostly empty space far from any stars, the available energy (mainly from nuclear fusion in stars) would not be enough to maintain any but a very small uniform temperature. The stars would burn out, and things would

freeze and grow very cold. Life too, since it requires energy to function, must cease, never to revive again. This, then, is the Heat Death, a gloomy future scenario first predicted by the physicist Hermann von Helmholtz in 1854. (A more recent, alternative form of the Heat Death is that the universe collapses into a fireball—the constant temperature then is very high because the volume of the universe has become tiny.)

The Heat Death scenario exerted a profound and depressing effect on the thinking community, particularly those inclined to hope for continued progress. Charles Darwin, for example, who was initially hopeful about the prospect of betterment through the evolutionary process that had operated so long in the natural world, found the Heat Death most troubling. “[B]elieving as I do that man in the distant future will be a far more perfect creature than he now is, it is an intolerable thought that he and all the other sentient beings are doomed to complete annihilation after such long-continued slow progress.”²

H. G. Wells, in his 1895 story, *The Time Machine*, gives us a graphic picture of conditions as seen by an imaginary visitor to the far future, when the Heat Death is visibly approaching. (The earth's rotation has slowed through tidal friction, leaving the sun, reddening and swelling as it burns down, frozen in place in the sky.)

“So I traveled, stopping ever and again, in great strides of a thousand years or more, drawn on by the mystery of the earth's fate, watching with a strange fascination the sun grow larger and duller in the westward sky, and the life of the old earth ebb away. At last ... the huge red-hot dome of the sun had come to obscure nearly a tenth part of the darkling heavens. Then I stopped once more, for the

crawling multitude of crabs had disappeared, and the red beach, save for its livid green liverworts and lichens, seemed lifeless. And now it was flecked with white. A bitter cold assailed me. ... From the edge of the sea came a ripple and whisper. Beyond these lifeless sounds the world was silent. Silent? It would be hard to convey the stillness of it. All the sounds of man, the bleating of sheep, the cries of birds, the hum of insects, the stir that makes the background of our lives—all that was over.”³

The philosopher Bertrand Russell well expressed the sense of anguish in 1903:

“That man is the product of causes which had no prevision of the end they were achieving; that his origin, his growth, his hopes and fears, his loves and his beliefs, are but the outcome of accidental collocations of atoms; that no fire, no heroism, no intensity of thought and feeling, can preserve an individual life beyond the grave; that all the labors of the ages, all the devotion, all the inspiration, all the noonday brightness of human genius, are destined to extinction in the vast death of the solar system, and that the whole of Man’s achievement must inevitably be buried beneath the debris of a universe in ruins—all these things, if not quite beyond dispute, are yet so nearly certain that no philosophy which rejects them can hope to stand. Only within the scaffolding of these truths, only on the firm foundation of unyielding despair, can the soul’s habitation henceforth be safely built.”⁴

These sentiments were echoed as recently as 1977 by physicist Steven Weinberg: “... this present universe ... faces a future extinction of endless cold or intolerable heat. The more the universe seems comprehensible, the more it also seems

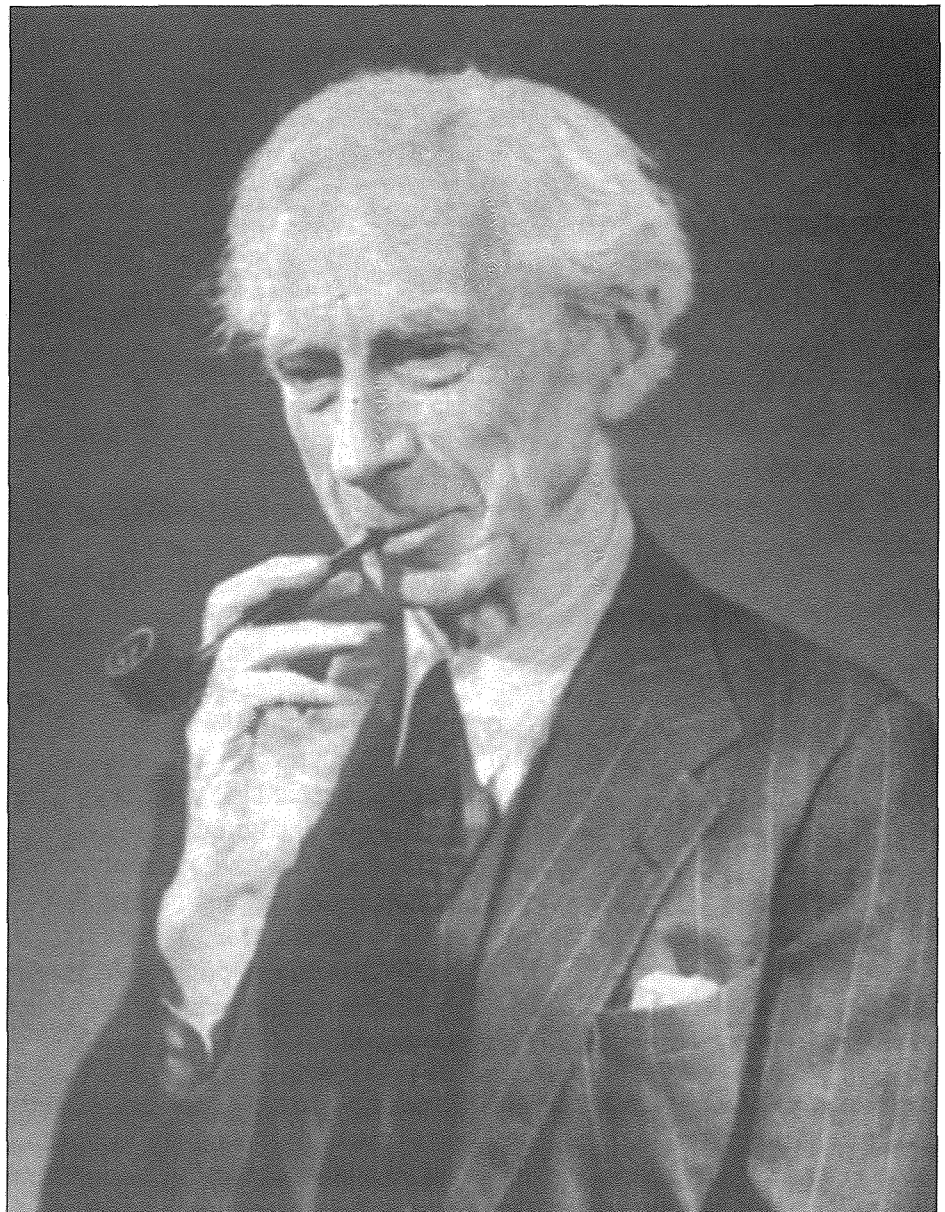
pointless.”⁵

It is no longer true, however, that the Heat Death or some other bad outcome seems “nearly certain”—some possible loopholes will be noted later. Let’s go on now to the other pessimistic scenario.

This is known as the Eternal Return. Where the Heat Death asserts that things simply run down (or burn up) and stop, and life dies out, the Eternal Return has life and events continuing forever, but *repetitively*. History has only a finite number of

episodes before the whole process starts over again, and continues on an endless treadmill, every event being repeated infinitely often. In one version, the *entire* historical process is exactly repeated over and over like an endlessly rerun movie, in others, the different episodes, finite in number, are repeated but the order and arrangement can vary.

The Eternal Return is an ancient idea, being embraced, for example, by the Stoics some 2,000 years ago. It was given new life in the nineteenth century by the newly developed phys-



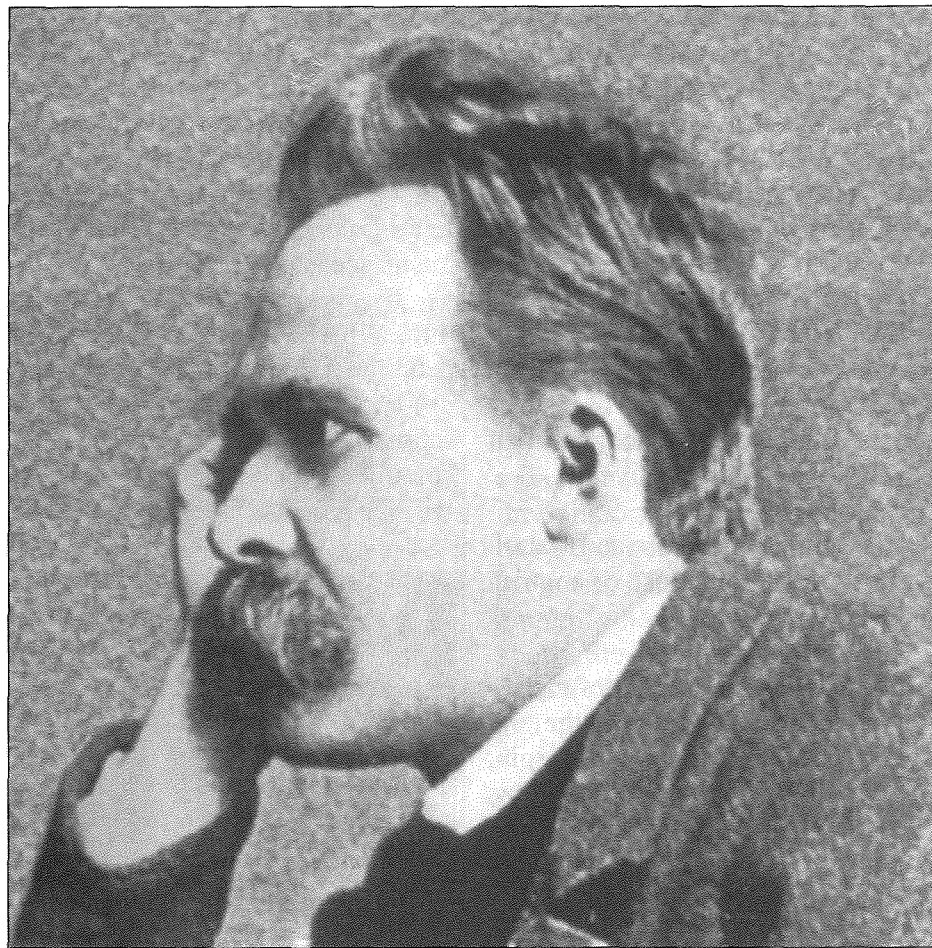
Bertrand Russell believed in the Heat Death, and despaired.

ics, and was adopted by philosophers such as Friedrich Nietzsche, who spent several years studying physics so he could state and defend the following argument:

"If the Universe may be conceived as a definite quantity of energy, as a definite number of centers of energy—and every other concept remains indefinite and therefore useless—it follows that the Universe must go through a calculable number of combinations in the great game of chance which constitutes its existence. In infinity, at some moment or other, every possible combination must once have been realized; not only this, but it must once have been realized an infinite number of times."⁶

The Eternal Return became the cornerstone of Nietzsche's whole philosophy. Though this was in the nineteenth century, the advent of more modern physics, and such concepts as quantum indeterminacy, did not destroy the possibility of the Eternal Return. Instead it was strengthened through "recurrence" theorems which showed that, under fairly general circumstances, a repeat of conditions really would occur. (Fortunately, there are some loopholes here too.) But returning to Nietzsche, the consequences of the Eternal Return were profound and not so different from those of the Heat Death. There could be no overall progress in life, hence no overall goal; science and technology were ultimately futile and misled people by creating false optimism, truth was a matter of opinion only, and depended on culture and race. "The *goal of humanity*," Nietzsche said, "cannot lie in the end," (which would follow if progress could go unhindered) "but only *in its highest specimens*."

Nietzsche was not a racist, but the idea of furthering the "highest



Friedrich Nietzsche argued for the Eternal Return.

specimens" was taken over by those who were—the diabolical Nazis. They championed Nietzsche (who died in 1900, well before the advent of their movement) as a spiritual father even while pressing his ideas beyond the limits he intended. They engulfed the world in war and committed unspeakable atrocities in the name of "purifying" the world of "inferior races" before their opponents, united against them, brought their destruction.

We cryonicists frequently encounter hindrances that harken back to the idea of the Eternal Return. Death is "natural," our critics say, "a necessary part of the life cycle," which must be viewed "constructively," because it brings "renewal." Death from "natural causes" is not seen as the evil that applies to other

forms of death. To us, though, it's still death—and, we think, quite possibly avoidable through cryonics and certainly addressable scientifically. It's a worse problem really, since more people die "naturally" than any other way.

Other influences of the Eternal Return idea are shown in the resistance to progress that seems to accompany all our advances. One extreme can be seen in the twisted individual known as the Unabomber, who advocates a return to a preindustrial society and shorter lifespans, and used terrorism and murder in a desperate ploy to gain a hearing.

Let's turn now to the optimistic scenario, which we may call Eternal Progress—life advancing (overall) without limit. Like the Eternal Return this is an ancient idea. It is advo-

cated in the two major world religions, Christianity and Islam, both of which promise eternal life and happiness to the faithful. Early Christians, in particular, recognized the conflict with their doctrines and the Stoics' Eternal Return. Origen (3rd century A.D.) noted how the Eternal Return contradicted the Christian doctrine of free will, and that it also seemed impossible based on probability arguments.⁷ To Augustine (5th century) the idea was anathema because Christ would have to die more than once for the sins of the world.⁸

This, however, does not address the issue from the standpoint of modern physics. In fact, quantum mechanics provides for a recurrence of states under a rather wide variety of conditions. If a closed system occupies a bounded volume of "phase space" (a combination of the spatial volume the system occupies and the momenta of its particles) quantum states will recur—guaranteeing an Eternal Return. It is not clear, however, that the universe is such a system, even if it is finite in spatial

extent. So there is hope (but only hope at this point) that the Eternal Return does not apply to our own universe!

