

# Cryonics

A black and white photograph showing a person in a white cryopreservation suit and mask, likely a cryonicist, working on a patient in a medical setting. The person is leaning over the patient, who is lying on a table. The background is dark and industrial, with various pieces of equipment visible.

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## The Suspension of Patient A-1399

by Tanya L. Jones

## Cryonics is...

Cryonic suspension is the application of low-temperature preservation technology to today's terminal patients. The goal of cryonic suspension and the technology of cryonics is the transport of today's terminal patients to a time in the future when cell/tissue repair technology is available, and restoration to full function and health is possible—a time when freezing damage is a fully reversible injury and cures exist for virtually all of today's diseases, including aging. As human knowledge and medical technology continue to expand in scope, people who would incorrectly be considered dead by today's medicine will commonly be restored to life and health. This coming control over living systems should allow us to fabricate new organisms and sub-cell-sized devices for repair and resuscitation of patients waiting in cryonic suspension.

## Alcor is...

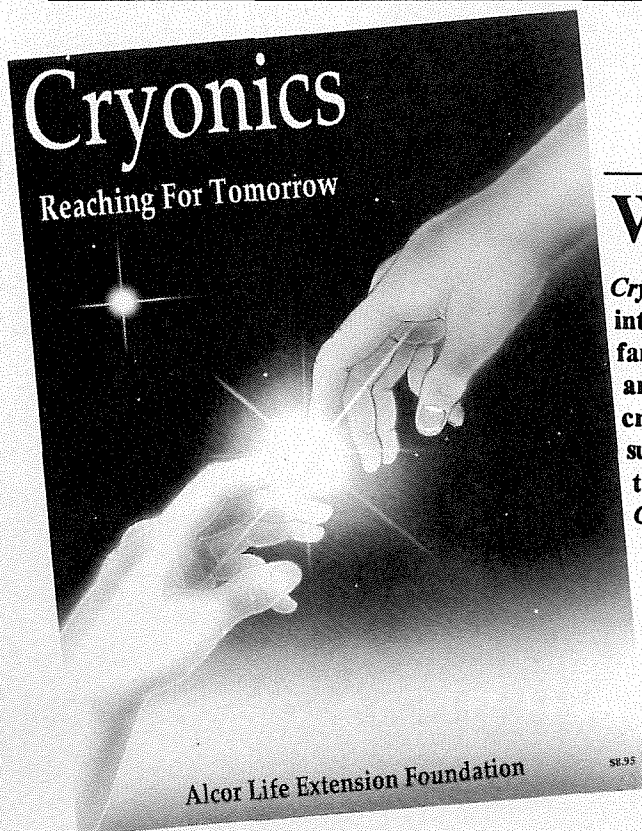
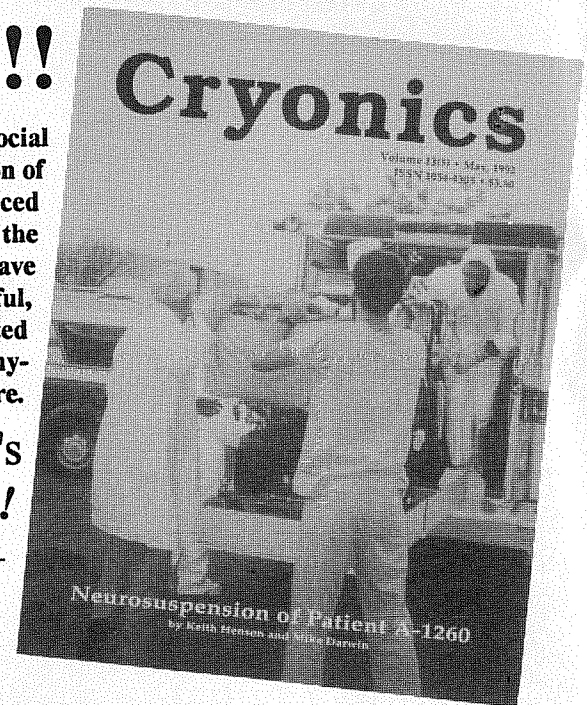
The Alcor Life Extension Foundation is a non-profit tax-exempt scientific and educational organization. Alcor currently has 27 members in cryonic suspension, hundreds of Suspension Members—people who have arrangements to be suspended—and hundreds more in the process of becoming Suspension Members. Our Emergency Response capability includes equipment and trained technicians in New York, Canada, Indiana, North California, and England, and a cool-down and perfusion facility in Florida.

The Alcor facility, located in Southern California, includes a full-time staff with employees present 24 hours a day. The facility also has a fully equipped and operational research laboratory, an ambulance for local response, an operating room, and a patient storage facility consisting of several stainless steel, state-of-the-art storage vessels.

# Subscribe to *Cryonics*!!!

*Cryonics* magazine explores and promotes the practical, scientific, and social aspects of ultra-low temperature preservation of humans. As the publication of the Alcor Life Extension Foundation—the world's largest and most advanced cryonics organization—*Cryonics* takes a realistic, real-world approach to the challenge of maintaining in a biologically unchanging state patients who have reached the limitations of modern medicine. *Cryonics* contains thoughtful, provocative discussions of cryonic suspensions performed by Alcor, related research, nanotechnology and molecular engineering, book reviews, the physical format of memory and personality, the nature of identity, and more.

First-time subscribers get one entire year -- that's twelve issues -- for only \$15. **SUBSCRIBE!!!!**



## Want Detailed Information?

*Cryonics: Reaching For Tomorrow* is truly the world's only "textbook" introduction to cryonics. Over one hundred pages long, *C.R.F.T.* is a fantastic and unique examination of the social, practical, and scientific arguments that support the continuing refinement of today's imperfect cryonic suspension techniques, with an eye toward eventual perfected suspended animation. *C.R.F.T.* is also a comprehensive introduction to the Alcor Foundation. This book is free with your \$15 subscription to *Cryonics* magazine, or can be purchased separately for 7.95.

To subscribe to *Cryonics* magazine and receive a free copy of *Cryonics: Reaching For Tomorrow*, or to order *C.R.F.T.* alone for \$7.95, call 1-800-367-2228, or write to the Alcor Foundation at 12327 Doherty Street/ Riverside, CA 92503.

# Cryonics

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Cover: *Tanya Jones begins the femoral cutdown during the suspension of patient A-1399.*

## Judging the Cover by the Book

A few subscribers called to let us know that the new printing format for *Cryonics* was not standing up to the trials of bulk mail as well as we might've hoped. As a first-run attempt to deal with this, we've had this issue paper-wrapped. This is *far* more economical than envelope mailing, so we hope it will suffice. However, we will still be noticing the cost, and we may abandon this procedure if it fails to offer substantial protection, so please *let us know* if you think that the improved condition of the magazine arriving in your mailbox justifies the expense.

## Liven Up Those Lazy Days of Summer!

Summer is just about upon us, and for many of us this means *free time*. If you're among those whose schedules are about to lighten up, you might consider blocking out a few days (or maybe even a few *weeks*) to visit the Alcor facility and assist with a few of the many, many projects which are awaiting the dedicated efforts of someone like yourself. The manner and number of tasks that need attention is as daunting (and challenging!) as ever, but of course *many* of the things that need doing require no special training, just inclination and effort.

It's possible that some local members can assist with your lodging, and Alcor *may* be able to assist somewhat with your travel expenses, depending on the expected time and length of your stay. Don't miss this opportunity to help, learn, grow, experience, and interact.

## In This Issue

The most eye-grabbing piece in this issue is certainly Tanya Jones' "On the Road Again..." a report of Alcor's most recent cryonic suspension. The white suits worn in many of the pictures are not Alcor uniforms, but Tyvek protective clothing to protect the Transport and Suspension Teams from the AIDS virus. As you will read, the suspension proceeded quite smoothly, and the patient received the highest concentration of glycerol yet achieved in a cryonics patient, which means the lowest amount of damage from ice formation during freezing.

On the lighter side, you'll find in this issue "Revival," a very enjoyable bit of speculative fiction by Alcor Member David Krieger. As you might intuit, the story describes the reactions and wonderment of a just-revived Alcor patient as he confronts the excitement of a humane and technological future. David's writing style and technological savvy are impeccable; his story is a thrilling glimpse of a could-be future.

On the *still lighter* side, check out the reprint of "Carla Cranks Alcor" in the "Letters. . ." section. This ran in the last issue of *boING boING*, a refreshing and independent publication of future-oriented ideas and fiction. The Alcor employee "David" is actually Derek Ryan, our Membership Administrator. As you'll see, Derek (after taking a moment to get oriented) does a fantastic job of turning a pointedly ludicrous call into an opportunity to explain our entire operating philosophy.

## First Class Cryonics

We wish that we could afford to send all subscribers and members their monthly *Cryonics* via first class mail, but of course this would cost us literally thousands of dollars more per year. However, if you're disappointed with the mailing delay necessitated by bulk mail, you can receive *Cryonics* via first class mail (and in an envelope!) by adding \$12 to your yearly subscription fee. If you're a Suspension Member, you can have this amount added to your E.R.(dues) billing. Either way, First Class *Cryonics* is just a dollar a month away!

## Fee Motion Hearing Approaches

At 8:30 a.m. on the morning of June 17th, attorney David Epstein of Garfield, Tepper & Epstein will represent Alcor in our motion to recover fees in the *Alcor v. Mitchell* case, more popularly known as "The Health Department Case." The total amount of attorney fees for which Alcor stands to be compensated (or not) by the State Health Department is \$93,721.25. (Of course, G. T. & E. will receive one-third of this if the case succeeds.)

The hearing will take place in Los Angeles Superior Court.

## Becoming an Alcor Associate Member (Subscriber):

Becoming an Associate Member of Alcor is simply a matter of subscribing to *Cryonics* magazine, only \$15 for first-time subscribers. This price includes a *free* copy of *Cryonics: Reaching For Tomorrow*, the 100+ page introduction to cryonics and Alcor. (This can be purchased separately for \$7.95.)

## Becoming an Alcor Suspension Member:

Making arrangements to be cryonically suspended in the event of your "legal death" is not the complicated task it once was. The Application Fee is now only \$100 (some restrictions apply), and includes the *complete* preparation — by Alcor's Membership Administrator Derek Ryan — of all legal documents necessary for your Suspension Membership. (This does not include payment arrangements, such as a life insurance policy, though our staff can assist and advise you in acquiring such a policy.)

## Who to contact for information about:

- *Cryonics* Magazine — Ralph Whelan
- Emergency Response Billing (Dues) — Joe Hovey
- Your Documents / Financial Arrangements for Suspension — Derek Ryan
- Transport / Suspension Team Procedures, Positions, and Training — Tanya Jones
- Patient Care Policies and Procedures — Mike Perry
- Administration / Management of Alcor — Steve Bridge

All of these Alcor Staff Members can be reached at 909-736-1703. If you are not currently a member or subscriber, feel free to call us at 800-367-2228 with your questions or requests for more detailed information.