As for the Heat Death, this too is not guaranteed. The two versions of it discussed above, one in which things become very cold and remain spatially extended, the other in which the universe collapses into a tiny volume and things get very hot, both contain loopholes that might allow an infinite amount of information processing. (In particular, processing can go on in near absolute-zero conditions, using thermodynamically reversible computations.) An infinite amount of processing, in turn, would mean, under a reasonable scenario, an infinite amount of subjective time for intelligent beings—Eternal Progress and a reasonable prospect of immortality—though life might have to adapt considerably to survive.

Russell, we noted, had been worried that "man is the product of causes which had no prevision of the end they were achieving." And indeed, this appears so—discounting the theistic idea that life was intelligently created. We were created unconsciously, by a sort of complicated accident. Yet this does not, in itself, preclude the possibility of Eternal Progress or personal immortality. That will depend on our own determination and actions—as well as the universe we are in.

At this point a further comment seems in order about the various cosmological possibilities. It should not be thought that Eternal Progress or the Eternal Return or Heat Death exhaust all the imaginable alternatives. What the universe may hold in store we are not yet in

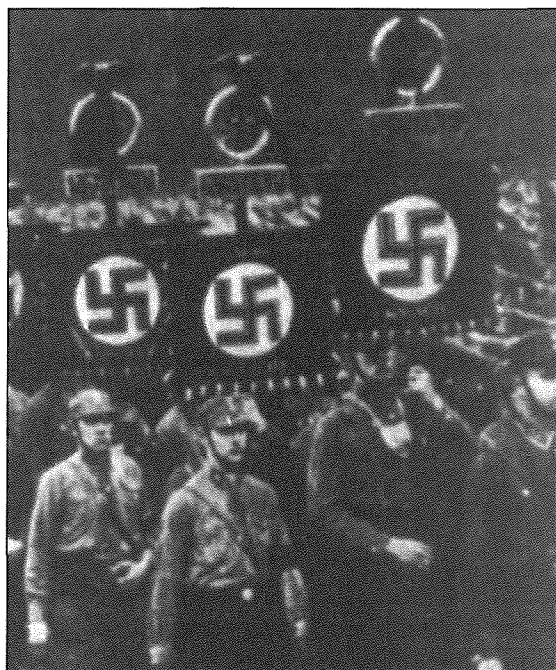
a position to judge, though more is being learned all the time.

In closing it is worth noting that many cryonicists are skeptical that true immortality will be attainable (others, myself included, are more optimistic). There is general agreement, however, that at least lifespans can and ought to be extended. Life, fundamentally, is a good thing. We're willing to wager that more is better than less.

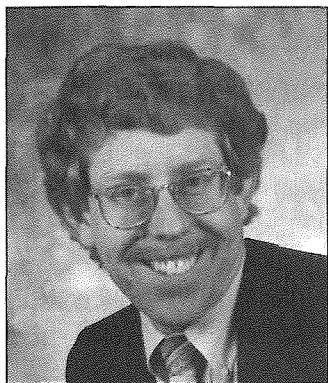
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Material quoted or referred to in *The Physics of Immortality* (all from chapter 3) is noted by "PI" followed by page number.

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3. Wells, H. G., "The Time Machine," *Three Prophetic Novels* (Dover 1960) 329.
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5. Weinberg, S. *The First Three Minutes* (Basic Books 1977) 149, PI 70.
6. Nietzsche, F. *The Will to Power* #1064 (tr. Levy 1910), PI 78.
7. Origen, *On First Principles* bk 2, 3.4.
8. Augustine, *The City of God* bk 12, ch 14, PI 76.



The swastika, an ancient symbol for the Eternal Return, became the emblem of Nazism.



New Policies on using Trusts and Real Estate for Suspension Funding

It has always been our preference that Alcor members' suspension funding be provided through life insurance, cash prepayment, or cash investment accounts designated "In Trust For" or "Pay on Death to" Alcor. These methods are simple to set up and provide uncomplicated and rapid payment to Alcor after the member's suspension. However, since many members have assets in their estates that they wish to protect via a trust, Alcor is willing to accept suspension funding transferred to Alcor through a properly formulated trust.

This trust funding may be in the form of life insurance, cash, investment accounts, real estate (with certain restrictions discussed below), or some other form deemed acceptable by Alcor's officers.

In the past we have not had enough experience with trusts to provide members with clear advice on what trust arrangements are acceptable or required. Now we think we can pro-

vide at least an initial policy to go by. I guarantee the specific language will change over the years as we understand trusts better (and probably as we gain more painful "learning experiences"); but the current policy should go a long way toward protecting both the member and Alcor.

Real estate as part of suspension funding creates its own set of problems and we are very reluctant to accept property in a funding arrangement. In spite of our preferences, we recognize that some prospective members have a significant amount of their net worth or current income tied up in real property. They may not have any other way to fund their cryonic suspensions. Therefore, we have also written a strict policy on what kinds of real estate arrangements are acceptable.

Please remember that arrangements for suspension funding should not be thought of as "Alcor vs. the suspension member." If we get sloppy on members' suspension fund-

ing, that may eventually endanger their suspensions. Big mistakes may endanger the suspensions of other members as well, including *yours*. Don't ask us to be strict on everyone else, but lenient on you.

Here I give you only highlights of these new Alcor policies so that you have a starting point for considering a trust. **Do not rely on this summary to begin a trust.** For the full text, or any other information on Alcor suspension membership, please contact Alcor Membership Administrator Brian Shock.

Getting Started

Before Alcor will approve suspension funding via a trust, Alcor officers must review the *entire* trust. *Do not sign* a final version of your trust without the approval of an Alcor officer. If the suspension funding provisions are determined to be unacceptable to Alcor after you have already signed the trust, changes to

the trust could be expensive and difficult.

Before you begin preparing a trust or other manner of funding beyond life insurance or cash, you should obtain the full Alcor policies on trusts and real estate and read them carefully. You should also provide these policies to the attorney preparing your legal documents. It will save you legal fees and time if you show the attorney Alcor's policies right from the beginning.

Alcor will not accept a trust that has not been written or edited by an attorney. Trusts are complex and must follow a large number of arcane laws and guidelines. Cryonics only makes the process more complex. If you want to use a trust for suspension funding, hire an experienced estate-planning attorney.

Why Alcor places restrictions on funding

Alcor needs to receive the member's suspension funding as rapidly as possible after the member's suspension. Typically, Alcor incurs from \$20,000 to \$35,000 in immediate bills during a suspension, depending on the complexity of the standby and transport, distance from Alcor, legal expenses, and other complications. Most of these bills are due to Alcor's suppliers and contractors within thirty (30) days.

Expenses of long-term patient care begin as soon as the patient is placed into permanent liquid nitrogen storage, typically about ten (10) days after the transport to Alcor.

Failure of a member to provide proper funding could endanger Alcor's day-to-day operations, our ability to perform suspensions for other members, and even our ability to protect the patients already in suspension. Signing up a member with uncertain or slow-paying funding arrangements is not worth the poten-

tial risk to the other members and to the organization.

Additional concerns for funding which includes real property

Alcor will not accept a proposal in which the member's *entire* suspension funding is based on real property or other non-liquid property. However, Alcor will accept real property as *partial* funding for cryonic suspension, under some conditions.

Alcor's requirements for rapid reimbursement make real property funding problematic for several reasons:

- It is nearly impossible to sell real property within 30 days, even if it is in the Phoenix, Arizona metropolitan area where we can push the sale along. Acceptance of property as suspension funding could therefore endanger Alcor's cash reserves as we pay the suspension bills. A property which could not be sold at all could create an unfunded suspension.

- Property values may fluctuate by large percentages in any locality. A piece of real property valued at \$120,000 today could be worth twice that *or half that* in five years.

Arrangements for suspension funding should not be thought of as "Alcor vs. the suspension member." If we get sloppy on members' suspension funding, that may eventually endanger their suspensions. Big mistakes may endanger the suspensions of other members as well, including *yours*.

- Because of the need to sell the property rapidly, the uncertainty of real estate markets, the expenses and fees associated with sale of the property, and Alcor's inability to definitively determine the current value of a property in advance of sale, the net funding received by Alcor may be much lower than planned, perhaps lower than Alcor's suspension minimums.

Some of the conditions for acceptance of a Trust as suspension funding

- The Trust must clearly state that the member has cryonic suspension arrangements specifically with Alcor and must give very clear indication that getting the member into suspension and paying for the suspension are the *primary* tasks of the Trust. This should include statements to the effect that payment to Alcor is to be given preference over any other creditors or beneficiaries to the extent permitted by law.

- The member's Trust must be set up in a manner such that Alcor will get paid for the suspension as quickly as possible.

- For a neurosuspension, a *mini-*

minimum of \$30,000 in suspension funding must be in a readily accessible form, such as life insurance, cash prepayment, a cash or liquid investment account designated as "In Trust For" or "Pay on Death to"—Alcor, or some other form deemed acceptable by Alcor's officers. Such cash or liquid accounts may be within or

outside of the trust. If these accounts are within the trust, provision must be made for the Successor Trustee (the person who becomes Trustee after the legal death of the member) to pay Alcor this minimum within 30 days after the cryonic suspension of the member.

For a whole-body suspension, a minimum of \$35,000 in suspension funding must be in a readily accessible form, payable to Alcor within 30 days after the cryonic suspension of the member.

■ You must also include a provision that obligates the Trust to pay Alcor an additional \$5,000 (above the normal minimum suspension funding) if the minimum initial payment is not made within 30 days.

■ The Trust must instruct the Successor Trustee to pay Alcor the remaining funding (the amount remaining over the cash minimum) within six (6) months after the date of the member's cryonic suspension.

Additional conditions for acceptance of real property as *partial* suspension funding

■ Other forms of funding would be impossible or would present a severe hardship to the member.

■ The member has placed the real property *within a trust* so that the Successor Trustee (the Trustee who takes office after the member's legal death) will sell the property and pay Alcor as quickly as possible.

■ The equity or unencumbered appraised value of the real property (evidence of appraisal by a certified appraiser must be included) must be twice (2 times) that of the balance of the suspension funding remaining after the "readily accessible" amount.

This is to cover the possibility that the Successor Trustee may be forced to sell the property for less than its appraised value at the time the member was approved for Alcor suspension membership.

The member must assume the risk

If the member asks Alcor to make an exception from its normal policy of requiring life insurance or liquid assets for suspension funding, the member must accept the risk that, at the time of the member's suspension, the assets in the Trust may be inadequate or unavailable to fund his/her suspension on a timely basis.

Alcor cannot accept this as a risk to its other suspended members or to itself. Therefore, if Alcor accepts suspension funding via a trust, the following contingency policy will be in effect:

In the case of a whole-body suspension, if (through no fault of Alcor) the Trust does not pay Alcor the full amount owed within 6 months, Alcor will convert the member's suspended remains to *neurosuspension*.

In the case of a neurosuspension or the case of a whole body patient who has been converted to neurosuspension after 6 months, Alcor may remove the member's remains from suspension if the Trust does not pay the minimum neurosuspension funding in a timely manner.



Advertisements and Personals

Cryonics magazine reserves the right to accept or reject ads at our own discretion, and assumes no responsibility for their content or the consequences of answering these advertisements. The rate is \$8.00 per line per month (our lines are considered to be 66 columns wide). Tip-in rates per sheet are \$140 (printed one side) or \$180 (printed both sides), from camera-ready copy.

EXTROPY: The Journal of Transhumanist Thought #16

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Perhaps We Should Simply Say They May Be Alive

Recently I was interviewed, once more, by a television crew, this time from the Japanese network NHK. And the interviewers asked all the questions such interviewers always ask. The interview went on much as many others have, and since I was the interviewee, I was asked also about the legal case in which I had been involved. (For those who only recently became cryonicists, and may not have noticed at the time, Alcor and I sued for the right of cryonic suspension prior to legal death). Listening to these questions, I came once more to seeking the best answers. One question (as usual) assumed that I would be "dead" when frozen, and once more I started my explanation of the meanings of "death."

Since cryonics began, cryonicists have adopted a variety of terms to describe the state of someone in cryonic suspension. For some time, "deanimated" seems to have been most popular, but later writers on cryonics apparently felt that other terms were better and that word fell out of use. No one claims that anyone suspended by current methods can get out of their capsule and walk away; revival will need medical technologies we haven't yet developed, many of them not yet developed enough to even be specified in detail. At the same time, to those who are not cryonicists, this question of whether or not people in suspension are "dead" still persists.

When someone lies in a coma they are unconscious in a far deeper way than if they had simply dropped off to sleep. Sleep and comas differ in several ways:

during sleep our brains remain very active, though differently from when we are awake, while in a coma patients sometimes show no or very little brain wave activity at all. Moreover, despite all our current medical advances, doctors still remain uncertain about the fate of individual patients in a coma. Will they awaken? Has their brain been irretrievably damaged? If they awaken, will they only be a shell of their former self? Certainly we have many more tests we can apply to those in a coma; often those tests help to answer such questions, but uncertainty remains.

That uncertainty is of the same kind, but not the same degree, as we feel now about the possibility of revival of patients from cryonic suspension. Yet cryonics raises a more profound issue, that of finding a rational definition of death itself. We have a different, far more absolute definition of death than the common one: that if essential information remains recoverable, even if only theoretically, then someone is not dead. *And our definition is better.* any doctor who condemns a patient to burial or cremation on the sole basis of *present* technology assumes he or she already knows all that can ever be known about life, death, and treatment for their patient, an arrogant act which will, someday, be seen as one.

So why not simply say that suspension patients are alive? Yes, that would raise problems, not least of which might be a misunderstanding that they are alive in the present legal sense. Still, by amending that statement only a little, we can escape such problems: say that we

believe they *may be* alive, and for that reason we keep them in suspension. If someone asks you why you choose suspension, you answer that you prefer a condition of uncertain life to one of certain death. Does it require any special name? At most, only for those who study it to find means for revival. (Just as neuroscientists study stroke, or Alzheimer's Disease, or many other brain conditions leading to coma and requiring different treatments, suspension will still need a special name).

Are we gambling when we choose cryonic suspension? Not at all: to gamble means to *voluntarily* take on a risk in the hope of profit. We did not choose to risk death; it is a condition we were born to. We choose suspension because it is the best of two bad choices, both forced upon us. And as immortalists, we dream of the day when people can truly choose.

And Finally, An Addendum

So far, neither Alcor nor any of the other cryonics societies has made a practice of supporting really low temperature *cryobiological* research. Alcor came the closest of all with the work of Jerry Leaf, but systematic exploration of the effects of our methods of freezing patients remains largely undone. And by now, we have (collectively) become much larger than we once were. It is time to think seriously about how the different societies can cooperate on research, even if they cannot cooperate on anything else. Such a possibility hardly

Concluded on page 31

The Cryonic Suspension of A-1600

By Tanya Jones

He was a quiet man. He lived alone in Portland and owned some property. And he was dying of AIDS. As few others have done, he chose cryonic suspension. From this, we know he also had courage.

The case of Patient "A-1600" began much like similar cases in the past, and the complications were of the sort we are increasingly better at managing. First, he was an AIDS patient—infectious control procedures would have to be strictly followed. We go to great lengths to reduce the risk of accidental infection of suspension team members through the use of protective clothing, through (when necessary) reduction of the team to essential personnel only, and through education and simple caution. These procedures have served us well, due largely to the diligence of individual team members. With the information we had, we were certain that we could contain the risk of infection.

The second complication was that the patient wished to fund his cryonic suspension with a trust. Fortunately, Alcor Board Member Carlos Mondragón lived nearby and was willing to assist. In late October, an Application for Cryonic Suspension was sent to Alcor, and by November, the patient's attorney was hard at work constructing a trust to meet Alcor's requirements.

But this process was to drag on for months. In January of 1996, our patient was hospitalized with pneumocystis carinii pneumonia (an opportunistic infection that is common to AIDS patients). He was discharged, and shortly thereafter, his cryonic suspension agreement and anatomical donation form arrived at Alcor.

By late February, time seemed to be getting short. But several important things remained to be resolved. Alcor President Steve Bridge and the patient's attorney had worked out much of the trust, but the bank that was to be Successor Trustee was reconsidering.

On February 27th, Carlos stopped by to visit the patient before traveling to Phoenix for a Board of Directors meeting. Carlos reported that he appeared stable, though he was clearly deteriorating. Two days later, the patient was again admitted to the hospital with pneumonia. Hugh Hixon spoke with the patient's personal physician and was given a prognosis of 2-6 months, with the ever-present caveat of opportunistic infections (i.e., he could go any time).

The next day (March 1), the patient was transferred to the Intensive Care Unit after an anxiety attack and seizure. Although the patient's cryonic suspension arrangements had yet to be finalized, we began investigating flights to

Portland, preparing the facility, and alerting personnel.

He was still in the ICU the next morning, though we were told that the patient was medically stable and only remained because he was agitated and delusional. He had improved by evening and was able to talk with Hugh. Carlos had returned to Portland early, and called around 10:00pm to inform us in no uncertain terms that the situation was quite urgent. The patient had been transferred from the ICU to the skilled nursing wing, but he was hungry for air, febrile, and obtunded. The nursing staff were skeptical that the patient would survive the night, but allowed that a week was possible.

Although the trust arrangements were not yet finalized, Steve Bridge provided the authorization to initiate an emergency response that afternoon by signing the patient's legal documents. Hugh Hixon and I were on the next flight out of Phoenix, due to fortunate last-minute cancellations.

If the patient had not survived that night, we would have been in trouble. We had no local mortician and no source for oxygen. With the most important missing element for this transport being the mortician, this is where Hugh and I concentrated our initial efforts. During the previous week, Carlos had contacted a nearby mortuary about as-



Hugh Hixon (left) and Keith Lofstrom seal the shipping container in preparation for air transport to Arizona.

sisting with the transport. Information about cryonics and the transport procedures was faxed to them on March 1, but no agreement had been reached.

After stopping by the hospital, Hugh and I went to the mortuary. In taking the red-eye, we arrived before proper business hours. The person who answered when we ruthlessly rang the bell, told us that the person with whom we needed to speak wouldn't be in until 8:00pm (a full three hours later). We returned to the hospital and used the time to negotiate for prompt pronouncement and post-mortem stabilization (medication, cardiopulmonary support, and cooling). Based on our previous communication, the patient's physician had ordered that sodium bicarbonate, heparin, streptokinase, and cimetidine be administered after pronouncement. We found the nursing staff understanding and willing to do everything they could to help.

I returned to the mortuary promptly, and I found someone else pulling in at the same time. It was the Funeral Director with whom I'd spoken over the

weekend. At the time, he was optimistic that we could arrange things in time. Inside, he stepped away to make a few phone calls. He returned some time later, apologizing that the final decision had not been his to make, he would be unable to assist us. His supervisors felt that they didn't have enough information about cryonics to make an informed decision. He was able to direct us to the Oregon Funeral Service, thinking perhaps they might better able to help.

I returned to the hospital to update everyone on the development and to call Steve Bridge. Steve tracked down OFS. Theirs is a company which provides contract services directly to mortuaries, and it was not their usual policy to take walk-in traffic. Still, they knew something about cryonics and were interested in hearing my pitch.

I spoke with the owner about the legalities involved in performing a cryonic suspension transport and the shipment of the patient to Arizona. While he looked into the legal specifics, his assistant looked into the logistics of how we would proceed if the word was given. A room was available, and we could set up our equipment in advance. But in the entire city, there was no embalmer available until after 7:00pm. If our patient was pronounced earlier, we would have to wait. (Oregon law has strict requirements about who may operate on legally dead humans.)

Making these arrangements took a while, and they weren't finalized until that afternoon. Our patient's condition was worsening, but only time would tell whether our rushed efforts would be put to the test.

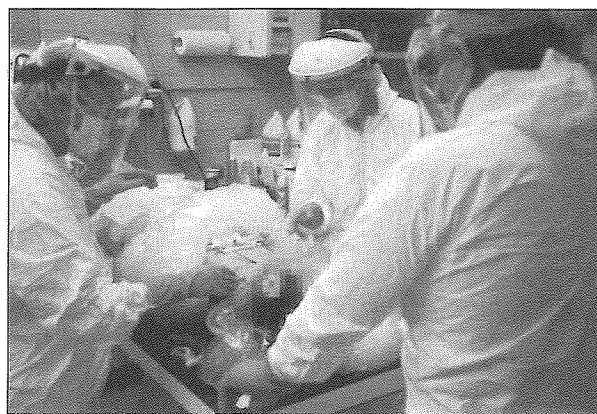
Carlos had been given a copy of the patient's medical record, complete through the morning of March 3rd. After taking a short break for dinner (yummy sandwiches thoughtfully prepared and delivered by a local volunteer), we looked closely at his records. We were sur-

prised to discover that there was a reason for our patient's deteriorating condition—the doctor had ordered all medication, save for comfort, discontinued. This provided the situation with more urgency, and there would be no more time to prepare.

We had a licensed embalmer, medications, surface cooling, manual cardiopulmonary support, washout solution, and protective gear, and we had several local volunteers with us and resting nearby. We did not have a portable ice bath, a heart-lung resuscitator (mechanical CPR device), or a medical-grade pump.

The heart-lung resuscitator was left in Scottsdale. This was a decision based on our lack of an oxygen source and reinforced by cargo limitations of our last-minute flight. The urgency of the mortuary search combined with my lack of experience with an overflowing of volunteers on a transport contrived to push oxygen down a notch on my list. In retrospect, the HLR could have been shipped separately and picked-up by someone else.

Similarly, airline restrictions caused us to leave the portable ice bath behind. Alcor's only intact portable ice bath was the prototype recently constructed by Hugh Hixon. It's a large and heavy box, too unwieldy for effective use. When we left the ice bath in Scottsdale, we knew that the patient would be packed in crushed ice, but the majority of the cooling would come during the blood washout.



To protect the staff, cryoprotective perfusion was performed at our Funeral Director's Mortuary.

As far as the pump is concerned, this was clearly an oversight. When I became aware that I'd left it, Hugh and I decided to work with what we knew was available. We knew that if we found a mortician to assist us, he would have a pump. With caution and adequate preparation, the mortician's pump would be quite effective.

Within the framework of these limitations, we were prepared. Around midnight, Carlos and I looked in on our patient and then went to get some rest. A short while later we were wakened with the news that he had stopped breathing. At 00:45am (1:45am MST) on March 4th he was pronounced.

With the calm professionalism and cooperative disposition of the hospital staff and the funeral service personnel, we expected the release procedure to go quite smoothly. I departed for the mor-

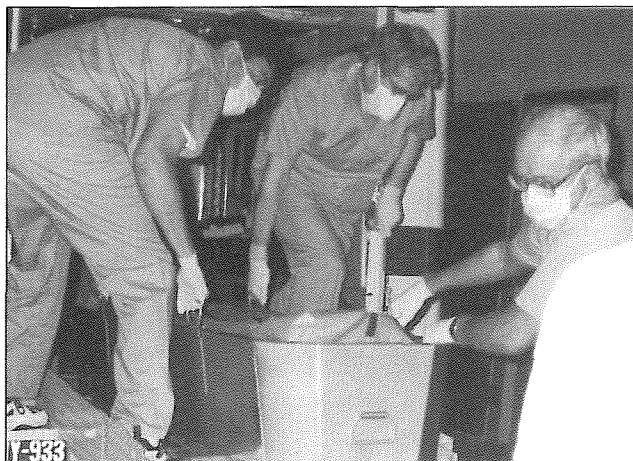
tuary, leaving Hugh to supervise the administration of our transport protocol (once the doctor's orders for post-mortem treatment were carried out) and the patient's release. I arrived at the mortuary quickly and found the transport vehicle already on its way. The embalmer had been notified and would arrive soon.

Starting ten minutes after pronouncement, the transport medications were administered to the patient, and he was packed in ice. Manual chest compressions continued until 2:15am (MST).

By the time the patient arrived (2:27), everything was nearly ready. Hugh entered and immediately began cleaning the pump and preparing the tubing array for the blood washout. During this, the embalmer arrived. Once he was briefed on our surgical and washout procedures, he and Hugh began the femoral cutdown. At that point, I went to secure the transit paperwork and to expedite our impending departure. The femoral cutdown was started at 3:08, and the flush was started three minutes later. Hugh observed immediate venous return with no signs of clotting.

The blood washout was complete by 3:25, and by the end, the color of the venous effluent had lighted considerably and indicated good hemodilution. The patient was then packed in ice and a watertight shipping container for transport to Arizona.

We were still working to secure a flight. Unfortunately, no airline cargo offices opened until 6:00am. With some effort, we were able to make arrangements for the patient to go out just after eight. The Alaska Airline Service Department sent special instructions to the Cargo Department informing them of our situation. They streamlined their cargo procedures and waived the pre-



With cryoprotective perfusion complete, Mathew Sullivan (left), Steve Bridge (center), and Hugh Hixon return the patient to Alcor for cooling.

flight holding requirements. This was good, because I was booked on a flight to Phoenix leaving at six. Hugh was to accompany the patient on a flight leaving at eight.

Upon my arrival at the Alcor facility, I found many of our suspension team volunteers already there. Rhonda lacuzzo was preparing the operating room for surgery; Ralph Whelan had strung the pump and was already filtering the first portion of the perfusate. Russell Cheney flew in from Los Angeles to assist, and he looked like he needed something to do, so I asked him to take notes and to photograph the procedure.

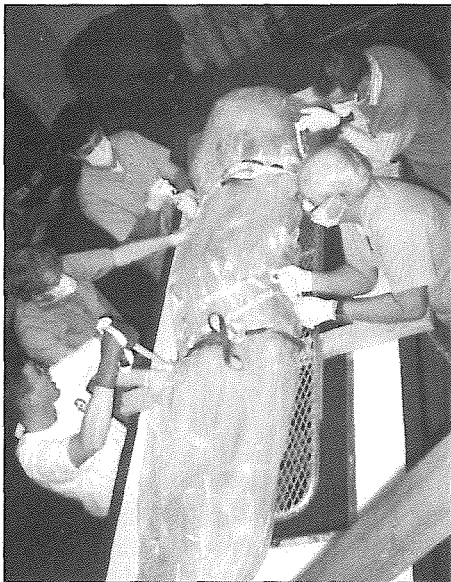
Dr. Nancy McEachern had just arrived and was looking over the patient's medical records when the ambulance pulled in. The patient arrived in the early afternoon (12:05), and shortly thereafter, Dr. McEachern raised some new concerns about the infectious status of the patient which caused us to delay the unpacking and surgery.