## Letters to the Editor

To the Editors:

Although those who know me will hardly be surprised, I was disappointed by the last (February) issue. Since he's actually started to do real things for cryonics, Keith has improved, but I note in his piece the phrase "when nanotechnology comes..." which counts in my mind as a theological rather than scientific statement. I was also glad I did not personally attend the conference on nanotechnology (though it should have been reported). It seemed from my reading that it was long on theory (which unfortunately has not been verified with even one working nanomachine to Eric Drexler's specs) and short on substance. It is true, though, that as our individual computers grow in power it will become possible to have a CAD program which will actually verify whether a machine put together out of the parts which have been drawn so nicely will actually work. I, too, await that day.

One point, though, is *very important*. Nanotechnology is not "coming." It is already here. Every system for modifying or inserting genes into living creatures (used so much now they are routine on experimental animals, but still vehemently opposed for medicine) is an instance of nanotechnology. Drug design is ceasing to be merely empirical; instead we are coming to know enough that we can actually design a chemical to have the desired effect. All of that, in the root sense of the word, *is* nanotechnology. And how anyone can claim that genetic modification to cure cystic fibrosis is *not* nanotechnology is a mystery to me.

This even bears on cryonics. Even after storage in LN<sub>2</sub> cells (and therefore tissues), when heated up to normal temperatures, are *not* simply passive objects. There are indications, for instance, that embryonic nerve tissue can recover from many of the insults of freezing by itself. The fact that our adult nervous system has processes which (for some reason yet to be understood) actively interfere with repair in the case of other injuries is very important to understanding any problems we might have with repairing suspension damage. Salamanders have been known for a long time to have massive self-repair abilities, even for their nervous systems — a highly relevant fact for the current experiments on whether or not their mem-

ories survive freezing. All of these facts suggest (no, they don't *prove*) that any serious attempt to repair freezing injury must at a minimum take account of these processes, and at a maximum actually understand, modify, and use them. And since we work by "nanomethods" on a nanoscale, all such understanding and use will be one more instance of nanotechnology. And work is going on *right now* to understand many of these processes: that is fundamentally what the entire study of neurological growth and development concerns.

Indeed, even for people who believe that we can fix our problems by simple uploading (I doubt this, but that isn't my point here), all of these wet workings of our brains remain critically important. How can we upload anything if we can't even read off the memories, as yet?

Every one of these subjects, when looked at *technologically*, becomes an instance of nanotechnology. Perhaps someday we'll have universal biochemical machines; but there is no present use of biochemistry or molecular biology which does not qualify as nanotechnology *now*. What we want is not the arrival of nanotechnology but its *improvement*. And as cryonicists, that should mean improvement by any and all means.

Best, and long life to all,  
Thomas Donaldson  
Half Moon Bay, CA

To the Editor:

The independently audited financial statements [*appearing in Cryonics May, 1993. — Ed.*] confirmed what has been evident (at least to me) for over a year:

1. Alcor has grown out of its income shortfall (or into its spending habits, depending on how you like to look at it).

And

2. Cash flow problems in the General Fund will continue to be a major headache for management.

The Statement of Revenues and Expenses shows that where expenses exceeded income, it wasn't by much: overall,

in the consolidated total the portion of our expenses in excess of revenues was less than 0.8%! As expected, the General Fund was the biggest loser: its portion of expenses in excess of revenue was 5.67%. Patient Care and Research both had surpluses. The Endowment Fund isn't supposed to have any material activity (and it didn't), but the value of some of its investments dropped, resulting in a loss of \$200.

Two reasons why we can expect to see a surplus in the General Fund for 1993 are the recent dues increase (this will bring in at least another \$10k), and the absence (so far) of any legal bills (\$38k — 12.72% — of '92's expenses). These factors give us a \$31k projected surplus, assuming no major catastrophes. Unfortunately, as of this writing there is at least the possibility that we will have one debacle worth around \$25k. But that still would leave a projected surplus of \$6k. On the upside for '93 is the fact that some substantial expenses were accrued, and some income was deferred in 1992 (including donations for the audit) — this means that these sums will lessen expenses and augment income this year. And next year's audit (assuming we have one done) should cost about \$10k less than it did this year.

Alcor had a positive cash flow in 1992, and should do even better in '93. (Cash flow is the sum of net surplus (or loss) and depreciation.) The reason cash flow is a problem is because of the uneven and untimely nature of it in our type of "business." In the consolidated totals, the positive cash flow was \$17k. Patient Care had a positive cash flow of nearly \$20k (and depreciation here is not as significant as one would think, since bigfoot dewars are being written-off over 20 years and we expect that they will have a much longer life span).

Only the General Fund had a negative cash flow: \$6,343. (I found it manageable.) With the dues increase alone, we should see a positive cash flow here as well in 1993, but it will still be uneven. Back in March, I had posted some ball-park numbers to the Cryonet which were based on Joe Hovey's preliminary numbers and my personal knowledge (that posting was reproduced in the April issue of *Cryonics*). As it turns out, I was very nearly on the mark and happily erred on the side of pessimism. The audited financial statements are a cause for relief (espe-

## "Carla Cranks Alcor":

The following is reprinted (with permission, of course) from the latest (#10) issue of *BOING BOING* magazine (which this editor recommends highly to the intellectually playful and technologically inclined). Carla, aka "Katie," is co-Editor-in-Chief (with Mark Frauenfelder) at *BOING BOING*. Alcor Membership Administrator Derek Ryan — appearing as "David" below — does an admirable job of dealing with Carla's mischievousness.

For a subscription to *BOING BOING*, send \$14 (\$20 outside the U.S.) to 11218 Ventura Blvd. #818, Studio City, CA 91604. Single issues are \$4 (\$6 outside the U.S.).

Carla Cranks Alcor, a Cryonic Preservation Company

## COLD-HEARTED PRANK

Alcor: (receptionist) Alcor Foundation.

**BOING-BOING:** Yes, hi, I'd like to speak to someone in the freezing department.

The what?!

You know, the people in charge of signing people up.

Uh, one moment please. Your name?

My name is Katie.

(pause)

Hi this is David. (name has been changed)

**Hi! This is Katie. I live in Los Angeles, and I was wondering how much it would cost to freeze my arms.**

To freeze your arms?!

Yeah.

Hmm (nervous chuckle) uhh, actually, that's not something I think we've ever done. I don't know if it's not something we would ever do. But I'd be the wrong person to talk to about that. I'm the membership administrator, I get people signed up for cryonics.

**Well what other parts have you frozen then?**

We'll either freeze a person's whole body or just their head. Can you explain to me why it is you only want your arms frozen?

**Because that's the best part of my body.**

Er...um...a... (another nervous chuckle) Are you talking about after your death you want them frozen?

**Well, yeah. Everyone always compliments my arms. My arms are great. They're tan, thin and very smooth. So I want to freeze them.**

Hmm, well, why don't you hold on a second.

Okay.

(pause)

Hi, it's David again. Uh, I just spoke with our vice president, and he said that's just something we cannot do.

**How come?**

Well, he didn't give me specific reasons for it, but he was very emphatic.

**What does that mean?**

Well I, uh, he was, (chuckle) it's definitely, uh,

**No!**

Yeah, definitely (chuckle) that we, we, we won't do that. Our basic purpose is, uh, the uh,

**Well what if somebody needs arms later on? Mine would be great.**

We'll actually, uh, I don't know how much you know about cryonics or anything, but uh, by the time we have the technology to bring these people out of suspension, the actual cloning of cells will be a very simple thing. You might want to have your tissue samples stored at a tissue storage bank or something. That's where the pattern that makes your arms what they are is - in your DNA. But, uh, our basic purpose is people who want to take the chance to continue to live by having themselves frozen when and if they die. But we're not really here to freeze body parts.

**Hmm, well you said that you freeze heads.**

Well, when we just freeze heads it still carries out our main motivation, which is getting the person to the future. Your brain is basically what contains who you are. You can cut off your hand or your arm, and you still have all your memories, all of your personality. Of course you'd still be psychologically altered, but you would be the same person. Whereas, if I cut off a part of your brain, uh, you would be a completely different person. The basic reasoning for just freezing your head is the technology required to reverse what's wrong with the patient, you know, what caused them to die in the first place will be much more advanced technology than that required to just clone cells...

**Oh boy.**

... and basically just grow a whole new body.

**Huh. Well I really wouldn't want to just leave my brain.**

Well if you don't freeze your brain, then you're not really freezing you, you're just freezing a part of you. Our interest isn't really in having organ donations or body-part donations - it's in attempting to transport people to the future, where technology can repair what's wrong with them and help them to continue their life.

**Oh, I don't think my brain is smart enough for that.**

Okay. No problem.

**Well thank you! ☺**

cially from the "Chicken-Little" financial predictions that we've been bombarded with for the past year).

Financially, things went well for Alcor in 1992. I expect the new management to do much better this year (and in years to come). Continued positive cash flows are virtually assured. And any degree of success in management's fundraising drives, membership growth initiatives, and cost containment efforts should produce a meaningful across the board surplus for 1993.

Regards,  
Carlos Mondragón  
Beaverton, OR

*Carlos was Alcor's President from 1988 to January of this year. — Ed.*

*Cryonics:*

I am dismayed at the letters critical of Ralph Whelan's article on the Daly suspension and the manner in which Alcor management handled the situation. Ralph is absolutely right in having concluded that neither he or anyone else at Alcor had any right to have this person hauled off in a straight jacket and incarcerated in a mental hospital. Becoming an Alcor member does not give the organization that sort of power over members' lives. Certainly if it did, I wouldn't be signed-up myself.

The right to control one's own life necessarily includes the right to end that life. This is not just libertarian dogma, it is at the core of my own personal value system. This kind of respect for the rights of others is what makes productive cooperation among individuals possible. Or else we would all be in a constant state of conflict, nervously anticipating the next assault by one's "friends." Those who want Alcor to have this kind of control over them should put that desire in writing and send it in. (As much as you may really like and respect them, do you really want the Alcor staff deciding when you are crazy enough to be locked up?)

If I ever decide to end it all, understand this clearly: You do not have a right to interfere with me. If you can't accept that moral point of view, then consider the practical aspects: *Eventually I'll get out!*

Ever forward,  
David Cosenza

*Cryonics:*

In the February, 1993 *Cryonics* Forum, page 4, it mentions near the bottom of column one that my wife, Terry Cannon, was the first patient to be perfused with the "current" system of perfusion, in 1987.

This might sadden the families and friends of patients who were suspended prior to 1987.

The date of my wife's suspension is incorrect. She was suspended in mid-February of 1985. Therefore, any patient suspended after 1985 (mid-February) should have received the improved pro-

cedures. This should be comforting to those concerned with suspension between mid-February 1985 and 1987.

Yours truly,  
Joseph G. Cannon  
Avon Park, FL

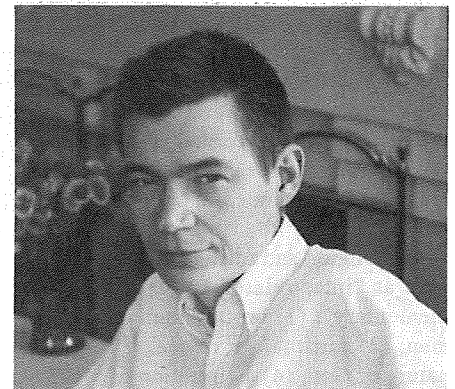
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## For the Record

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# Religion and Cryonics

by Michael Perry



In life's search for meaning, a recurring theme is transcendence. Man, from time immemorial, has longed to reach beyond the biological limits of existence and become something more than human. Cryonics is a modern movement that is firmly rooted in that tradition, but it has many antecedents, notably in the considerable field of organized religion. At first glance it might be thought that religion and cryonics, though clearly having "something" in common in their preoccupation with the problem of death, would have little to say to one another. Both address the problem, after all, in rather different ways. There are many cryonicists who are not religious; on the other hand, most who are religious are not cryonicists. Both, however, are concerned with the same fundamental issues — survival, happiness, the meaning of life, and the long-term future — and thus have more in common than appearances might suggest. In particular it was recognized early that cryonics and religion (mainly, Christianity, which is the widespread religion and part of the Western culture that also gave rise to cryonics) can have a common meeting-ground. In this way cryonics can be viewed as a reasonable continuation of other efforts to achieve a better and more meaningful life. Here I'd like to explore some of the writings and happenings that recognize the common

ground between cryonics and religion, then offer some brief thoughts for the future.

First, let's take a rather long backward glance — to Alexandria, Egypt in the 3rd century a.d. Although the times were ancient, the thinking in this cultural crossroads and intellectual center was often profound. For the Christian speculative theologian Origen, a burning issue was how to properly develop into a more-than-human, assuming one made the proper exit from this life. In particular, he imagined that the hereafter would be a *learning experience*, a process of continual advancement:

"And so the rational being, growing at each successive stage, not as it grew when in this life in the flesh or body and in the soul, but increasing in mind and intelligence, advances as a mind already perfect to perfect knowledge, no longer hindered by its former carnal senses, but developing in intellectual power, ever approaching the pure and gazing 'face to face,' if I may so speak, on the causes of things. And it attains perfection, first that perfection by which it rises to this condition, and secondly that by which it remains therein, while it has for the food on which it feeds the problems of the meaning of things and the nature of their causes."<sup>1</sup>

This "perfection," however, would be no static condition obviating further advancement, as another passage makes clear:

"For no created mind can by any means possess the capacity to understand all; but as soon as it has discovered a small fragment of what it is seeking, it again sees other things that must be sought for; and if in turn it comes to know these, it will again see arising out of them many more things that demand investigation."<sup>2</sup>

This, I submit, is rather similar in broad outline to some much more recent immortalist thinking. After all, we are not likely to remain *forever* in our present biological housing, and we *do* want to develop in intelligence and understanding, as well as in other ways that may be difficult to imagine. At the same time, we will certainly never understand or *do everything* but must always seek new knowledge and experience, and progress beyond our previous levels.

From this ancient but insightful viewpoint let's now jump forward, first to the 1800s. I mention in passing the great 19th-century Russian philosopher Fyodorov, who envisioned conquering death through scientific means but in his own way was also deeply religious, seeing in this scientific triumph the fulfillment of

the divine purpose. Fyodorov has been discussed more fully in a previous column.<sup>3</sup>

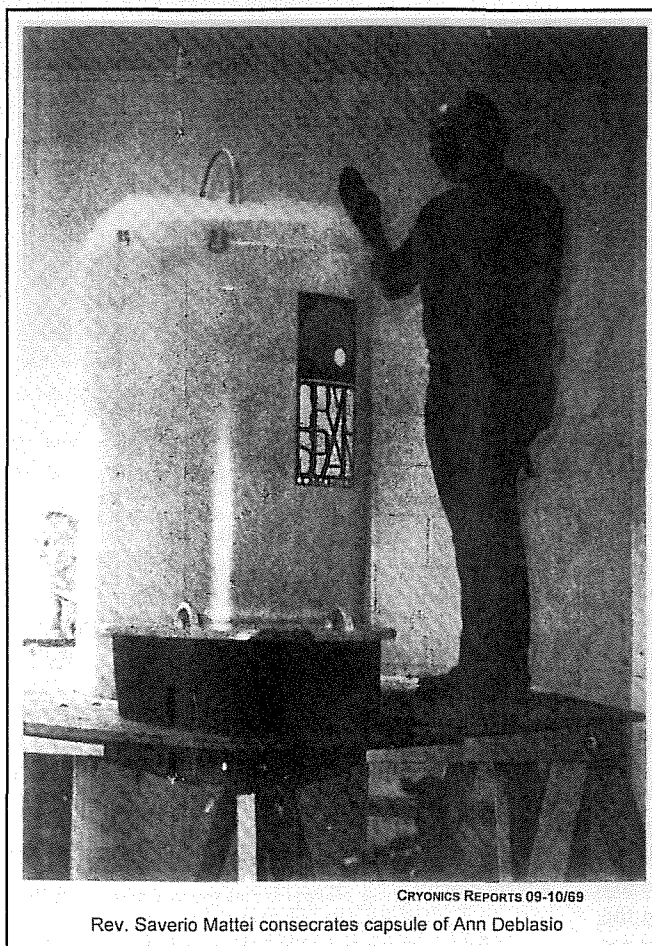
Let's again move forward, this time to the 1960s, when cryonics got its start. Early it was recognized that cryonics and religion had some common ground, and writers from both camps addressed the issues with sympathy and enthusiasm.

The Reverend Kay M. Glaesner, of St. John's Evangelical Lutheran Church in Springfield, Ohio, played an important role in what was almost the first cryonic suspension, in May 1965. (Unfortunately, the pressure of certain relatives aborted the freezing.) Later Reverend Glaesner became a spokesman for the harmonious interaction of science and religion. In an address to a 1968 cryonics conference, he offered several major headings under which religion and science can be seen as "inter-related and complementary": (1) brotherhood of man; (2) spiritual existence, (3) nature of God, (4) affirmation of life, and (5) ultimate purpose. Both religion and science, in particular, "recognize that life has the possibility of *infinite span*." One can then ask, "At what point does life cease? Is clinical death the point at which man ceases?" There are differences between the scientific viewpoint, which "sees man in the role of a cyborg kept alive by cybernetic devices" and the theological which "sees man in the role of even a greater entity — a living being embodied in a spiritual existence." There is no necessary conflict, however. Glaesner's optimistic conclusion is that —

"...advancement in any area of scientific research, including the cryonic treatment of the human body or any part thereof, does not negate the sanctity of man nor the ultimate purpose of God. If we discover laws for extending life, we are only the recipients of divine revelation. Life is still spiritual and eternal. The processes that evolve this aspect of man's existence are indicative of spiritual forces uniting man and nature."<sup>4</sup>

Another theological spokesman, John Warwick Montgomery, writing in *Christianity Today*, May 1968, focuses more directly on possible "orthodox" objections to cryonics, with the opinion that these ob-

jections are unfounded, and in any case, do not seem to be strongly voiced. Among his conclusions are that cryonic suspension is not *forbidden* by the Bible, thus is acceptable, and that cryonic suspension could be a means "for extending the time of one's earthly service to Christ," a possibility the Christian must take seriously. In fact, it appears that the main objectors to cryonics among the theologically minded are not the more conservative and orthodox but certain existentialists who express dismay over extracting man from his "historical



CRYONICS REPORTS 09-10/69  
Rev. Saverio Mattei consecrates capsule of Ann Deblasio

setting" through radical life extension. This allegedly would "destroy him." Montgomery in turn would gladly have contributed toward the resuscitation of certain individuals (including non-existentialist theologians!) of the past, had the means been available, and adds, "I shudder to think what they — or the Fathers or the Reformers — would say when faced with today's secular theology." The article, however, then closes optimistically: "I'm for cryonics: the future could well gain from those in the present who have come experientially to acknowledge the Christ of scripture."<sup>5</sup>

At this point it seems worth mention-

ing that some interactions of a more direct nature have occurred between cryonics and religion. One case involved the suspension of Ann Deblasio by the Cryonics Society of New York in January 1969. The family was Catholic, and when she was transferred from dry ice to liquid nitrogen storage the following August, a priest was on hand to consecrate the capsule.<sup>6</sup>

Another interaction of a very different sort was the 1986 incorporation of a cryonics-promoting organization, the Society for Venturism (originally, the Church of Venturism), which achieved legal recognition for scientific, educational and religious purposes.<sup>7</sup>

Venturists offer services such as weddings (several have been performed), stage annual get-togethers, and have been involved in charitable activities such as fund-raising for cryonics purposes.

There is a final, wonderful article I'd now like to consider, written by the principal founding father of cryonics, Robert Ettinger. It's entitled "Cryonics and the Purpose of Life" and it appeared in *The Christian Century* in 1967.<sup>8</sup>

To an age-old question, Ettinger here offers an answer that is simple but profound: "What is the purpose of life? Answer: To discover the purpose of life." In other words, "since ultimate answers are not within view we must make do, for the foreseeable future, with uncovering and pursuing a succession of intermediate goals hereafter! Although Ettinger is "not a theologian or even a Christian," the article touches deeply on theological (and Christian) issues, more so than the other 20th-century selections I've considered. Ettinger, like his distant predecessor Origen, has a very clear perception of man *as a developing phenomenon*, something we cryonicists can well appreciate: "Man is *still* being created; he must *develop* into the 'image of God.' And did not Jesus say, 'Greater things than I have done, shall ye do?'"

Ettinger likens the attempt, by mere man, to fathom the depths of the universe, to a dog trying to build a bridge over the Mississippi river. The creature has neither the tools, the understanding, nor the life-span to carry it through. Whether or not a dog may dream of such a task, it is clear



WEDDING CEREMONY  
of the Society for Venturism

Master of Ceremonies will introduce the Minister.

The Minister will face the audience behind a podium for notes.

The audience will face the Minister and have an aisle between them.

Minister: [Groom] and [Bride], and [witnesses] please come forward.

Bride and Groom will stand together in front of and facing the Minister. Witnesses will be just in front of crowd or well behind the couple.