In addition to being a carrier of AIDS and hepatitis, our patient had a history of CMV retinitis and disseminated MAC. In Dr. McEachern's experience, mycobacterium avium is a disease carried by birds and which is so dangerous to humans that when she treats an animal which is even suspected of being a carrier, she must report the animal to the Centers for Disease Con-

Our Thanks to the Participants. . .

Steve Bridge
Tony Cerullo
Russell Cheney
Dave Cosenza
Hugh Hixon
Rhonda lacuzzo
Tanya Jones
Keith Lofstrom
Nancy McEachern
Carlos Mondragon
Matt Milkovich
Judy Muhlestein
Mike Perry
Derek Ryan
Brian Shock
Jay Skeer
Mathew Sullivan
Ralph Whelan

Our thanks go out as well to the volunteers who wish to remain anonymous, and to the hospital and funeral service personnel for their professionalism and courtesy.



Preparing the patient for submersion in silicone oil for cooling to -79°C .

trol (CDC) in Atlanta. Special care must be taken during treatment, including the use of a ventilation system to remove the airborne bacteria from the surrounding air. Dr. McEachern was concerned that our patient carried the same virus and that the entire staff would be at risk once the chest was opened during surgery unless the facility had adequate ventilation. Others argued that the human version of the disease was much less infectious and that no special precautions needed to be taken.

With two completely opposing viewpoints being expressed rather adamantly, we decided to get more answers before removing the patient from the insulated shipping container for surgery.

We placed a call to the CDC, but it would be some time before they got back to us. Meanwhile, we attempted to contact other infectious disease specialists. After a couple of hours, we found that most of the consultants agreed that the risk of contracting MAC was low when personnel wore the proper protective clothing, but we could not eliminate the possibility.

We knew the Alcor ventilation system would be inadequate to contain an infectious airborne virus, as one conditioning unit cooled both the operating room and offices in the front of the building.

Funeral Director Tony Cerullo volunteered that his mortuary had better ventilation and offered to assist. At this point, we decided to reduce the team to the fewest number of people possible to perform the cryoprotective perfusion and to do the surgery at the mortuary. And with an indeterminate chance that opening the chest would expose unseen dangers, we decided to attempt the cryoprotective perfusion through the carotid artery and jugular veins. We would still drill burrholes to allow us to view the brain directly.

Only Tony Cerullo, Dr. McEachern, Steve Bridge, Rhonda Iacuzzo, Hugh Hixon, Mike Perry, and I were to go. Matt Milkovich also volunteered, and he proved a keen eye for guarding against accidental exposure by team members. Everyone else helped us prepare and pack.

The setup and surgery went as smoothly as it could, considering we had transported much of our operating equipment. Perfusion was started at 19:00 and went for more than an hour. By the end, the patient's venous glycerol concentration was 6.69 Molar, and the burrhole glycerol concentration was 6.89 Molar. The patient was also showing the physical signs of rapid glycerol perfusion—severe dehydration and an dull orange skin hue.

Once perfusion was stopped for low flow and high pressure readings, the patient was returned to Alcor for cooling. The stages of cooling to -79°C and to -196°C went smoothly. Transferring the patient to the storage dewar also went well.

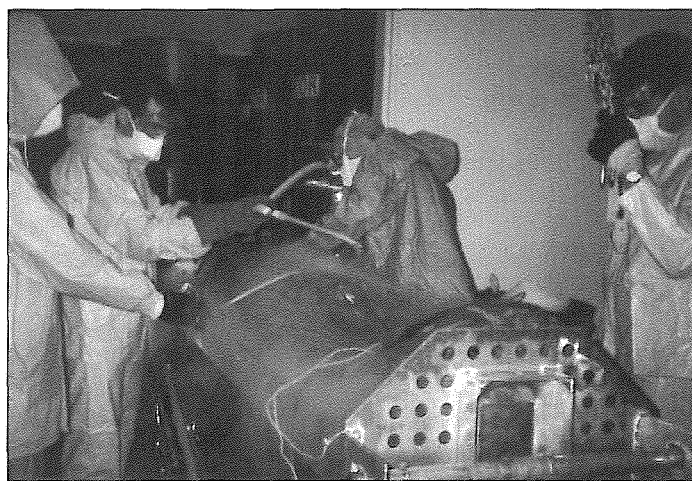
Within 24 hours of pronouncement, Patient A-1600 had been transported from Oregon to Arizona, been cryoprotectively perfused, and had

begun the long descent to liquid nitrogen temperatures. We had some problems, and there are a few things which may take time to resolve.

Some things have already been fixed. We have a new type of portable ice bath which is sufficiently small that it can be hand-carried on an airplane. Our remote kit has been reorganized so that no piece of equipment can be neglected. Better organization and documentation will follow in other areas as well.

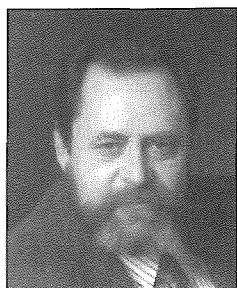
The infectious concerns raised in this case have caused us to install a dedicated air-conditioning system for the operating room. The surgical field will soon be connected to a negative pressure system circulating through air filters and ultraviolet lights. This system will neutralize a broad range of common and uncommon bacteria.

The patient known as "A-1600" was a private man, but the impact of his cryonic suspension was dramatic. It will lead to better cryonic suspensions and to better protection for our valuable staff. I regret his passing, and hope that I may yet someday thank him for the lessons I've better learned for this experience.



The patient is transferred to a pod for cooling to -196°C and subsequent long-term care.

Alcor Makes Plans to



At times, many of you probably ask yourselves the very same question I often ask myself: "How can I improve my chances of not having to be dead forever?"

My answer is always the same: "The more I help Alcor today, the better prepared Alcor will be to help me when the time comes."

In May of this year, the Alcor Board decided to create a Department of Development with myself, David Pizer, as the Director. I have always been interested in finding ways of raising money to help in cryonics. Now I will be able to afford to spend more time raising that money, and thus helping Alcor be better prepared to help me (and you) when the time comes.

Although I feel that Alcor is the leader in cryonics, there are many areas in cryonics that need improvement. My feeling is that our members have important suggestions in which areas we should use our resources first. Recently I sent a letter to each member and some of our other supporters asking for ideas. There was a much larger response than I had anticipated, and I have passed those suggestions on to other Alcor personnel. I want to thank everyone who took the time to respond. Over the next few months I will be calling every Alcor member to discuss these issues.

For those of you who did not re-

spond to my letter (and even those of you who did), I would like to invite you one more time to respond. As you have probably noticed, included with this issue of *Cryonics* is a flyer detailing some of the important projects we have outlined for ourselves to improve Alcor and the technology of cryonic suspension. The more feedback we have from you as to which of these things you view as most important to our progress, the better able we will be to build the kind of organization we all want.

We are committed to raising the money required to accomplish these goals. First, we will take our case to our membership and give them the opportunity to help. Then I would like to see if we can go outside the cryonics community and take our message to the general public. The feeling among some of us is that there are people out there who would like to see cryonics technology developed further, but may not want to sign up for suspension yet or at all.

For instance, some older people may not want more than the standard lifespan for themselves, but might see it as "good" if children who suffered from terminal diseases could have better access to a more developed cryonics so that they could wait it out in biostasis until the cure for their terminal disease is developed. A grandparent of a grandchild with a terminal disease would be a prime example.

In fact, the major charitable research organizations in the world receive most of their funding from people who generally want to do "good" in the world, rather than spend their money

on something so "selfish" as saving themselves. Most people who give to the American Cancer Society, for example, are not afflicted with cancer, but would like to see it cured. For all those philanthropists who would like to see mankind finally conquer diseases whose cures seem to be right around the corner, the perfection of cryonics technology would be the perfect vehicle for getting the sick the time they need to wait it out.

Bear in mind that this is a long-term program; it will not happen overnight. But by building on our past success and our current determination, we can all work together to bring major positive changes at Alcor. What we want and need right now is your input and your financial support.

Our membership has always been our strongest resource. Alcor and each member have formed a partnership for mutual survival. If you think that some of our suggestions are projects you would like to see us pursue, I invite you to send a donation to underwrite the costs involved. If you can underwrite the full cost of one or more specific projects, that would be great. If you want to make a donation to underwrite part of the cost, that will also be helpful. In some cases, members may just want to make a general purpose donation, which is also very valuable to Alcor.

There are many ways you can send your donation: send us a check; send us your credit card number and authorization; or send us authorization to bill you (or charge your credit card) on a regular basis.

Move Ahead *Faster*

As I mentioned, Alcor is the leader in cryonics, but there is a lot of work that could be done to increase the odds of revival for all of our patients, current and future. The better we can suspend you now, the more likely it is that we can revive you in the future.

Let's pull together and save our lives!

Daniel Pizer

Some additional thoughts from Alcor Accounting Manager Joe Hovey. . . .

As Dave Pizer mentions, Alcor's board of directors has named him our full time fund raiser. This announcement marks an important development in Alcor's strategic thinking.

Though Alcor has survived many crises and emerged stronger than ever, we still can fairly be described as a 24-year-old start-up company. This is because of our heavy reliance on volunteers (whether paid or not) to staff the organization, and our still small membership base (currently 389).

For most of its history, Alcor has primarily been concerned with simple survival. We have concentrated on establishing ourselves as a viable institution that is accepted by the business and medical community, while at the same time guaranteeing to our membership the best possible overall suspension and storage capability in the field.

With our move to Arizona two years ago and the advantages that have ac-

crued from that, I think it is safe to say that this phase in Alcor's development is largely over. The establishment of a sound financial base for our regular operations, the connections we have made in the local medical community, and the imminent establishment of Alcor's Patient Care Trust all indicate that organizational survival is no longer the main question. Now it is time to move ahead.

We have an ambitious agenda for the next several years, as can be seen from the list of objectives detailed in Dave's article and the flyer accompanying this issue. This is going to require a lot of work and dedication on the part of all of us. It is also going to require something else, without which none of those objectives will be achieved: *Money!* It is clear that we can achieve all of the objectives listed if we have sufficient resources. But the resources are going to have to be substantial. We're talking here about seven and eight figure numbers. If Alcor is going to develop to its fullest potential we are going to have to start thinking in much bigger terms than we have been used to.

The person chosen to head this effort is Dave Pizer. Dave has been an Alcor member for eleven years. He has been an Alcor director since 1989. He was instrumental in helping to save Alcor during its gravest crisis to date, the Dora Kent affair in 1987. Along with others, Dave put his personal fortune on the line and was a key person in one of the lawsuits that Alcor filed that ultimately got the Riverside, California authori-

ties to back off. He has donated over \$100,000 of his own money to Alcor over the years as well as helped Alcor raise more from other sources. He was the driving force behind the search for a new facility for Alcor in Arizona and found the one we are now in. He did a lot of the leg work involved in negotiating the very favorable terms we ultimately received for the purchase. It was through his efforts that many of the scientific as well as business contacts were made on Alcor's behalf in Arizona. Dave has also served as Alcor's *volunteer* administrative vice president for the last eighteen months and has taken a great deal of the load off of president Steve Bridge.

Most importantly, Dave brings to Alcor a lifetime of business experience and instinctive knowledge of what to do and what not to do when asking for other people's money. In addition to his boundless energy and enthusiasm, he has developed many contacts in Arizona which will be of great benefit in his new fund raising capacity.

What we are asking him to do now is in many ways the toughest job Alcor has ever requested of him. It is also one of the most vital. If he can raise the funds necessary to move Alcor along to the next stage of its development, we will all owe him a tremendous debt of gratitude. With the resources we are asking him to provide, Alcor will truly be able to advance into the next century with continued optimism and confidence.



Information Storage and Computational Aspects of Repair

By Tad Hogg, Ph.D.

Cryonic suspension is an attempt to preserve enough of a person's body, after death by current standards, to allow future technology to restore the person to health. This preserved physical structure may not in itself be sufficient for future repair, due to the damage caused by suspension, especially if the suspension is delayed. So people planning for suspension might improve their chances of eventual revival by saving additional information

about themselves in the form of records separate from their bodies [1-3]. But, what should be saved, and how? Before discussing these questions in sections 2 and 3 below, it first helps to better understand why saved information could be useful.

Why Save Information?

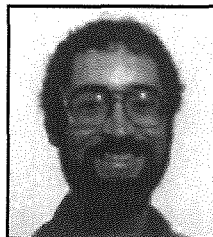
Three distinct technical abilities

are required for repair [4]: 1) observe, in sufficient detail, the preserved structure, 2) compute what changes need to be made, and 3) manipulate the structure to make these changes. The scale of these operations (e.g., molecular or cellular) will depend on the amount of suspension damage.

Technologies required for these steps could develop at different

times. In cases where the second step is the bottleneck, additional information could shorten the time until repair becomes feasible. This is because the second step is primarily one of information processing: determining the original (healthy) physical structure from the (damaged) preserved structure and whatever other records about the person are available. Such records consist of descriptions of the person and the suspension method.

There are two important aspects of using information for repair. The first is whether the information uniquely determines the original structure, up to changes that don't matter for preserving identity. The



Tad Hogg is a researcher at Xerox PARC. His work includes devising market mechanisms to coordinate large distributed computer systems and examining the connections between physics and computation.