Minister:

Dear friends: we are gathered here today to witness and to sanctify the joining together of two individual lives. We are here to celebrate with [Groom] and [Bride] as they marry, and as they make a commitment to love, trust and honor each other. Marriage is something into which we enter with all seriousness of purpose, but with all joy as well, and with the knowledge that in marrying another person, we are given a great opportunity to grow and find purpose in life.

There is certainly nothing more central to our being human than our love for each other. In all of its manifest ways, love creates the best in us; it feeds us to a deeper compassion and to higher wisdom; it brings joy and helps us mitigate sorrow. It makes our lives richer.

A marriage is something two people undertake with their hopes and dreams; it is a relationship which will grow with the years. It is a chance for each individual to participate in mutual strengthening of character, and fulfillment of ambitions.

[Groom] and [Bride], today you stand here before us, surrounded by friends and family, by the people who love and care for you. But you also stand apart from all others; for you stand at that threshold which will change your life forever.

Marriage is a delicate and vigorous balance between being an individual and being a couple. All of the individual elements of our lives are captured and blended in marriage, elements which seek balance and harmony and eventually which leads to a stronger union. To all of you assembled here - you have chosen to share with these two in their decision. They have called upon you to witness this commitment they make and to celebrate it with them. That makes you special, but it also means that you have a purpose here. It is to be witnesses to them and their marriage, and to take vows along with them. Your vows are to support the decision they have made, to trust them as a couple, and to help make their marriage successful.

So that we all may celebrate with these two about their decision to marry, please signify your support by saying "I do".

(Audience responds "I do".)

Minister to the couple: [Groom] and [Bride], will you, at this time, express the vows you will make to each other?

Couple: Yes.

Groom (to the Bride: [Bride], I ask you to be my loving wife, to share my life for all eternity. I choose you above all others, to have and to hold, to love and to cherish, for ever and ever.

Bride (to the Groom): [Groom], I ask you to be my loving husband, to share my life for all eternity. I choose you above all others, to have and to hold, to love and to cherish, for ever and ever.

Minister: [Groom] and [Bride], what symbol do you offer in token of these vows?

Couple: This ring. (present ring)

Minister: The offering of this ring symbolizes your desire to join your lives together. Please repeat after me: I marry you and join my life with yours. (Couple both repeat the vow together.)

Minister: Since [Groom] and [Bride] have consented together in the bond of matrimony and have pledged themselves to each other in the presence of these witnesses, be it thereby acknowledged that they are husband and wife. May the love of [Groom] and [Bride] for each other, and which they feel for the rest of us, grow stronger and richer forever, and may their marriage be blessed with joy and contentment.

## Venturist wedding is "for ever and ever"

that we humans have aspirations we can never realize, so long as we remain in human form. The solution is: we must become more than human; man must evolve into superman. Ettinger, as a cryonicist, envisions that man's own deepening understanding and developing technology will be the means to this end. This, however, need not inhibit religion, either in attitude or methodology. "The Christians among us are not rebelling against God nor aspiring to equality with him (if such a thing were conceivable); they seek rather to become his more effective tools, his worthier stewards." In fact, such development may be an essential:

"Does not Christianity need supermen? Can any *but* a superman be a complete Christian? Can the highest spiritual merit be built on less than an adequate intellectual substrate? ... Great love demands great spirits. We have got to grow, and growth requires more than formulas or incantations; it requires changes in the biological structure, changes which in all probability those of our generation are not likely to experience except after freezing, storage and future revival. ..."

The article closes noting that support of cryonics by even a modest number of clergymen would be valuable. (In fact the two preceding articles were written *after* this one by just such clergymen, showing that this was no idle hope. Montgomery's essay moreover was reprinted in *Cryonics* and is now offered as part of Alcor's

promotional literature. On the other hand, more participation in cryonics by clergy and other religious people, as with others, would be constructive.)

To summarize, and offer some final thoughts: Since well before the dawn of history, man has aspired to become an immortal superman. That goal is still tantalizingly unrealized, but the present century has opened vistas beyond those of previous times, and advances in many fields are continuing at an increasing pace. Thus the fulfillment of the age-old dream is now seen as a possibility, and one that persons of today can take part in (if necessary) by being frozen at legal death and stored until future technology can resuscitate them. Although technological means are proposed, both for the elevation to superhuman status and for transporting persons of today to the time when that will be feasible, this need not conflict with either the goals, the methodology, or the beliefs of traditional religions. The major religions seek the betterment of mankind and welcome scientific means to that end. Through such means the world and our lives can be made more like they ought to be. We will complete the human phase of our existence, and move on to higher levels, all in accordance with the deep and ancient wishes that have so often been expressed and nurtured through religious experience.

## References

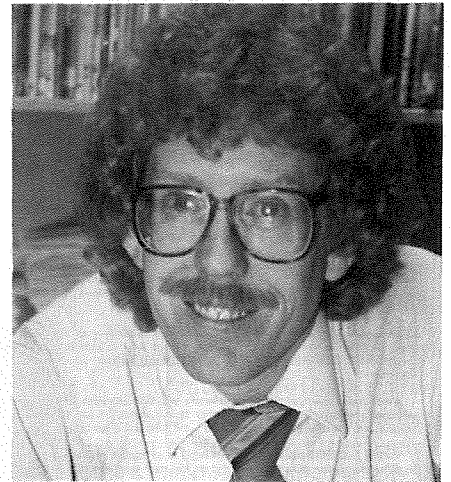
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# Cryonics and Christianity

*Cryonics* is a scientific approach to extending human life that does not violate any religious beliefs or their principles. The following answers to questions often asked about cryonics by Christians demonstrate that cryonics is compatible with Christianity, as it is with other religions, and that religious believers should feel free to make arrangements for cryonic suspension.

## Caring for the Patients

Steve Bridge



Elsewhere in this issue you will read about Alcor's latest cryonic suspension. An Alcor transport team waited at a hospital for four days until the Suspension Member was pronounced dead. (Because of our conviction that "dead" is the wrong word to use for someone whose heart has only stopped for a few minutes, we normally say that the patient "deanimated.") The Transport Team members began cooling the patient, providing cardiopulmonary support, and injecting medications, and then moved the patient to a site where they could completely replace the patient's blood with an organ preservation solution.

The patient was driven to Riverside, where the Suspension Team (which included some members of the Transport Team) replaced the organ preservation solution with a cryoprotective solution to reduce freezing damage. Over the next several days, the patient's head (he had chosen the option of neurosuspension) was cooled to -196C and finally placed into permanent liquid nitrogen storage with the other neuropatients.

End of story.

Well, end of article, maybe; but far from the end of the story. Like the sixteen other neuropatients and ten whole body patients, this new patient must receive on-going care for decades (centuries?) until the technology is developed to repair and resuscitate him. That care consists of not only keeping the patient dewars (the technical name for the tanks we use) filled with liquid nitrogen (LN<sub>2</sub>), but also many other maintenance and administrative tasks.

We don't spend much time talking about Patient Care in this magazine, per-

haps because it is a more passive activity than doing suspensions, making investments, performing research, and giving talks and interviews. Doing suspensions requires an especially large amount of adrenaline and action, so they are more exciting to do and to write about.

But it doesn't do any good to rescue patients, perform surgery and perfusion, and place them into liquid nitrogen if we can't *keep them there*. Ongoing care for suspension patients is the Number One element of our purpose in being cryonicists. Those are our friends and relatives in the Patient Storage Bay. We hang their pictures on the walls of our offices. They are real to us, and we don't think of them as "dead," any more than you would think of a patient in the Intensive Care Unit of a hospital as "dead." We call them "patients," not "bodies." We care *for* them and we care *about* them.

So once in a while, it is good for us to remind you of what we do for the patients. Contrary to numerous jokes about cryonics "power failures," no electricity is required to keep our patients in suspension. Patients are immersed in liquid nitrogen to automatically maintain a temperature of -196C (-320F). We use LN<sub>2</sub> because it is cold enough to prevent chemical activity, it is inexpensive relative to other cryogenic liquids, it is comparatively easy to handle, and it is non-flammable and non-toxic (nitrogen makes up approximately 78% of the air we breathe). Since -196C is nitrogen's *boiling point*, the liquid is constantly evaporating. We cannot seal the dewars, because the pressure would build up. So we periodically add more nitrogen.

Currently, patients are stored in two

types of dewars. Both types are made of two shells of stainless steel with a vacuum in-between to prevent heat transfer. Whole body patients are placed in custom-made nine-foot-tall units called Bigfoots, so called because of their large wheels. Each Bigfoot holds four whole-body patients. The patients are wrapped in one or two sleeping bags, strapped into protective aluminum pods, and stored vertically, head down. The patients' heads are covered with the same aluminum containers used for neuropatients, to provide extra LN<sub>2</sub> around the head if a patient needs to be transferred to another dewar. We store "head down" because if there is a vacuum failure or other emergency which causes loss of nitrogen, we want the head protected for as long as possible — for what we hope are obvious reasons. (My brain is certainly more important than my toes — especially to me.) Currently Alcor owns four Bigfoot dewars, two filled with the four-patient maximum, one half-filled (two patients), and one empty. Another Bigfoot is on order.

Neuropatients are stored in standard commercial dewars about forty inches tall. Each Neuro unit can hold nine patients. The neuropatients are wrapped in layers of dacron wool padding and placed in aluminum containers about ten inches tall, which are then arranged in the bottom of the dewar. Each dewar in turn sits in a reinforced concrete vault (the same thing used to protect gas lines under streets) to give protection from earthquake and fire. The vaults are on wheeled carts which could be moved if necessary, although they are tied securely to floor-bolts for safety. We now own two of these units,

one filled with nine patients and one with eight patients. Finding space for another Neuro unit will be difficult.

Neuropatients could also be kept in Bigfoot dewars, either a large number (perhaps as many as 54) in one dewar limited to neuropatients, or five in the center well of a Bigfoot containing four whole-body patients. The Bigfoot dewars are not in concrete vaults because production-line vaults do not come in that size, and special construction would be very expensive.

Someone is in the Alcor building twenty-four hours a day, every day. Our Patient Caretaker is Michael Perry (Ph.D. in Computer Science). Mike's job is to do whatever is necessary to keep those patients in suspension, and he takes it very seriously. Each patient dewar has temperature sensors inside, attached to an alarm system, and every day Mike records the temperature in each unit and checks to see if the alarm is working. He rechecks the alarm system before going to bed each night (he lives in the Alcor facility).

Based on several years of experience, Mike daily records the estimated level of liquid nitrogen in each tank. Approximate-

ly once a week he adds liquid nitrogen. The Bigfoot dewars have an insulated fill line attached to their sides so that nitrogen may be pumped in safely and easily, without removal of the lids. Two liquid-level sensors in each Bigfoot eliminate the need for Mike to measure the liquid levels by hand (although he and Hugh Hixon occasionally check anyway, as a back-up).