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second is the computational problem of actually finding such a structure, and planning a series of physical changes to construct it. Even when there is a unique structure, the time needed to find it by searching through the enormous set of possible structures can mean, in practice, the original structure cannot be found. This remains true even with much more powerful computers [5], with the possible exception of (so far, hypothetical) quantum computers [6,7].

To reduce the required computation time, sophisticated heuristics can guide the choices made during the search. These procedures consider only a few changes at a time and estimate whether each of these changes gets closer to solving the problem. At each step a change that seems to get closer to a solution is selected [8]. This method sometimes gets stuck where none of the changes can improve the situation. In these cases one must make a few changes that temporarily make things worse [9]. Even though these heuristic methods are not guaranteed to find a solution quickly, they often work quite well, and are much faster than examining

all possibilities [10,11]. Heuristics are especially effective when they use plenty of information about the solution. Thus even when there is enough information to determine structure uniquely, additional information could be very important for reducing the computational search.

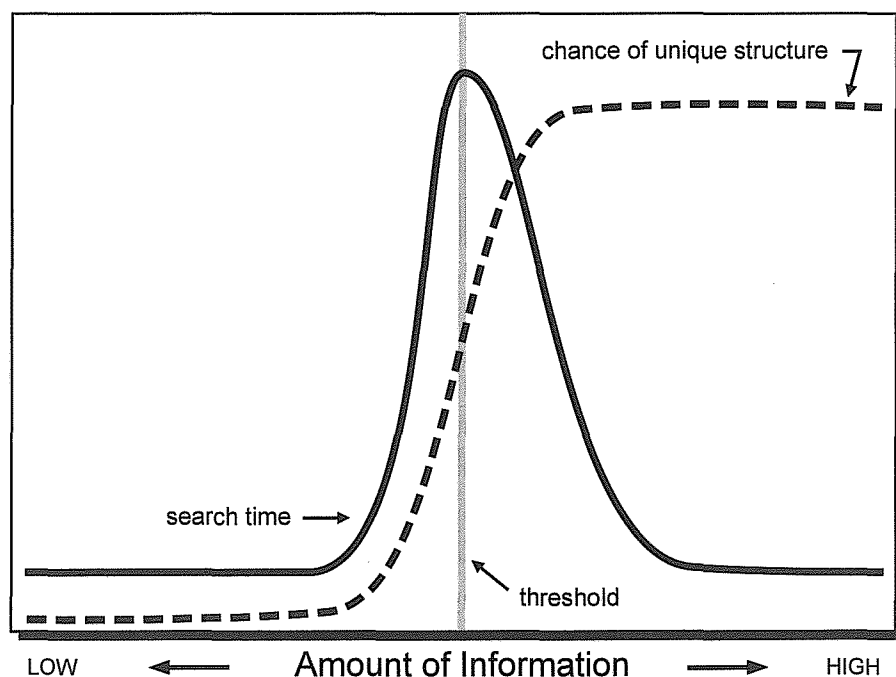
This is particularly significant because there are abrupt transitions in the quality, solvability and required search time in large computational problems as information is added [10,12,13]. This contrasts with the gradual improvement one might expect from experience with small problems. That is, there is some essential amount of information beyond which the problem most likely has a unique solution, and below which the problem has extremely many. In this latter case, the chance of finding the correct reconstruction would be very small. Moreover, problems near the transition tend to be the hardest to solve: these would be the cases for which even the best future technology would have the most difficulty. For the computational problems associated with tissue repair we don't know where this

information threshold is. But its existence means a little extra information, especially giving a wide variety of constraints, can help a lot in some otherwise marginal cases.

External records can also help evaluate the quality of a repair. In fact, this might be the only way to determine when the repair is complete, instead of "just" producing a similar, healthy individual. Even if it doesn't help a particular case, this evaluation could help improve future repairs by showing what information is sufficient for repair with a given level of technology.

Other reasons to maintain records include the information's value to you [2] and providing your preferences for various repair options that may be, from a purely technical point of view, equally likely to work [14,15].

To help make these ideas more concrete, the use of information in a simple repair problem is illustrated in BOX 1. While this artificial example shows the essential computational issues, repairing damaged tissue will be much more complicated. For instance, the constraints provided



This graph plots how information affects the chance of having a unique structure (dashed curve) and search time (solid curve) for large problems.

With too little information, there are many consistent structures and one of them (most likely not the original) is easy to find. With a lot of information, there is a unique consistent structure, and it is easy to find. Between these extremes is a threshold (vertical gray line) where the chance of a solution changes rapidly and problems are hard to solve.

by the information won't always be so clear-cut. Instead they'll assign probabilities to distinguish likely from unlikely original structures [12]. Also, errors in the records or their interpretation could give conflicting constraints. Learning how to interpret the information properly

will be one of the major tasks to complete before repair can proceed. Because we lack this knowledge at present, we can't know for sure whether the computation is feasible [5]. Instead we're forced to rely on more general feasibility arguments [10,11,12], realizing that these are

suggestive, not definitive.

What Should Be Recorded?

Current knowledge of the physical basis of identity and memories, and how much change is tolerable, is rather limited. So it's impossible to say what records will definitely be useful; however, there are some reasonable suggestions. To help elimi-

Box 1: A Parable of Coins

To illustrate how information can help, let's consider a very simple repair problem. Suppose instead of repairing a suspended person you are "repairing" a "preserved" sequence of ten coins. You want to reproduce the original sequence of heads and tails. For the sake of illustration, we'll suppose some additional records are available. Although the details are artificial, these records show how different types of information can be combined to improve the reconstruction.

When the sequence was preserved it was inside a box preventing examination of individual coins, though some properties could be determined with the crude technologies then available. Now you can directly observe the "damaged" sequence and turn over individual coins, corresponding to the first and third steps in the repair process. Suppose you observe



with the leftmost and rightmost coins denoting heads and tails, respectively. You now need to deal with step two, i.e., figure out which of the 1024 possible sequences was the original one.

If all you know is each coin was tossed during preservation, you couldn't determine the original sequence: all possibilities would be equally likely. Fortunately you have some description of the preservation process and the original sequence. It turns out there were two preservation methods used for these boxes of coins: shake the box vigorously ("cremation") or bump it gently ("suspension"). The records tell you this particular box is a result of the gentle method. They also note that the original sequence had a property called "balanced," determined by an old, crude measurement process which you find described in a library. To use this information, you must relate it to the condition of individual coins, a level of detail that wasn't

available when the sequence was preserved. You do this through a series of experiments.

First, you reproduce, as closely as possible from the available descriptions, the preservation methods used and examine the damage caused. You find that vigorous shaking results in a random flip of each coin. The gentle method always turns over exactly five coins, leaving the other five unchanged, but which five are changed varies randomly from one experiment to the next. This already greatly reduces the repair problem: you now only need to figure out which five coins were turned over, of which there are 252 possibilities.

Furthermore, examining other undamaged coin boxes shows original sequences always have the same face showing for each neighboring pair. That is, the first and second coin must both be heads or both tails, and similarly for the 3rd and 4th, etc. This constraint leaves 16 possibilities.

Finally, you study other cases that are balanced, a property observed to apply originally to the sequence you are repairing. You find this means the number of heads in the first half of the sequence is the same as in the second half. This leaves only 6 possibilities.

This is all the information you have, so each of these remaining possibilities is equally consistent with everything you know. It now remains to actually find one of the consistent possibilities. Conceptually, the simplest approach is to go through all 1024 possible sequences until you find one that satisfies all the constraints. However, this method isn't feasible for long sequences because the number of possibilities grows extremely rapidly. For instance, with just a thousand coins there are so many possibilities that, even if every atom in the observable universe were a separate computer checking a trillion possibilities per second since the Big Bang, almost all the choices would still not yet have been examined. Instead you use a heuristic search method, turning over a single coin at each step, com-

nate incorrect reconstructions and cross the solvability threshold, it's best to save a variety of characteristics that distinguish you from others, especially information that cannot otherwise be inferred in the future. Variety provides many different constraints for the repair process which in turn can lead to effective search heuristics.

Information of a more general na-

ture should also be useful. This includes the microscopic nature of memory storage, requirements for healthy cells, structural changes that preserve identity, and the effectiveness of different repair options. We currently lack the means to determine this information. Fortunately this sort of information applies to all people, so it can wait to be provided by future technology. This is also true for

determining how records relate to physical properties of tissue structure. Thus, information that currently appears to have no value, because we don't know how it relates to physical structure, could be useful in the future.

Types of Information

There are two types of individually distinguishing information. The

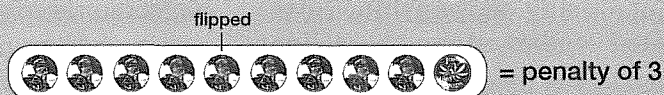
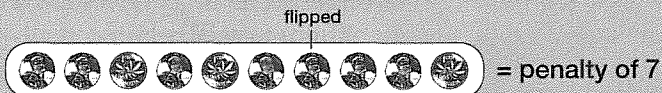
bined with a test for getting closer to a solution expressed as a penalty for violating each constraint.

The first constraint requires five coins in the damaged sequence to be turned over. So as a penalty you compare how many are actually turned over to this required value. For the second constraint, you count a penalty for each neighboring pair showing opposite faces. Finally, for the third constraint, you count a penalty for the discrepancy in number of heads in the first and second halves of the sequence. Smaller penalties mean the constraints are closer to being satisfied. A sequence consistent with all the constraints has zero total penalty.

In the damaged sequence,



no coins have yet been turned over, giving a penalty of 5 for the first constraint. For the second constraint, among neighboring pairs, the 3rd and 4th coins, the 7th and 8th and the 9th and 10th have opposite faces, giving a combined penalty of 3. This sequence has three heads in the first half and two in the second, for a discrepancy penalty of 1. So the total penalty is $5+3+1$ or 9. With this measure, you flip coins so as to reduce the penalty. For example, flipping coins 6, 7, 3, 5 and 10, in that order, results in decreasing penalties of 8, 7, 4, 3 and 0 respectively:



The final result,



is one of the six sequences that satisfy all the constraints.

How well have you done? In this example, the odds are 1 in 6 that you reproduced the original sequence exactly, much better than the odds of 1 in 1024 you started with but still not perfect. You may actually have done even better if, among the five incorrect reconstructions, there are a few with the "same identity" as the original.

As an analogy with repairing suspended people, the three constraints for the coins correspond to different sorts of information. The first constraint involves damage caused by suspension. The second constraint is a property of all undamaged sequences, analogous to information about healthy tissue structure in general. Finally, the third constraint is specific to this individual case, analogous to a description of a person's preference or memory. The repair calculation required both the saved records and new experiments to interpret those records. This illustrates how the usefulness of information is a combination of the quality of the records themselves and the capability of future technology.



first describes physical structure and the second is mental or cognitive. These impose different requirements on future technology for their use and also differ considerably in the ease with which they can be obtained now.

If damage is relatively minor, it may be sufficient to restore the tissue to biological viability. This would require detailed knowledge of the nature of healthy tissue and the types of physical damage that occur during suspension. Some limited studies along these lines already exist [16,17], though much remains to be done. Records of the suspension, such as measurements of temperature and chemical concentrations vs. time, can help with this type of repair, and also indicate the quality of the suspension [18].

Medical diagnostics, such as MRI scans, give physical measures of the original healthy tissue structure. Currently this sort of information is expensive to obtain and probably lacks enough resolution to help discriminate among different individuals at the scale where repair needs to take place. Nevertheless, as these technologies improve they could provide useful information. In fact, even if current measurements appear to have insufficient detail, future improvements in their interpretation could make them useful for repair. Taking this to an extreme, some of this physical information could also be obtained during repair through a series of simulations [12].

For more extensive damage, the repair process may need to use records of mental characteristics. This information is much easier to obtain at present than the physical information described above. However, using such characteristics for repair will be more difficult because it requires learning how these

properties relate to the underlying physical structures that encode them.

Suggestions for Individual Records

A variety of easily recorded information is given in the following list. Being specific, and elaborating the reasons for responses, will best help distinguish yourself from other, similar people.

1. Memories

- memories of people and events, e.g., a diary
- memories elicited by photos, music, stories, odors, etc.
- events that happened to you but you don't remember, e.g., some of your childhood events as described by older relatives; these may nevertheless have made physical changes so the memories are there but just not accessible
- knowledge and skills you have, e.g., languages

Even trivial sorts of memories you don't really care whether you keep could be useful. What habits do you have? What is your typical day like?

2. Personality

- preferences: what you like or dislike, e.g., about people, books, art, music, movies, places, rituals, and foods
- your interests and hobbies
- psychological tests such as those used to help identify career interests and personality preferences [19]; more important than the answers themselves are the reasons for your answers, i.e., use the test questions as prompts to describe yourself
- jokes you find funny or not
- views on current events and policy choices
- personal philosophy on ethics,

the relation of individuals and society, etc.

3. Individual psychophysical behavior

Most psychophysical experiments require laboratories to conduct. But there are some easily available records, such as voice and handwriting samples, and reactions to illusions known to differ among people [20].

4. Writings, publications, artistic and music compositions, presentations, etc.

These can be memory aids, especially in conjunction with descriptions of the background behind each item. With sufficient quantity, their statistical properties, e.g., of word choices, can help distinguish you from others as in studies of disputed authorship [21], and the relationship of word choices to brain structure [22].

5. People who know you

Other people who know you well could give additional information. If they are much younger than you, they may also be available during repair to provide information, such as suggestions of which available repair options you would want. Alternatively, if they are also suspended, the constraints provided by knowledge you have of each other could allow the repair computations for the whole group to proceed even if they would not for each individual considered separately.

6. Preferences for reanimation

As repair technology develops, a variety of options will become available. For instance, whether to attempt a reasonable repair as soon as possible or wait for further improvements to give an even better reconstruction. Repairs could also introduce physical or mental changes. To

help select among these options, a record of your preferences, and your reasons for them, would help [14,15].

What physical changes might you like as part of the repair process? For instance, if you currently wear glasses, would you like the shape of your eyes corrected? Or to provide more familiar context for adjusting to future society, would you prefer minimal changes? At the other extreme, would you want to start with whatever is currently fashionable at the time of repair, even if very different from what you're used to now?

Repairs capable of using records of your memories or personality could also make changes in them. What are your thoughts on this? Suppose some memories can't be restored completely. Would you prefer to have the lost memories "filled in" with a "best guess," to be repaired without them and make a choice after reanimation, or wait in suspension a bit longer in the hope that better technology or the interpretation of additional records will allow complete repair?

What if there are conflicting records from different times in your life [1,3]? For instance, suppose you enjoy bird watching at age 20, and leave extensive records on this hobby, but lose interest later in life. Should these records be used for repair even though they are obsolete, and could result in a mixture of memories and preferences from different times in your life?

As another example, languages are continually changing: the common idioms, word choices and accents in the future could be quite different than those of today. Would you prefer to have new language skills added during reanimation, if possible, or gradually learn them afterwards?

More generally, what to you constitutes an adequate repair? What physical or mental changes would

you be willing to tolerate if they meant an earlier reanimation? If other people you know are also suspended, would you prefer to wait until some of them can also be repaired?

At present, the eventual options are unclear, making it difficult to answer these questions. So you may find it makes sense to rely on the best judgements of people in the future, based on their experience with other repairs. In that case you might record the trade-offs as you see them now as a guide to choices you might have made. At some point, the options may become more clear and you could then state more specific preferences. Of course, because of the uncertainties of future technology, these preferences should be viewed as guidelines rather than strict requirements.

How Should Information be Stored?

Information storage requires selecting a durable storage medium for

the records and placing them in a stable long-term environment. Archival storage environments are provided by various companies, and arrangements for their use can be made through cryonics organizations [2,23]. For the storage medium there are various choices, with different trade-offs among known physical durability, cost, storage capacity and type of information they can readily contain [24,25].

Paper has remained legible for centuries if carefully stored and is particularly good for recording text. But paper is bulky and less suitable for images and sounds. Microfilm offers a compact alternative archival storage medium, currently in widespread use.

Another option is digital storage. This has the advantage of compact storage for a wide variety of information, including text, photos, video and sounds. For instance, a large amount of information can be stored on CD-ROM, equivalent to the text in hundreds of books. Individual re-

Box 2: A New Option for Digital Storage

Record storage is a natural complement to maintaining people in suspension. A simple option for digital records is currently being planned as part of a larger effort to expand the Alcor pages on the World Wide Web (<http://www.alcor.org>) by Ralph Whelan, Steve van Sickle, and others.

This will include public information about people in suspension. It will also accept, via electronic mail, comments from their friends for archival storage. Some of these additional records may be useful for repair. This system will also allow members to save digital records for themselves prior to suspension.

Some practical issues need to be resolved for this service. These include privacy of the records, the size of the files (text shouldn't be a problem, but images, video and sound files can use up storage space very rapidly), changes or corrections (e.g., new reanimation preferences) and an institutional structure to ensure the digital records are replicated and copied to better media as they become available. Nevertheless, this proposal to use the Web and electronic mail for creating digital records is an important new storage option. Its simplicity of use should also help overcome people's procrastination since individual records can be constructed a little at a time.

corders are available for around \$1000, and \$10 per disk [26,27], although for making just a few CD-ROM's a cheaper way is to use companies that create CD-ROM's from data you provide. As with other technologies the cost should drop substantially in the next few years.

Can digital media preserve information reliably for long periods of time? Just as with paper, the media eventually degrade due to, for example, heat or moisture. Unfortunately, in spite of some experiments, the long term reliability of CD-ROM's has not been tested fully [28]. Still, many types of information, such as English text, have a great deal of redundancy so losing a few bits is unlikely to make it completely unreadable. And any future technology capable of detailed examination of preserved tissues will also have much greater capability for recovering damaged information from digital media than is currently available.

With digital storage you might also worry that file formats rapidly become obsolete [24]. This is unlikely to prevent using the information for repair because reference libraries should maintain descriptions of the common formats in use today, to aid future historical research. Furthermore, even if the exact format descriptions are unavailable, redundancy in stored information makes interpreting digital data a much simpler task than computations to repair tissue in microscopic detail. Nevertheless there are some easy ways to minimize this difficulty. These include using simple widespread formats such as plain ASCII, using several different formats and some easily described files to provide a check on the correct format. You should also record, on paper, a summary of the contents, as well as describe the file format and programs used.

Digital information can also be readily copied from one physical medium to another as technology improves, providing easy migration during your lifetime. After suspension this copying process would need ongoing institutional support. One such proposal is described in BOX 2.

In addition to individual storage, you can also use existing archival services provided by libraries for newspapers, books and other public materials maintained for historical or reference purposes. If you are a writer, your publications in these sources are likely to be maintained as part of a larger archival effort. You could then save, on paper, a list of your publications. Currently library archives are mostly paper and microfilm, but a large effort is underway to find suitable archival storage methods for digital data [29], including World Wide Web documents. The results of this effort should, in a few years, also provide another format suitable for individual use.

While there are many options, a reasonable choice is to use paper or microfilm for the most important textual records, collect the larger records digitally during your lifetime while you can continually upgrade to better archival media, and then transfer the information to a stable environment, within the limits of reasonable expense.

Finally, remember one of the real benefits of external records: redundancy. Make copies, perhaps in multiple formats, to save.

Summary and Afterthoughts

A key step in repairing suspension damage is determining the physical changes required to restore healthy function. With current suspension methods, it's likely this will

involve substantial information processing. While a great deal of information exists within the preserved tissue, additional records could simplify the computation required for repair. Many types of individually distinguishing information can be obtained easily and saved for this purpose.

Technologies able to interpret and use these records, especially descriptions of memories and personality, raise many intriguing questions beyond the repair process itself [1,14]. As an extreme example, this may allow people to readily change many aspects of themselves, mental as well as physical, that we currently regard as fixed and part of what defines a person. This could include changes in personality, preferences and memories. In such a world, the concept of what constitutes a person and the range of changes that can be made without losing one's identity will be very different from what they are today. This raises an ironic possibility: from that future perspective a precise match to the original person may appear less important than it does to us now. Such an expanded view of personal identity could allow some repairs to be judged adequate in preserving identity even if they would not be so regarded from our present perspective. This in turn could encourage people to proceed with repairs for cases that were previously thought to have too little information for adequate reconstruction, even without any additional improvements in technology or available information.

This discussion highlights a key purpose of suspension: preserving individual information. From this point of view, the required information can be shared between preserved structure and external records, so that records can compensate for some

suspension damage. This also raises the question of how much information is required to determine a unique individual, and whether it could exist entirely in external records [30]. This emphasizes the philosophical view that, fundamentally, our iden-

tities are not tied directly to our functioning bodies, nor even to the preserved physical structure of these bodies, but rather to whatever information is required for accurate reconstruction [31]. Whether this in fact is the case is a difficult philosophi-

cal question. Seeing how additional information helps with repair could provide a strong empirical grounding for addressing this question.



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Timothy Leary — “Why Not?”

By Stephen Bridge

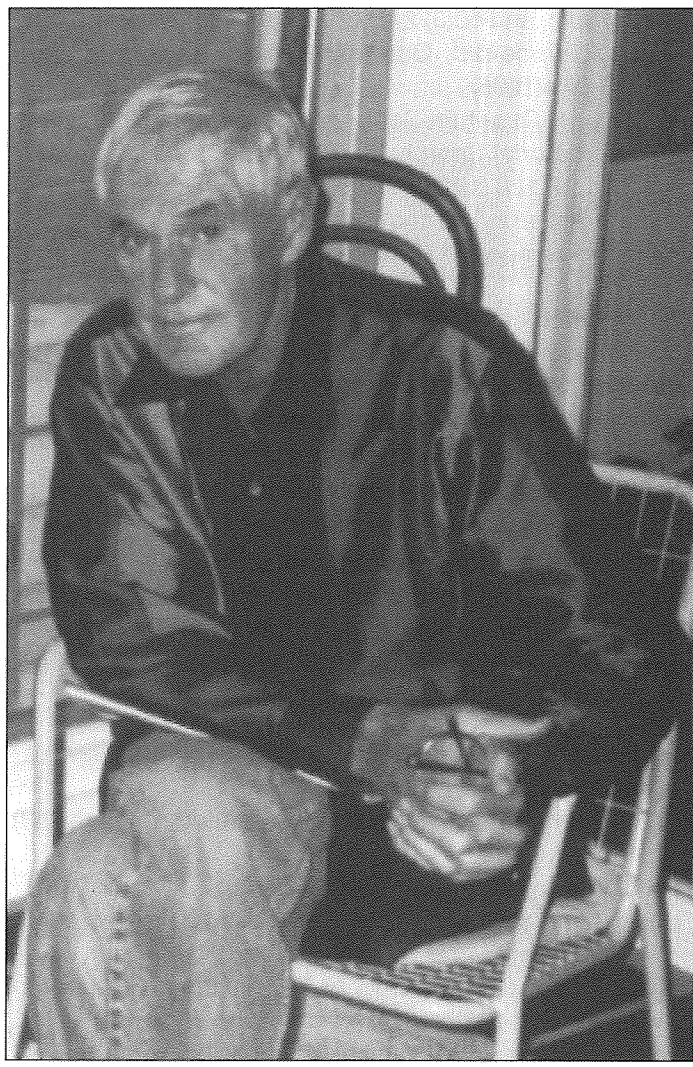
By now you've probably heard the news reports: Timothy Leary died in Beverly Hills on May 31, 1996. Many of you may have been surprised by what you did *not* hear:

a report of his cryonic suspension. After all, Dr. Leary had been an advocate of cryonics since at least 1986 and a public suspension member of Alcor since 1988. What happened?

We don't know the whole story, and no one will ever completely know it, because we won't be able to ask Tim Leary himself how he made his decisions. Whatever the reasons, the result is the same. **Timothy Leary chose not to be frozen.** The closest he will come to immortality is through his writings and through his cremated ashes possibly being flown into space someday with those of Gene Roddenberry. From my point of view, that's not very darn close.

Timothy Leary was one of the most colorful and interesting people of the 20th century. He was a psychologist, a philosopher of self-dependence and free choice in all things, a constant tweaker of the long nose of government, a software designer, and a public speaker. He will always be known as the essential spirit of the 1960's, with his advocacy of hallucinogenic drugs, especially LSD, and his opposition to the Viet Nam War.

In the 1980's he became interested in cryonics, especially through his friendship with Alcor Director Keith Henson and Keith's wife, Arel Lucas, who had worked for Leary for several years. Leary was the featured speaker at the 1987 official dedication of Alcor's building in Riverside,



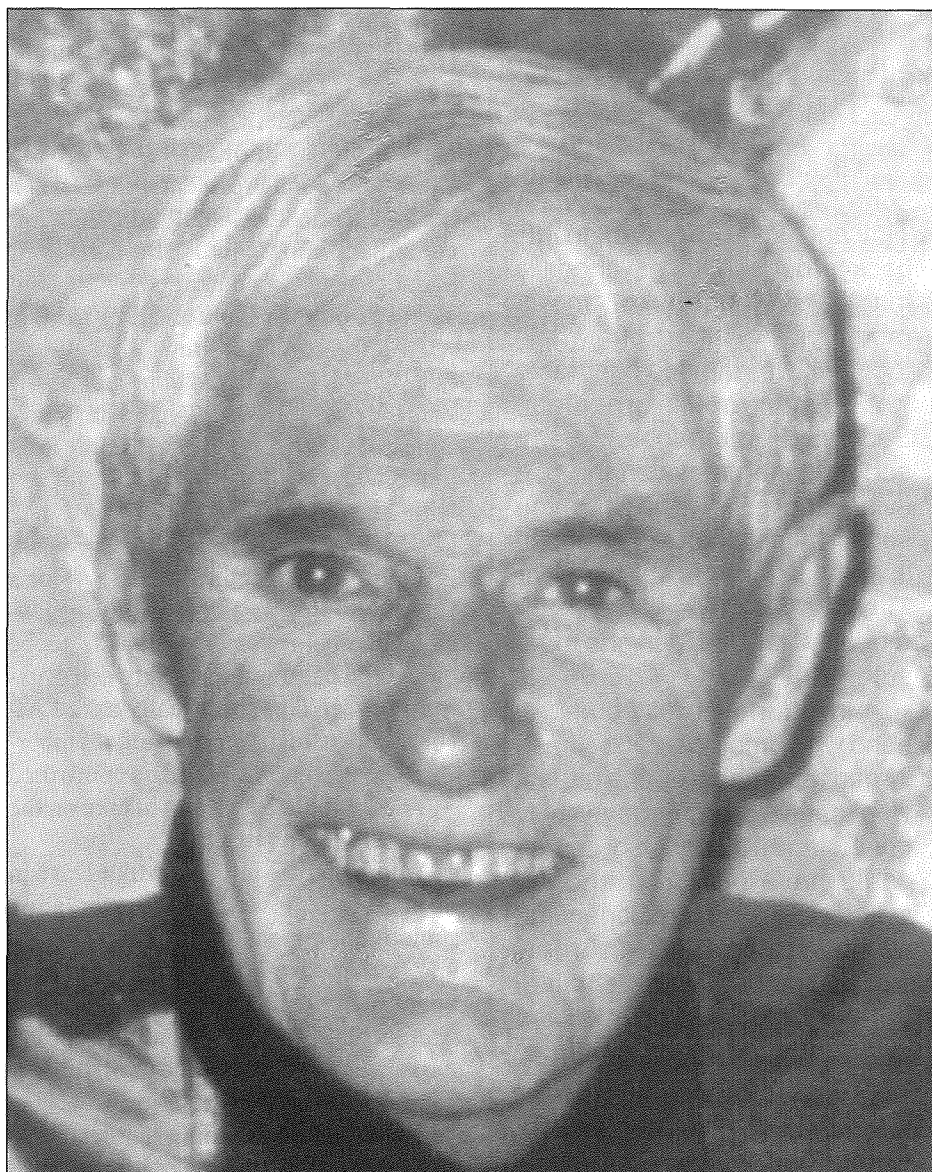
Tim at the 1993 Alcor Turkey Roast

California and became an Alcor member in 1988. Over the years he hosted several Alcor parties at his home, including three December "Turkey Roasts." He graciously consented to interviews about cryonics on several occasions and mentioned cryonics often in his speaking engagements as a "stand-up philosopher."