The concrete vaults surrounding the neuropatient dewars don't allow for an attached fill line. When filling those two dewars, Mike must remove the steel vault hatch lid, then remove the dewar lid, and run a fill line to the dewar. He physically measures and records liquid levels before and after filling.

Based on our cost of approximately 38 cents per liter for liquid nitrogen (counting delivery and other charges), our liquid nitrogen expenses paid during 1992 were almost twice what we thought we should have paid, according to our estimate of evaporation from the patient dewars. This appears to mean that we are losing as much nitrogen in liquid transfers and in the delivery units sitting around during the week as we are in evaporation from the patient dewars. Mike Perry and

Hugh Hixon are currently engaged in a project to determine where those additional losses are coming from and to evolve ways to trim them.

The staff member who does the second largest amount of work in patient care is Hugh Hixon. Hugh is our Building Manager, Facility Engineer, Biochemist, and Mr. Fix-it. When technical improvements are made in the Patient Care area, Hugh is frequently responsible for the idea or the design, and almost always responsible for carrying them out. Hugh designed and manufactures the aluminum pods for the whole-body patients, and is responsible for effecting the transfer of the patient from the cool-down process to permanent LN<sub>2</sub> storage. When this transfer involves a whole-body patient, it is a major exercise in logistics, often requiring as many as six or seven assistants.

The rest of the staff participates very little in direct patient care, although the administration of Alcor necessarily includes a lot of attention to the patients. Joe Hovey, our bookkeeper and Information Systems Manager, doesn't just keep records for the Operating Fund and Research Fund; he keeps track of all Patient

## Patient Care Trust Fund Policy

I. Fund capital and income shall be spent only for direct patient care expenses. Direct patient care expenses are defined as cryogenics, purchase and amortization of storage equipment, storage equipment maintenance, floor space charges, a fraction of emergency responsibility charges, routine patient transfers, and legal expenses which may be required to defend the continued care of the patients and/or maintain the integrity of the Patient Care Trust Fund.

II. Actual patient care expenses are to be calculated quarterly by the treasurer and reported to the Board of Directors.

III. The Officers of Alcor will submit a comprehensive semi-annual projection of direct patient care expenses and contingencies.

IV. The Board of Directors of Alcor is committed to meeting the expenses of patient care for the indefinite future. To this end, the Board appoints an Investment Committee which shall consist of at least three (3) persons, all Alcor Suspension Members — none of whom shall serve as Officers of Alcor. The Investment Committee shall have authority to manage the assets of the Fund subject to the following restrictions and limitations:

1. An amount of capital equal to fifty times (50X) the

amounts of annual projected patient care expenses will be held in interest-bearing investments which carry negligible risk to the principal. All surplus income shall be similarly re-invested.

2. Where there exist capital sums in excess of the amount described above, they may be invested in small risk income-producing securities or moderate risk capital growth investments up to a maximum of 20% of the total Fund with no single invested amount being greater than the 5% of the total Fund. Any income or gain from these investments is to be added capital.

3. Investments in real property or useful commodities will only be made if a financial analysis demonstrates that the resulting decrease in projected expenses is greater than the income being generated by the principal to be used.

4. An analysis of Patient Care Trust Fund investments and income will be made quarterly by the investment committee and presented to the Board of Directors.

V. Invasion of Fund capital at any time or for any reason will require a two-thirds vote of the Board of Directors.

VI. Any changes, additions or deletions to the policies contained herein will require a two-thirds vote of the Board of Directors.

Care income and expenses, too. The reason for projects like Alcor's recent certified Audit are as much for the benefit of the patients in suspension as for anyone else. The Patient Care Trust Fund (PCTF) is where the largest amount of money is placed. As President, I have many tasks which affect Patient Care, especially the many legal and financial questions connected with Alcor. In one sense, just keeping Alcor *functioning* as an organization is a primary part of Patient Care.

One other major cost of Patient Care which we *haven't* had this year has been the expense of legal actions to keep patients in suspension and to establish the legality of cryonics. We have never charged the PCTF for legal defense in the past (several hundred thousand dollars), although it certainly has been an expense of Patient Care.

A bit more about the Patient Care

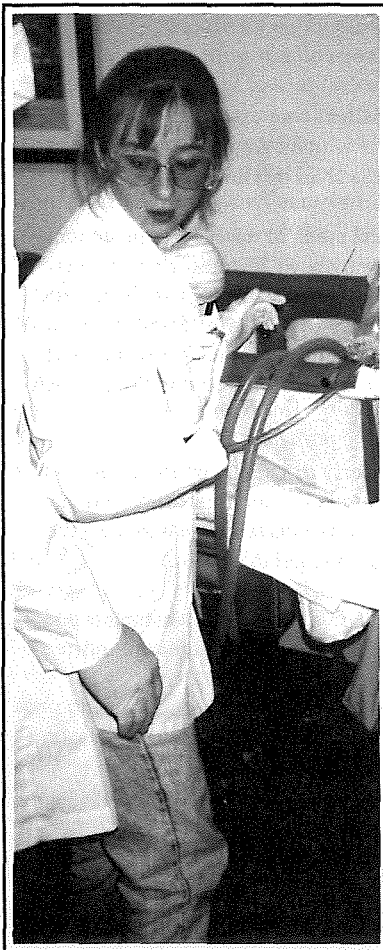
Trust Fund: Because of its nonprofit status, Alcor cannot keep separate suspension accounts for each patient. All Patient Care payments are pooled in one large fund, so that the interest generated can keep patients in suspension indefinitely, without cutting into the principal. Under the current policy, for a Whole Body Suspension we place \$85,438 into the PCTF; for a Neuropatient, \$15,076 is invested. These numbers, and hence our minimum Suspension Funding requirements, are based on "The Cost of Cryonics," an article by Mike Darwin which appeared in the August, 1990 issue of *Cryonics* and which is reproduced in Alcor's handbook, *Cryonics: Reaching for Tomorrow* (CRFT).

Mike Riskin, Alcor's Internal Auditor and Ombudsman, recently showed us that we needed to re-evaluate those figures in the light of experiences of the past three

years. Among other problems, it appears that the PCTF's income is just barely running ahead of its expenses (see Alcor's Financial Statements in the May issue of *Cryonics*). It is possible that there will be changes in the Patient Care Trust Fund policy (see box) after the Board fully evaluates these numbers. We hope to publish the results of our inquiry in next month's issue.

If Patient Care really *is* our number one priority — and who can deny it? — then we must continually review all aspects of that activity. It isn't glamorous, but it has an impact on every other action Alcor takes. This extends to the need for a larger and safer building (in terms of earthquake protection) outside of Riverside and probably outside of Southern California.

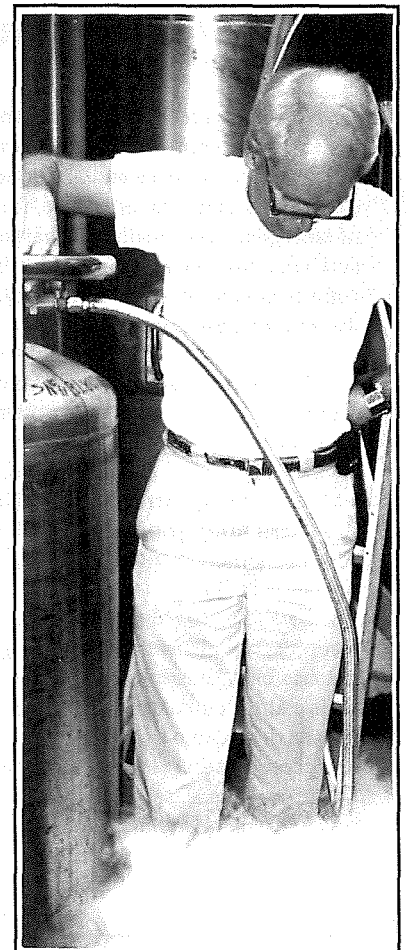
## A Special Note of Recognition



The highly successful cryonic suspension of Alcor member A-1399 — reported on elsewhere in this issue — can be directly attributed to the efforts and commitment of two people: Tanya Jones and Hugh Hixon. While the assistance of all of the Alcor staff and several members/volunteers was invaluable, the overall organization and coordination was under the constant management of Tanya and Hugh, who impressed all present with their leadership and equanimity.

Tanya has been working for Alcor for only a couple of years, but the level of organization and preparation that she has brought to the team in her capacity as Suspension Team Leader was clearly evidenced by the *lack of surprises* and all-time-low stress level associated with this suspension. Hugh, who has been working for Alcor full-time for approximately ten years, was invaluable in his capacities as chemist, engineer, mechanic, and washout expert.

This suspension simply could not have happened without Tanya and Hugh. President Steve Bridge, Vice President Ralph Whelan, and the entire Alcor Board of Directors wish to express their heartfelt gratitude and appreciation to Tanya and Hugh, the heart of Alcor's Suspension Team.





# Membership Growth

Derek Ryan, Membership Administrator

Brent Schieding, a 16-year-old high school sophomore from Connecticut, is a pioneer among pioneers.

You might not notice this about him at first glance. He doesn't look much different than his peers — no pioneer-type prostheses protruding anywhere. Neither does he seem to act much differently. He goes to school every day, finds himself more interested some days than others, plays hockey after school, has a part time job at a local grocery store, wonders when he'll finally get a car, thinks about girls, and wonders whether he ought to wear the same weird clothes in the same weird ways as everyone around him. In short, he's a 1990s American teenager struggling to find independence, self-esteem, and happiness in an environment which fosters conformity, self-doubt, and despair.

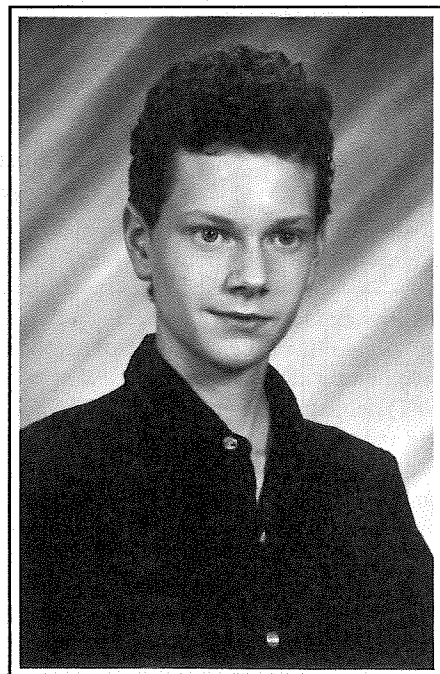
But if you talk to Brent, you'll find out that there's at least one thing which is very different about him. Out of all the high school students in America, a few thousand have contacted Alcor for information over the last decade. Of these few thousand, most decide that cryonics is very interesting, and a few even resolve to sign up some day. Of these few, Brent is the *first* to decide not only that cryonics is interesting, not only that he wants to sign up, but also that *he would do whatever it takes to sign up immediately* — without the input or assistance of either of his parents. (Of course, since he is a minor, his parents' signatures will be required on his legal documents.) He is signing up with Alcor to be cryonically suspended in case of legal death, the first unemancipated minor to do so independently in at least the last ten years.

Possibly you are already asking yourself why someone as young and healthy as Brent, "who has his whole life ahead of him," would be spending time thinking about cryonics, and more to the point,

*death.* Good question.

Very simply, Brent thinks about a *lot* of things that most teenagers — or even adults for that matter — don't spend much time thinking about, like how certain/uncertain the future is, and whether there are any guarantees in life. "I have my *whole life* ahead of me? What if I don't? Physical death is not the end of existence? What if it is? What if death really is The End?"

Be careful not to form the wrong conclusion about Brent, though. He is not *dark*. On the contrary, he's a fun-loving guy with a great sense of humor. But he is contemplative, and this lets him spend time dwelling on questions that don't seem to have any easy answers, questions



about life, death, existence, meaning and purpose. To most cryonicists, these topics are very familiar. To others, they may be unfamiliar, or even. . . *uncomfortable*.

And that is exactly the way Brent was

feeling earlier this year, before he had heard of Alcor. He was beginning to understand, however vaguely, an important difference between him and most of the rest of his peers: that he isn't as willing to accept overly-simplistic answers to truly hard questions. This is not to say that he was sure *he* had better answers, just that the answers everyone else was giving him were not satisfying him. As is probably inevitable for human beings in this intellectual state, Brent became quite depressed, with no real hope of relief. But then, in his words. . .

"It came to me in a dream."

Cryonics, that is. To be fair, he did preface this statement with, "I know this is gonna sound kind of weird, so don't take it the wrong way. . . ." Explaining further, he made it clear that although he doesn't usually find his dreams spilling over into his daytime desires, the appearance of cryonics in his dream left him with a notion so compelling that he absolutely had to find out more. So, the day after having the dream, he found himself all but running to his school library and excitedly searching for *anything* about cryonics.

To his dismay, there wasn't much. No books on cryonics, and just a few articles scattered here and there, none of which looked very promising. However, after hunting down the articles listed for magazines available in his library, he finally hit gold. At the very end of an small, one-page article from the February '92 issue of *Omni* magazine entitled "Explorations: Confessions of a Cryonicist," he found the words: "*To obtain more detailed information on cryonics, call Alcor at (800) 367-2228.*"

He soon discovered that he had not just hit gold, but that he had hit *the mother lode*.

He knew even before receiving his

preliminary info pack from Alcor that he wanted suspension membership for himself. He figured that getting his parents to allow him to do so would just require a little time to convince them that 1) he hadn't gone completely crazy and, 2) he really was serious about this. As it turned out, only number 2 was necessary. (They still aren't sure about number 1, but he doesn't mind, and they just want him to be happy.)

Since then, he has entered the sign-up process, and is now nearly finished getting everything arranged. He isn't depressed anymore, and it wouldn't be stretching the truth to say that he feels ecstatic when he thinks about the turn his life has just taken.

It's not that he has everything figured out, or that he has all of the answers he's been looking for. It's just that he has *confidence* now: confidence that the currently unanswerable questions facing him and all of mankind will eventually be answered, confidence that he can have a personal involvement in answering them, and most importantly, confidence that, when he finds the answers, no matter how long that might take, *he can be around to reap the benefits.*

Alcor's members and staff of past and present have gone to a great deal of trouble paving the way for this sort of thing. The result of that effort, as Brent clearly demonstrates, is that we are now entering the New Era of cryonics; an era in which cryonics is discussed more and more frequently in the media, in homes, in offices, and in *classrooms*; an era in which detailed information about cryonics is only a toll-free phone call away; an era in which the difficulty of making suspension arrangements has been greatly abated; an era in which Brent Schieding, high school student, never having heard of the Alcor Foundation, can readily find out about cryonics *and* Alcor, and (not quite so easily, but easily enough) *get the protection of cryonic suspension membership if he wants it.*

How long will it be until the thousands of others like Brent are beating down our doors demanding application packages? Time will tell. But before there could be many, there had to be at least one.

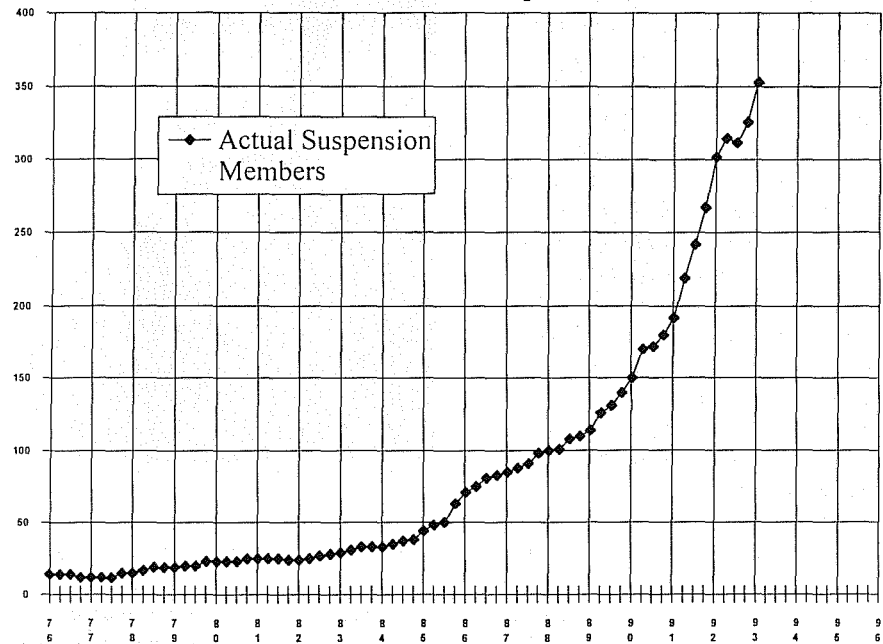
Congratulations and welcome aboard, Brent. You're officially a pioneer. I just hope you aren't the only one of your kind for too long.

## How Many Are We?

Alcor has 353 Suspension Members, 501 Associate Members (includes 127 people in the process of becoming Suspension Members), and 27 members in suspension. These numbers are broken down by country below.

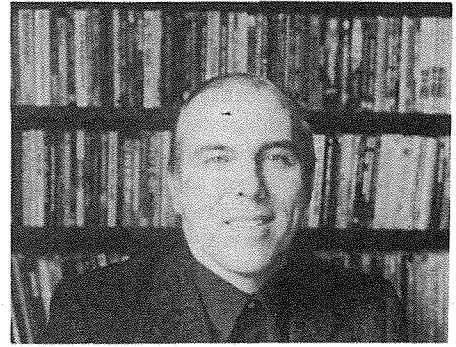
Country	Members	Applicants	Subscribers
Andorra	0	0	1
Argentina	0	1	1
Australia	13	0	4
Austria	1	0	1
Brazil	0	0	1
Canada	10	5	31
Costa Rica	0	0	1
Estonia	0	0	1
Finland	0	0	1
France	0	0	3
Germany	2	0	2
Holland	0	1	1
Italy	0	2	2
Japan	2	0	0
Lichtenstein	0	0	1
Lithuania	0	0	2
Russia	0	0	1
Spain	6	2	0
Sri Lanka	0	0	1
Sweden	0	0	2
U.K.	13	3	9
U.S.A.	306	114	308

Total Alcor Suspension Members  
Linear Graph



## The Implications of Revival

H. Keith Henson



Returning a cryonic suspension patient to the animate state seems to require a very fine-grained repair technology. It may not require *all* the capabilities of mature nanotechnology to recover our patients, but it would surprise me if our patients were brought back before that era. I would like to provide a short explanation of nanotechnology for new readers. *Word of warning:* The technical and social changes nanotechnology implies are so radical that it takes years of exposure to the concepts before most people became comfortable with them.

The conceptual key to nanotechnology is the replicating assembler, a microscopic, complex device which can be programmed to build almost anything, including copies of itself, that can be built out of atoms. In spite of this development being decades into the future, the complexity, size, and speed of replicating assemblers can be estimated from physical law and information theory considerations. Natural replicators — bacteria — are well studied. Such microorganisms can double in about 20 minutes in ideal conditions such as those found in industrial vats. Design studies indicate that assemblers will be about the same order of magnitude in size, complexity, and doubling time as natural replicators. [For a comprehensive introduction to the concept of the molecular assembler, and nanotechnology in general, check out *Engines of Creation* by K. Eric Drexler at your local library, or order it through Alcor for \$10.95. — Ed.]

Design and fabrication are both bottlenecks in developing replicating assemblers and other nanotechnology tools. Molecular simulation tools stretch the capabilities of current generation computers, but Ralph Merkle (Alcor member and nanotechnology researcher at Xerox PARC) has produced video tapes of simu-

lated bearings and gears. Fabrication tools which may be useful in this realm include a number of variations on the scanning tunneling microscope (which generates all those pictures of atoms) and self assembly (which is the way life does it).

How long it will take is subject to a lot of speculation, but I expect two to five decades to bracket the emergence of this technology. When we figure out how to make and control replicating assemblers, the base of our "industrial capital" (which roughly translates to wealth) will depend on something that replicates in 20 minutes. Planning, design, transportation, and such human factors will slow down the pace, but even a factor of 10,000 slower would leave us with more than a doubling of the industrial base per year. Currently the industrial base in the developed world doubles in about 20 years.

Human populations have minimum doubling times of about 15 years. The ratio between population and industrial growth rates equals the increasing (or decreasing) wealth per capita.

With replicating assemblers, wealth per capita for all societies will rapidly increase if we can harness even a small portion of the nanotechnology potential. (This assumes that the human populations are not using replicators to copy or make people!) A capital base doubling on a time scale of a year or less will make us almost arbitrarily wealthy, at least until we run into hard-to-define resource limits. Nanotechnology offers an opportunity for widespread personal wealth on a scale that can only be compared to today's gross world product (GWP). I leave it as an exercise for the reader to calculate the number of doublings their personal worth, or even their pocket change, would need to reach one GWP — something in the range of \$100 trillion/year.