In 1994, Tim Leary was diagnosed with inoperable prostate cancer, although the prognosis was that he had several years of life left with competent medical attention. We gave Tim some recommendations for questions to ask and alternate physicians to consult, but he didn't seem very interested; so I assumed he was satisfied with the medical care he was receiving. At the December 1994 Turkey Roast at his home, he appeared thin but still enthusiastic about life and cryonics.

In the summer of 1995, Tim Leary switched his cryonics arrangements from Alcor to CryoCare — without informing Alcor. The first clue we had was a newspaper interview which noted that Leary was wearing cryonics identification bracelets from two companies (without identifying the companies). Before I could call Tim to ask him what that was all about, I received an e-mail message from CryoCare President Brian Wowk gently chiding me for still telling the press that Leary was an Alcor member. Brian was as stunned as I was to discover that Tim hadn't informed Alcor that he had switched.

We don't know all of the reasons Tim switched to CryoCare, although likely ones included that CryoCare's suspension services provider, BioPreservation, was nearby in Southern California, and that BioPreservation physician Steven Harris had been one of his personal doctors. I have heard that other friends of his in CryoCare spent a great deal of energy in persuading him to change over, perhaps with the idea that a Leary suspension would be good public relations for CryoCare. Tim himself said that he hoped being friendly with both Alcor and CryoCare could provide incentive to bring the two organizations back together to freeze him. (Unfortunately, the real differences be-



tween the two organizations make such a merger unlikely.)

In April of this year, I got a call from a reporter who said that Timothy Leary was giving interviews in which he stated that he was considering committing suicide on-line on his World Wide Web Home Page, to make a statement about controlling one's own death. I told the reporter that I had no comment, that Dr. Leary was now a CryoCare member, and that the reporter should contact CryoCare for that information. I then sent e-mail to Brian Wowk to see what was going on.

Brian noted that CryoCare had consistently advised Tim that suicide was a very bad idea for his cryonics wishes since that greatly increased the risk of

autopsy with the likelihood of severe brain damage. He also told me that Tim was increasingly surrounded by people who were more interested in Tim dying in public than in him getting a cryonic suspension. He feared that these people were preventing Tim from getting proper medical care and that this could be a major problem for the BioPreservation suspension team.

By late April, CryoCare Vice-President Charles Platt was in southern California and in regular communication with Tim Leary and his assistants. However, over the next two weeks, it appears that the relationship between the CryoCare/BioPreservation team and Tim's people deteriorated badly. Tim did not want to follow the medical in-

A letter from Alcor Member Natasha Vita More:

I'll always remember the sunny March afternoon when Tim and I sat together in his backyard, he in his psychedelic black-and-white jacket, me in mod-style. Putting our wrists together, we admired our bracelets--our cryonics bracelets. Suddenly, Tim nudged my arm and motioned to watch the bird flying above. "I'll be with you soon!" he called out. I suppose it was then that I realized dear Timothy Leary viewed his immortality by more than one measure.

I might never fully comprehend why Timothy acted so hastily and regrettably during his last weeks alive. I may never fully understand if a change of course could have occurred and resulted in making his suspension still intact. It has been a few weeks since Tim was cremated. Weeks filled with puzzlement and sorrow.

"Tim had a lot of love for his friends who are cryonicists," Zach Leary (Tim's son) said to me today, June 19th. "He respected the science and the technology of cryonics. His feeling towards cryonics was positive."

Knowing that Tim did not transfer his impasse with one or two individuals onto cryonics in general is an easement. Hearing Tim's appreciation for our diligence in extending and protecting life reaffirmed has been a bit of a comfort in the face of his death. Yet, regardless of knowing this, regardless of Zach's verbal affirmation, I feel an even greater sadness at the ultimate finality of his death. Timothy Leary could have had it all.

structions of Steve Harris and his other physicians, and the other people in the house were not going to do anything Tim didn't want done, whether it was "good for him" or not. In addition, BioPreservation President Mike Darwin became concerned that his transport equipment being stored in the house was in danger of being damaged by the constant stream of visitors and live-in help.

As the situation grew more uncertain, CryoCare officers approached me with the possibility that, since Tim Leary appeared to be growing increasingly frustrated with CryoCare (as was CryoCare with him), Tim might wish to switch back to Alcor. I informed CryoCare (shortly thereafter confirmed by Alcor's Board of Directors) that, while suspension members were not objects to be bargained back and forth between organizations, if Tim specifically asked Alcor to reinstate his suspension membership — and funding could be confirmed — Alcor would be willing to take on the responsibility again.

On Friday, May 3rd, Mike Darwin decided to remove his BioPreservation standby equipment from the Leary home, and explained to Tim why this was being done. Charles Platt reported that "this was accomplished on an entirely cordial basis." However, a Leary family member later told other people that Mike gave Tim a condescending lecture. There are several different opinions on whether this incident caused Tim's resignation or whether it was merely a convenient excuse for what Tim was already planning. In any case, on Monday, May 6th, Tim Leary called Charles Platt and resigned his membership in CryoCare. Charles reported that Tim said "I'm no longer interested in cryonics; I have other plans."

I sent a FAX to Tim asking him if he wanted to discuss cryonics arrangements with Alcor again but received no direct answer. Over the next several days, various Alcor members who were close to Tim spoke with him but only found that he had changed his mind about cryonics.

The first public announcement of Tim's change of mind came on May 9th, in an inaccurate and clumsily written

Los Angeles Times article by David Coker, headed "**Leary Severs Ties to Cryonics Advocates.**" Coker quoted Leary as saying about "cryonics advocates," "They have no sense of humor. I was worried I would wake up in the future surrounded by people with clipboards."

On May 31st, Tim Leary died quietly in his sleep. His last words earlier in the evening were reported to be "Why not?" — words which might summarize his entire life.

But "why not" *cryonics*? What happened to Timothy Leary over the past three months? There are many opinions and, as you might guess, not a small amount of finger pointing. I list the main ones I have heard.

1. Timothy Leary wasn't really a cryonicist at heart. He was more interested in the grand gesture of it — until he found a grander one.
2. Cryonics only seemed like fun to him until he had to face the reality of it.
3. He was persuaded to abandon cryonics by death-loving people around him.
4. Like many dying people, he was less in charge of himself at the end of his life and an easy touch for manipulation.
5. CryoCare/BioPreservation leaders were too unwilling to be flexible with Tim's unusual lifestyle and friends and therefore caused Tim to back away.

It seems mostly likely to me (strictly a personal assessment) that Timothy Leary was a strongly independent thinker who made all of his own decisions and was difficult to manipulate. That leads me to reason #1 as the most likely, probably in combination with #5; but I could easily be wrong. With declining health, he may indeed have been less independent and more susceptible to influence. Indeed, one of Tim's close friends later wrote that he had tried hard to persuade Tim to drop his cryonics plans.

Would Timothy Leary have been suspended if he had not left Alcor? There's no obvious answer. Perhaps Alcor's approach would have been more

tolerable to Tim and his assistants; certainly Alcor had suspension members who were close friends with Tim and who could have lessened friction between him and the transport team. Or perhaps his thoughts were moving inexorably away from life and toward death, and a change in suspension team would have made no difference. With Alcor being farther away from Tim's home than BioPreservation, our staff would have visited him less often over the past few months; so perhaps he would have shifted away from cryonics even sooner as an Alcor member. There is absolutely no way to ever answer that question.

So what do we learn from Timothy Leary's death?

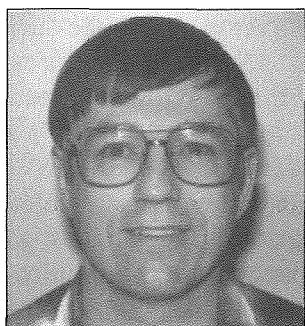
Cryonics isn't simple and it isn't easy. If you want the opportunity to get to the future, it may not be enough to just sign-up and buy insurance. You have to set up your life so that the people around you support your desire to be frozen, to buck you up when you're ready to give up, to remind you that you want to stay alive enough to keep trying even if it takes a lot more work, to support you even when you're upset with the very people trying to save you.

Over the years there have been many celebrities and scientists who seemed like they should be good candidates for

cryonics: Robert Heinlein, Richard Feynman, Gerard O'Neill, Ayn Rand, and others. They all died without being frozen. Now we add Timothy Leary to the list. There will be many others.

Of course, we will miss Timothy Leary; the future will be a less interesting place without him. But he made his decision and I respect it.

Now our focus at Alcor remains where it has always been and must be: 32 people in suspension; 32 friends and heroes who did *not* "drop out." And on *all of you* who will not give up on life.



Right-To-Die On Hold

By David Brandt-Erichsen

The constitutionally recognized "right to die" proved to be short lived. The two federal circuit court rulings reported on in the 2nd Quarter issue of *Cryonics* had legalized physician-assisted suicide (for competent terminally ill adults) in twelve states at the time that issue went to press. As this issue of *Cryonics* goes to press, those two court decisions have been stayed and hence are not in effect. It is now certain that they will remain stayed until the U.S. Supreme Court either decides not to hear the cases (which will take about six months) or issues a ruling to decide the issue (which will take about two years). It looks like we are in for a long wait.

During the time that the circuit court rulings were in effect, no cases of physician-assisted suicide were reported. The Ninth Circuit ruling remained in effect for two months (from March 6 to

May 6), when the Ninth Circuit issued a stay on its own ruling until the entire 25-judge panel could decide to re-hear the case. On May 29th the Ninth Circuit decided not to re-hear the case, and the stay was automatically lifted. Within hours, however, U.S. Supreme Court Justice Sandra Day O'Connor (who oversees the Ninth Circuit) issued another stay until final appeal papers must be filed with the Supreme Court by July 4. On June 10 the Supreme Court decided to continue the stay until it decides whether or not to hear the case.

The Second Circuit ruling remained in effect for only 16 days when on April 18 the Second Circuit issued a 30-day stay on its own ruling to provide time for the New York Attorney General to file an appeal to the Supreme Court. On May 20 a new stay was issued when the appeal was filed, and this stay should remain in effect until the Supreme Court

decides if it will hear the case.

Meanwhile, the Oregon Death with Dignity Act is still on hold as well. It is still on appeal to the 9th Circuit but no hearing date has been set as of this writing, and a ruling will not be issued until several months after the hearing. There was a hearing before District Judge Michael Hogan on April 24, asking him to lift the injunction blocking the Act, but as of this writing he has not issued a decision. This case may also eventually work its way to the Supreme Court. Of the three cases, this one has the best chance of winning. A fourth case has been filed in a Florida District Court, but no hearing date has been set as yet.

Updates on the changing legal situation will be provided in the *Alcor Phoenix* and in a more timely manner on CryoNet.

A Multi-Media Report

By Stephen Bridge

***Synthetic Pleasures* — A film *.DOCumentary**

Directed by Iara Lee, Produced by George Gund

Extropian Iara Lee has looked at the future and found it both strange and exhilarating. While the visual style of this 1996 documentary is perhaps too reminiscent of an updated psychedelic '60s film, the subjects are more up to date. Or perhaps not. In various '60s films we were shown how psychedelic drugs, sex, rock-and-roll, alternate reality, and strange fashion would create a new world. *Synthetic Pleasures* shows us the new world that might result from smart drugs, future sex, bionics, cryonics, nanotechnology, virtual reality, and fashions in ...uh.... body piercing?

Perhaps the common theme here is the futuristic "hubris" of Ed Regis's book, *Great Mambo Chicken and the Trans Human Condition* (Addison-Wesley, 1990). Both Regis and Lee (wouldn't they make a great team on TV's *Regis and Kathie Lee*?) imagine that humans will take nature, twist it to their own design, improve it, or discard it entirely — and in the process become some-

thing more than "human," at least in the traditional sense.