Such a vast increase in wealth is hard to imagine, but it can be argued to have already happened. Science fiction writer Vernor Vinge has noted that ordinary individuals of today in some ways have more wealth than a thirteenth-century nation state. Isabella I had to hock the crown jewels to cross the Atlantic, something most of us can afford to do *without* credit. For a more recent example, the computer on which I wrote this article (not the most powerful I could afford) is *far* more powerful than the ones the government of the United States could afford in the late '40s. The change in the technology base allows me personally to make computations well beyond the scope of the largest national government a few decades ago — or to frivolously use it for games.

Nanotechnology wealth will be accompanied by much more fundamental changes. Cleaning up of all pollution made to date, for example, or even restoring much of the world to "pristine" conditions would be a trivial exercise. But the mind-boggling world views flow from the fact that our new tools will be well suited to changing *ourselves*.

Cell-repair machines, an obvious product of replicating assemblers, could keep us healthy by killing bacteria and stitching together cuts. Even better, they could heal damage right down to the molecular level. They could clean out clogged blood vessels, avert cancer cells by inspecting DNA for errors, reverse the effects of aging, and rebuild damage from stray cosmic rays. (This development line for living people leads to the capacity to repair the cryonics patients.) The avant-garde are not likely to be satisfied with maintaining a youthful physique, and will make modifications, like growing new teeth out of diamond.

The more profound changes, though,

will come with improved thinking abilities. I already have a list of improvements I want, starting with improved memory and an enhanced math/science/engineering "thinking aid" that would let me design a starship in an afternoon (and build it in a few months). The general availability of such things can be expected to split the race into those who don't want to change (and freeze their society like the Amish), and those who know how pitifully limited their abilities are and want improvements.

I expect some significant fraction of the human race to use nanotechnology to move into hardware where thinking and social interaction goes on a million times faster (the runaway consequences of trying to keep up with all of net news or the scientific literature). Such a society might well "collapse" into 600 foot spheres to minimize speed-of-light communication delays.

For those who want to stay in the "real" world, nanotechnological capabilities and vast wealth will permit the few

of us who want to go into space to do so on our own resources. There is plenty of material and energy out there if (as I expect) only a small number of people are willing to go off planet. Getting around the solar system would be trivial, and with arbitrarily long lives, the stars are within our reach.

Next column, I will consider how we might occupy ourselves for a million years or so.

## Deathist Meme-of-the-Month

Discovered by Ralph Whelan

We all feel that occasional wave of horror when — reading happily through a book or magazine, or perhaps watching the news — we are presented with a statement that is pure anathema to any notions of life, growth, and freedom. The horror is amplified when the source is a documentary or scientific journal, and the potential damage is squared and cubed if the horrific "meme" (an idea that *competes* for brain space) is a well-packaged soundbyte.

I was inspired to create the "Deathist Meme-of-the-Month" (with the hopes that it will become a recurring feature) by an article I came across in a recent issue of *Nature*. I of course realize that by repeating and disseminating the following quotes, I am acting as a kind of intellectual disease vector. My intention, though, is to serve as a vector for *innoculative* doses of these potential thought tumors. By seeing them out of their authoritative context (the pages of *Nature*), and in an humorous setting, they can bolster the Cognitive Immune System.

Benno Muller-Hill, a "molecular geneticist," authored "The Shadow of Genetic Injustice," which appeared in the April 8 *Nature*. The thrust of his article was that the impending all-revealingness of the Human Genome Project may catch us unaware if we do not *right now* begin agitating for legislation to prohibit the use of genetic information to discriminate against the "genetically disadvantaged." That is (and he states this notion exactly, though not in so many words), I should not

be *allowed* to prove to a potential employer that I will not be dead of Parkinson's Disease in five years by showing him my genome, because that would "unfairly" disadvantage those who will.

The entire piece is frightening, but there are three gems:

"It is not enough simply that the right of privacy is acknowledged. If those who have this right have no education, health insurance or jobs, the right is not enough. Laws are necessary to protect the genetically disadvantaged. Social justice has to recompense genetic injustice."

On a more subtle — but somehow, to

me, more scary — note, he adds:

"At the extremes, people will have to chose [sic] between the values of the Nazis and those of Moses — that is, racism or an appreciation of equal human rights."

By "equal human rights," we can only assume that Muller-Hill means "the right of all humans to *appear* equal to everyone else, no matter what the reality is."

And then, for the real kicker, Muller-Hill quotes a sentence from *Science and the Future*, by J.B.S. Haldane:

"I think that the tendency of applied science is to magnify injustices until they become too intolerable to be borne, and the average man whom all the prophets and poets could not move, turns at last and extinguishes the evil at its source."

The logical conclusion of this very common line of thinking is of course to *remove* all benefits of applied science from our society (pardon me, "*extinguish the evil* of applied science... near the middle of the food chain.

### Addition to My Dewar Nameplate

By Steve Harris

I'm told, ten billion years ago, that all  
My atoms burned in stars; then exiled long  
To space and cold, returned at last in thrall  
To narrow solar climes where life may spawn.  
I hear, a million years ago, the cries  
Of rage; my fathers burned their hands with flame,  
Yet feared more outer night and all its eyes  
And found at last the middle safe domain.  
I knew, a hundred years ago, the sear  
Of lust that never lasts; but all its cease  
Meant not that I could live outside your sphere,  
And back I crept to you for light and peace.  
And now, cold ash of living's fiery pace,  
Again I 'wait your warmth, my middle place.



# The Suspension of A-1399

## On the Road Again...

Tanya L. Jones

Easter Sunday (April 11th), a day usually associated with the death and resurrection of a prominent religious figure, saw the deanimation of Alcor member A-1399, a man who may now have one of the better chances at "resurrection" of the cryonics patient population. The suspension of "Edward Davis" was significant for more than one reason: it was Alcor's first suspension in over eight months to require stand-by, transport, and cryoprotective perfusion; it was our first ever without the skills of either Jerry Leaf or Michael Darwin; and it was our first opportunity to test an unproven emergency response capability, and an equally unproven Suspension Team Leader.

It's difficult for me to find a place to begin. Part of my initial speechlessness stems from my desire to accurately convey the events of this suspension and its four day stand-by in conjunction with the emotions that prevailed, everything from the constant nervousness of inexperience and indecision, to the quiet swell of triumph felt when we realized that we'd done it, *despite* our insecurities.

To begin at the beginning, Edward called Alcor for information a year ago. After receiving our information, Edward followed up his call with a heartfelt letter which thanked us for simply existing and doing business. His letter was accompanied by a completed application, the sign-up initiation fee and the sad news that Edward had AIDS and lymphoma and suspected that he would be needing our services relatively soon. Doctors gave him 24 months, best case. Nine months, worst. Splitting the difference, Edward's suspension occurred just thirteen months after his diagnosis.

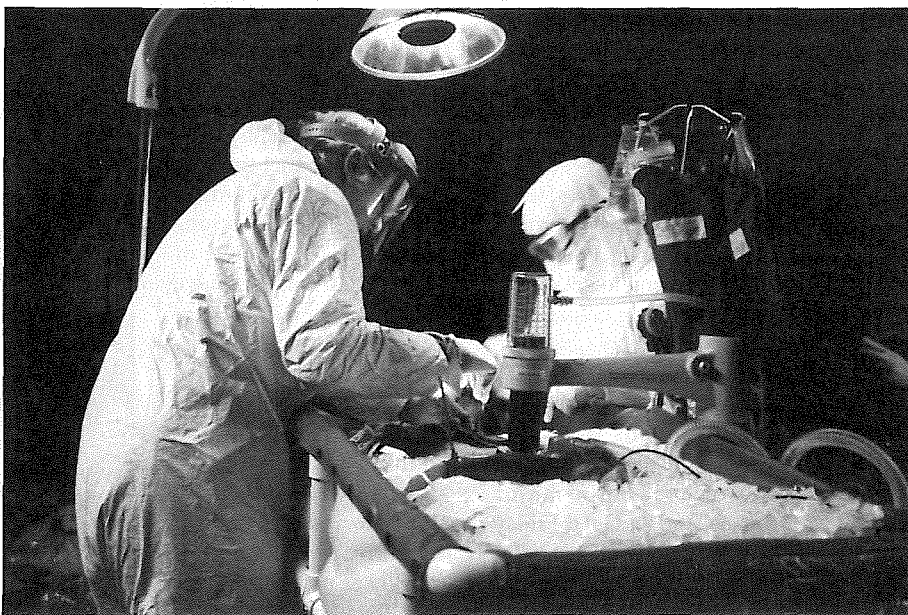
We had received sporadic reports from Edward during the progression of his illness. In December, he'd spoken with his oncologist about his cryonics arrangements, and his oncologist was willing to help ensure that things proceeded smoothly. Little did we know the scope of this

doctor's "help." When we arrived at the hospital in response to Edward's calls, we were surprised to find that the oncologist had already discussed Edward's case with the hospital administrators, *and* had provided them with erroneous information about Alcor's procedures and requirements. It is conceivable that this misinformation was a contributing factor to the ultimate level of cooperation we received from the hospital. Some of the statements attributed to the oncologist would have made me nervous, too. (S/He told them that because Edward was a neurosuspension patient, we would have to remove his head before we left the hospital.)

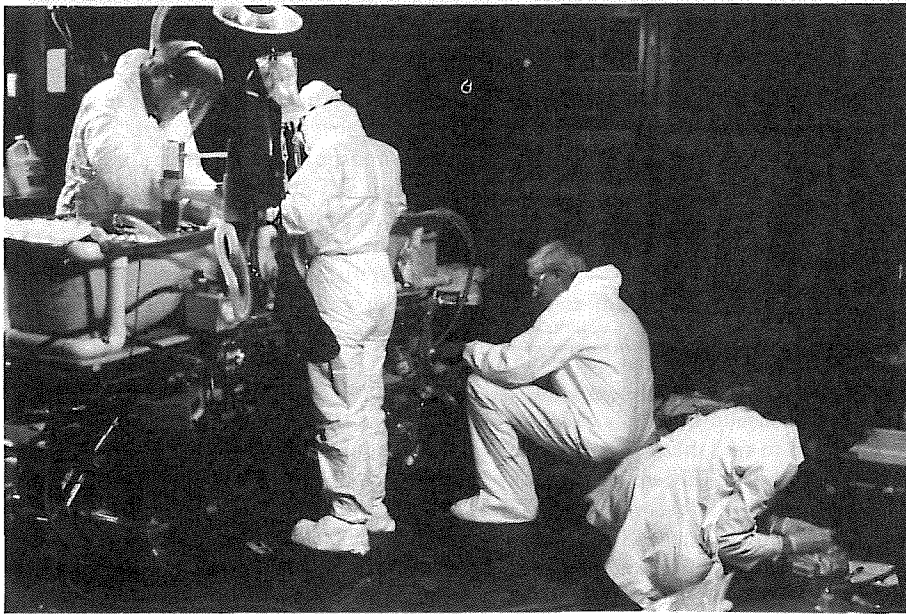
We were aware that Edward had entered the hospital for treatment during the first week of April, and that he wasn't optimistic about his chances. Earlier this year, Keith Henson and Naomi Reynolds, of the Northern California Transport Team, had spent some time at Edward's condominium, discussing the logistics of performing a transport from his second-

story apartment. Although the logistics were less than ideal, we were willing to work around the nasty staircase, but emphasized that carrying an 800-pound gurney up and down a narrow flight of stairs with a patient inside was a very risky maneuver for the patient, our equipment, *and* the team members.