Some of the guests interviewed include Cryonics Institute President Robert Ettinger, Extropy Institute President Max More, Ed Regis, computer writer/satirist R.U. Sirius, Grateful Dead guy John Perry Barlow, the French body-surgery-as-art performance artist Orlon, and the now late Timothy Leary. You'll also notice some Alcor suspension footage.

If you're a well-read Extropian, you won't see many new ideas here. But if you want something to show your neo-Extropian friends to set up some wild-idea flinging of your own, or you want to give your older family members one more chance to gasp in bewilderment at what this younger

generation is coming to, make sure you get them to *Synthetic Pleasures*. I don't see this film suddenly creating a market for cryonics; but it's a fun couple of hours.

See the box below for scheduled theatre dates, or for current dates, go to the web page of Caipirinha Productions at <http://www.caipirinha.com>.

We understand that dates are still being negotiated for Arizona and other states. College campuses are a good bet for this. If you want to arrange a booking for your area, contact Caipirinha Productions at caipirinha@caipirinha.com or 212-410-5117.

Alcor Media Appearances

In the last year Alcor was featured

Confirmed theatrical release dates for *Synthetic Pleasures*

Aug 29 - Sept 04: Los Angeles, CA - Nuart Theatre
Aug 30 - Sept 05: San Francisco, CA - Castro Theatre
Aug 30 - Sept 05: Berkeley, CA - UC Theatre
Aug 30 - Sept 05: open ended - San Jose, CA - Towne Theatre
Aug 30 - Sept 05: open ended - Palo Alto, CA - Aquarius Theatre
Sept 07 - Sept 12: San Diego, CA - Ken Theatre
Sept 13 - Sept 26: open ended - NYC, NY- Cinema Village
Sept 13 - Sept 15: Larkspur, CA - Larkspur Theatre
Sept 20 - Sept 26: open ended - Boston, MA- Kendall Square Theater
Sept 27 - Oct 03: open ended - Austin, TX- Dobie Theater

on the *Discovery Channel* shows, "The Know Zone" and "Next Step" (especially well-done). These two shows will be repeated for years. Two other *Discovery Channel* programs, "Beyond 2000" and "Why Things Are," have filmed here, and the cryonics episode of "Why Things Are" will air on Sunday, September 15, at 9:00 pm.

It looks like the eagerly awaited "Cryonics: Souls on Ice," a one-hour documentary, will probably air on the *Discovery Channel* Sunday evening, October 20. We feel this might be the best program on cryonics ever filmed. We will send out special announcements once the final details are known.

MTV was here to shoot a short news piece for their new program "Zoo TV" (our segment will probably be broadcast in August). The *Learning Channel* program "The Quest" will also feature Alcor and cryonics on a fall episode. A *BBC* documentary on rejuvenation supposedly included a segment on Alcor, but we don't know if it has been broadcast yet. Another *BBC* fall program, "Future Fantastic," will include a segment on Alcor. Finally, *CNN* has filmed here for a possible special feature on Alcor, date to be determined.

Marina Benjamin, a writer for the *Sunday Times* magazine of London, visited here for a major article on cryonics and Alcor which will appear sometime in July.

Get Together and Have Fun

If you want to visit with Alcor members and other cryonicists, there are several upcoming opportunities.

■ *The 1996 Venturist Festival*, September 6 and 7 at the home of Dave and Trudy Pizer in Scottsdale (5 minutes from Alcor). Attendees can also attend the Alcor Board Meeting and annual Directors election on Sunday, September 8. (The Venturists are not

affiliated with Alcor.) For more information, call Dave Pizer at 602-596-4008.

■ *The Alcor Cryo-Feast*, December 8, 1996 at 1:00 p.m. The place is not set but save the date on your calendar. We're trying to arrange this year's party in Northern California for a change. This is a relaxed party where you can share ideas with many cryonicists who have been only words or voices to you in the past.

■ *The Fourth Annual Anti-Aging Medicine Conference*, December 14-16, 1996 at Alexis Park Hotel in Las Vegas.

Alcor will be an exhibitor. Registration Fees are \$345 for A⁴M Members, \$385 for Life Extension Foundation members (that does not mean "Alcor" members), and \$445 for the general public. The rates increase by \$50 after October 9, 1996, and are \$200 per day at the door. For more details, contact the American Academy of Anti-Aging Medicine at 401 N. Michigan Avenue, Suite 2400, Chicago IL 60611-4267. Phone 312-527-6733; FAX 312-321-6869

■ *Alcor's ACT (Advancing Cryonics Technology) Festival*, January 31, February 1-2, 1997 here at Alcor in Scottsdale, Arizona. Registration and details on speakers will be available later in the year. It's a great month to visit Arizona.

To keep up on Alcor television appearances, magazine articles, and conferences, check in on the "Current Events" section of Alcor's Home Page on the World Wide Web: <http://www.alcor.org>

Membership Status

Alcor has 389 Suspension Members, 453 Associate Members (includes 64 in the process of becoming Suspension Members), and 32 patients in suspension. These numbers are broken down by country below.

Subscribers			Subscribers		
Country	Members	Applicants	Country	Members	Applicants
Argentina	1	0	Lithuania	0	0
Austria	2	0	Malaysia	0	0
Australia	12	1	New Zealand	0	0
Belgium	0	1	Russia	0	0
Canada	10	2	Spain	6	0
China	1	0	Sri Lanka	0	0
France	0	2	Sweden	0	0
Germany	2	0	Netherlands	0	0
Ireland	0	0	U.K.	18	2
Italy	0	2	U.S.A.	337	53
Japan	0	1	Ukraine	0	0
			TOTALS	389	64

Continued from page 11

seems out of the question. And the money to fund such research is far more likely to be easy to raise from all cryonicists rather than just from Alcor members, or CryoCare members, or ACS members, or CI members. Several years ago, noticing the need for a publication which would print such research even if it does not fit in major journals and the Cryobiology Society refuses us, I set up an Institute for Neural Cryobiology — which so far has gotten very few contributions. Sharing our knowledge at this point may be far more effective than trying to keep it only within a particular society or even corporation. (I say this not because I dislike private profit-making enterprises, but because the history of such enterprises *within cryonics* has so far been a dismal record of failure).

And the more we can cooperate, the closer we can someday bring a day when we can state firmly, with no doubt at all, that our patients are *alive*.



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All prices include postage and handling and are in U.S. dollars. Minimum order: \$5.00. Overseas orders must be paid with U.S. dollars by Traveler's Cheques or International Money Order, and must include an additional 20% (of total) for shipping.

All orders are subject to availability and all prices are subject to change.

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- ☐ *The Prospect of Immortality*, by R. Ettinger \$11.00
- ☐ *The 120-Year Diet*, by Roy Walford \$ 5.95
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- ☐ *Cryonics* back issues on disk/fiche (circle) \$120.00

The Alcor Phoenix, 1-year (8-issue) Subscription

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- ☐ Alcor Membership Application Fee \$150.00

ARTICLES & REPRINTS

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- ☐ *The Molecular Repair of the Brain*, by Ralph Merkle, Ph.D. \$ 3.00
- ☐ *Will Cryonics Work?* by Steve Harris, M.D., plus *Why Cryonics Probably Will Work*, by Michael Perry, Ph.D. \$ 3.50
- ☐ *Freezing of Living Cells, Mechanisms and Implications*, by Peter Mazur, Ph.D. \$ 2.50
- ☐ "Cryobiology and the Feasibility of Cryonics Package" (all 4 of the above articles) \$ 7.50

Nanotechnology

- ☐ *There's Plenty of Room at the Bottom*, by Richard P. Feynman, Ph.D. \$ 1.50
- ☐ *Molecular Technology and Cell Repair Machines*, by K. Eric Drexler, Ph.D. \$ 2.00
- ☐ *Nanotechnology*, by Brian Wowk \$ 2.50
- ☐ *Cell Repair Technology*, by Brian Wowk \$ 2.50
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Memory, Identity, and the Brain

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- ☐ *A Commented Bibliography on Brain and Memory*, by Thomas Donaldson, Ph.D. \$ 2.00
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Cryonic Suspension Reports

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- ☐ *A Well-Loved Man*, by Mary Margaret Glennie \$ 2.00

Alcor Legal History

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General

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About the Alcor Foundation

The Alcor Life Extension Foundation is a non-profit tax-exempt scientific and educational organization dedicated to advancing the science of cryonics and promoting it as a rational option. Alcor currently cares for 31 patients in cryonic suspension, and has hundreds of signed up Members. Being an Alcor Member means knowing that—should the worst happen—Alcor's Emergency Response Team is ready to respond for you, 24 hours a day and 365 days a year.

Alcor's Emergency Response capability includes equipment and trained technicians in Arizona, New York, Indiana, Northern California, Southern California, and England, and a cool-down and perfusion facility in Florida. Alcor's Arizona facility includes a full-time staff with employees present 24 hours a day. The facility also has a fully equipped research laboratory, an ambulance for local response, an operating room, and a patient care facility using state-of-the-art storage vessels.

Meetings

Board of Directors Meetings

Alcor business meetings are held on the first Sunday of every other month: January, March, May, July, September, and November. (The July and September meetings are on the second Sunday.) Guests are welcome. Meetings start at 1 PM. For more information, contact Alcor at:

ALCOR
7895 East Acoma Dr., #110
Scottsdale, AZ 85260
(602) 922-9013

Directions: Take the 10 to the 17 North-bound, exit Thunderbird Road heading East. Thunderbird will turn into Cactus St, stay on Cactus until you turn left on Tatum, and then right on Thunderbird (which will turn into Redfield in about 3 miles), then (after a quarter mile on Redfield) left on 76th Place. 76th Place turns into Acoma Drive; Alcor is on the right at 7895 Acoma Dr., Suite 110.

Southern California

The Southern California chapter of Alcor meets every month in an informal setting in one of our member's homes. Meetings are on the fourth Sunday of the month. For more information, call Michael Riskin at (714) 879-3994.

Boston

There is a cryonics discussion group in the Boston area meeting on the second Sunday each month. Further information may be obtained by contacting Tony Reno at (508) 433-5574 (home), (617) 345-2625 (work), 90 Harbor St., Pepperell, MA 01463, or reno@tfn.com (email). Information can also be obtained from David Greenstein at (508) 879-3234 or (617) 323-3338 or 71774.741@compuserve.com (email).

District of Columbia

Life Extension Society, Inc. is a new cryonics and life extension group with members from Washington, D.C., Virginia, and Maryland. Meetings are held monthly. Call Mark Mugler at (703) 534-7277 (home), or write him at 990 N. Powhatan St.; Arlington, VA 22205.

Bay Area

Alcor Northern California meetings: Potluck suppers to meet and socialize are held the second Sunday of the month beginning at 6:00 PM. All members and guests are welcome to attend. There is a business meeting before the potluck at 4:00. For meeting information, call Alcor at 1-602-922-9013

England

There is an Alcor chapter in England, with a full suspension and laboratory facility south of London. Its members are working to build a solid emergency response, transport, and suspension capability. Meetings are held on the first Sunday of the month at the Alcor UK facility, and may include classes and tours. The meeting commences at 11:00 A.M., and ends late afternoon. The address of the facility is:

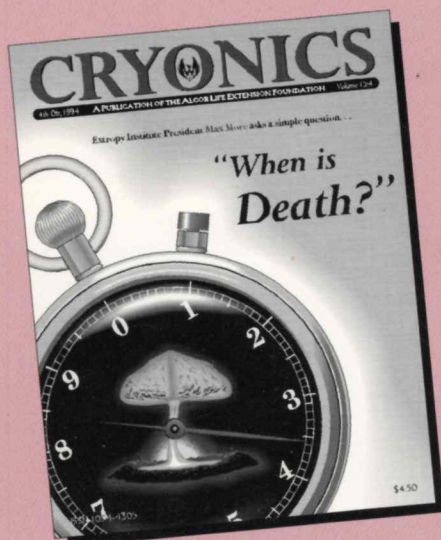
Alcor UK
18 Potts Marsh Estate
Westham
East Sussex
Tel: 01323 460257

Directions: From Victoria Station, catch a train for Pevensey Westham railway station. When you arrive at Pevensey Westham turn left as you leave the station and the road crosses the railway track. Carry on down the road for a couple of hundred yards and Alcor UK is on the trading estate on your right.

If you're coming to an AUK meeting you should phone ahead since meetings are sometimes rescheduled. Call Garret Smyth on 0181 789 1045 or

Garret@destiny.demon.co.uk
or Mike Price on 0181 845 0203 or Alan Sinclair on 01273 585974. Note: the email address listed above for Gattet is different from the previous erroneous listing.

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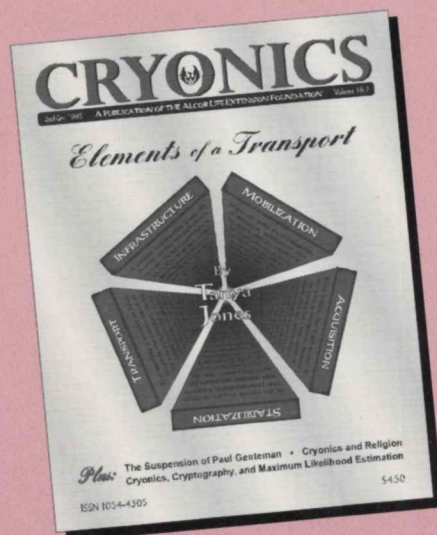


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