Our concerns about the staircase at his condominium turned out to be unnecessary, as Edward later decided to remain in the hospital. He felt that remaining at home under the care of a hospice service would be too much of a hardship on his family. Edward was being cared for by his lover and several friends. His brother had flown in from the East Coast, and his sister was due in a few days. During the time following his admission to the hospital, we received several calls from Edward's brother, "Charles." Charles asked numerous questions about cryonics, stating that he wasn't interested for himself, but that he wanted to ensure that his brother was going to get the best possible cryonic



Keith arrives to assist with the surgery.



All hands occupied: Naomi's with preparing the washout solution. Hugh's with setting up the perfusion circuit. And the surgery also progressing.

suspension available.

Unfortunately, Charles had to return home on April 8th. Edward wasn't left without family however, since his sister "Anne" had arrived a couple of days earlier, and she wouldn't be leaving. She echoed Charles' attitude with respect to cryonics and her brother's impending suspension. Anne is a critical care nurse, so we were very happy to have her constantly watching over her brother's condition. Her expertise in dealing with critically ill patients afforded us some reassurance that Edward's condition wouldn't deteriorate without Alcor hearing about it. Based on Anne's assessment that Edward probably wouldn't last through the next night (April 8th), the ambulance was deployed on the evening of April 7th. Scant hours before the sun was due to rise, Hugh, Steve Bridge, and I arrived at a much appreciated resting point after a long, dark drive: Keith Henson's home. We stayed long enough to catch a few hours sleep and a shower, and to get an update on the patient's condition before continuing on to the hospital.

Our arrival at the hospital wasn't particularly well-timed, as far as making administrative arrangements were concerned; we arrived in the early afternoon of the Thursday preceding a major religious holiday weekend — Good Friday and Easter Sunday, to be more specific. Administrators like to take holidays off. Arriving on Thursday afternoon left us with little time to locate and interact with the people making the decisions regarding

this impending cryonic suspension.

When we arrived at the hospital and began interfacing with the staff, our first contact was with Anne and a hospital social worker, who had no real authority, but who knew some of the right people. The social worker introduced us to the head nurse. Steve Bridge and I then sat down with Anne, the social worker, and the head nurse to explain our procedures and to establish a common ground for determining the level of cooperation we were going to receive from the hospital. Our requests were *relayed* (one example of on-duty personnel tracking down critical off-duty personnel for decision-making) to the Director of Administration. While we were engaged in these conversations, it was looking unlikely that Edward would survive the night, according to the hospital staff and Anne. Because of this, we were well-motivated to resolve the administrative issues as quickly as possible.

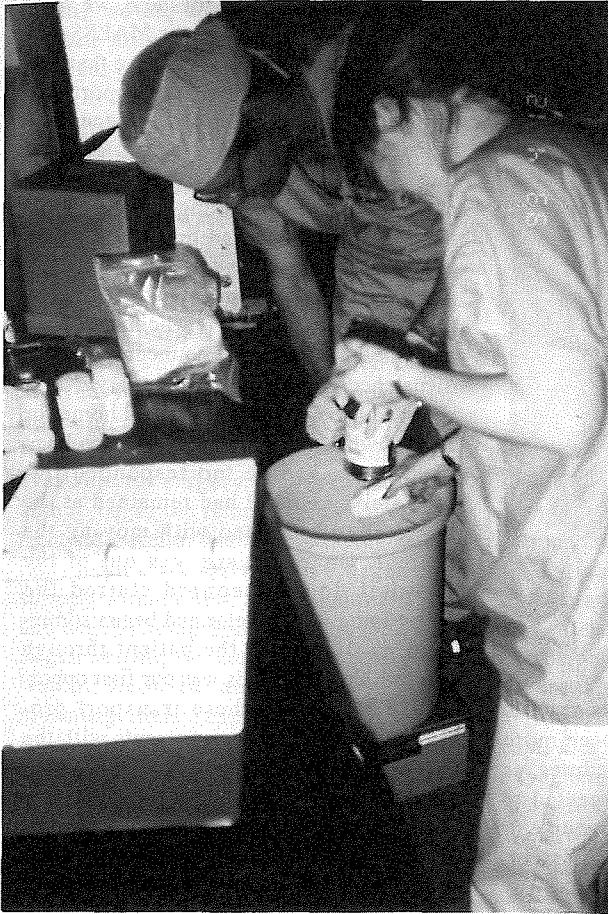
The head nurse returned with the verdict: Hospital policy dictated

that we were not authorized to do anything to the patient on the premises. No CPR, no medications, nothing. Further meetings, later that day and the next, proved fruitless. A concession we were able to get was that our special "gurney" could be brought into the hospital and stored across from the patient's room. With that, we brought in the Mobile Advanced Life Support System (MALSS) and several coolers full of ice and placed them in a room directly opposite Edward's. By bringing the ice into the hospital, we were *technically* defying the hospital's policy; however, none of the hospital staff challenged our ice, and we didn't quite get around to bringing it up ourselves. Our team, now consisting of Naomi Reynolds, Keith Henson, Leonard Zubkoff, Joe Tennant, Hugh Hixon, Steve Bridge, and myself, set up shop in a lounge down the hall and began our wait.

Finding a place to park the ambulance was a challenge, as the hospital was located between streets filled with parking meters and numerous tow-away zones. A nearby paint supply store allowed us to put the ambulance in their parking lot until we completed the suspension. Still, that was



Applications are currently being accepted for roles in "Alcor: The Movie."



**Brewing bourbon?  
No, just a cryoprotectant cocktail.**

only the ambulance, and the team members accumulated several hours of driving time by simply moving their cars between various tow-away zones.

While we were attempting to arrange things with the hospital, Naomi was working on another complication. The mortuary with which we'd contracted for prep room space and removal services had fourteen steps leading down to their prep room. No elevator and no ramp. As with the stairs at Edward's condo, we were reluctant to commit ourselves to any logistics which would require carrying an 800-pound MALSS (with patient) up and down any flights of stairs.

Our dilemma was resolved when we discovered that the mortuary had a garage. Hugh and Steve had driven to the mortuary to discuss the transport preparations with the mortician when they noticed the garage and asked if the mortician would lease garage space instead of the prep room. He would and did, and he even reduced the rental charges. After all, it was a *garage* that we were renting. Edward Davis became the second Alcor patient whose washout was performed in a garage-

turned-field-operating-room. (Patient A-1260 was the first.)

On the night of April 8th, Edward was placed on oxygen as a comfort measure to augment the morphine he'd been receiving. He was exhibiting many agonal signs (including air-hunger), and Anne expressed the opinion that Edward's death might occur within hours. The hospital requirements demanded that we have a state-licensed mortician sign the regulatory transfer and transport documents, despite Alcor's (as an organization) legal authorization to execute this paperwork in order to receive and transport our patients. To minimize the time it would take us to clear the hospital bureaucracy after pronouncement, we contracted with the mortician to sit the stand-by with us. At 3:30 am on April 9th, the mortician was called in to join in the wait. Naturally, his

arrival was the impetus Edward needed to hang on.

That day (Friday), Steve continued to lobby for better cooperation from the hospital. He and I later met with an ad-

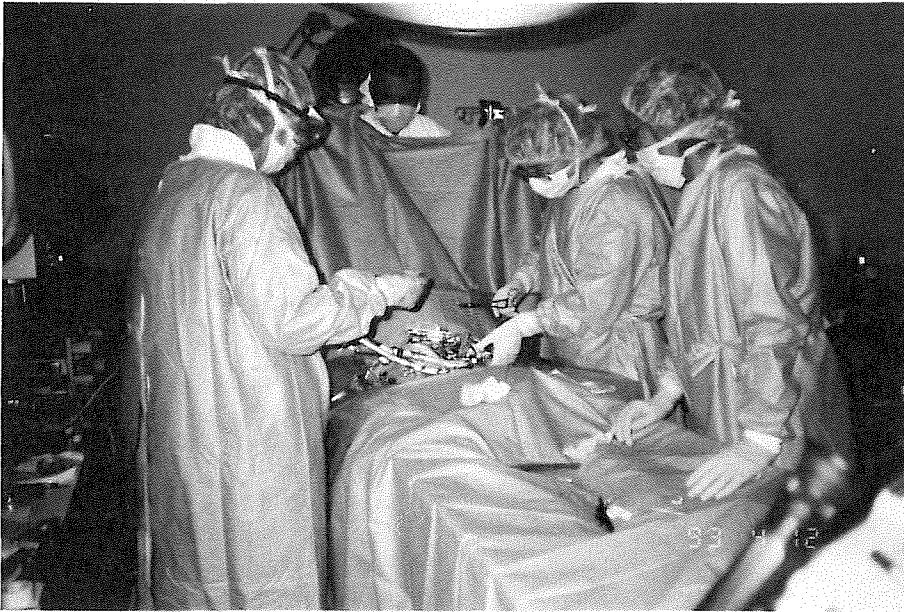
ministrative assistant and provided her with copies of our standard legal documents, and copies of the California injunction which states that Alcor has the right to put a pronounced patient on the heart-lung resuscitator (HLR) *in the hospital*. Not even this judgment was sufficient to sway the Director of Administration, to whom copies were relayed, and neither was the assurance of written, comprehensive releases of liability for the hospital and its staff. The administrator stood her shaky ground of "hospital policy," and it was up to Steve and myself to decide whether legal intervention was prudent in this situation. Although the staff members with whom we were dealing were courteous, they were very closed-mouthed, which complicated the situation. They refused to supply us with the names of the hospital's legal council, or give us direct access to the administrator who was reportedly making all of the decisions.

Steve discussed the matter with other Board members, including Carlos Mondragon, who has extensive experience in dealing with hospital bureaucrats. Together they concluded that calling in the attorneys would probably compromise the suspension *more* than just abiding by the restrictions imposed by the hospital. The final, compromised list of *do's* and *don'ts*: we could keep the MALSS very near the patient; we could pack him in ice after pronouncement; our patient would receive a prompt pronouncement (within a few minutes); hospital staff would leave all lines (including an IV) in the patient; the ambulance could use the service entrance



**Dr. McEachern preparing to connect the perfusion circuitry.**





Naomi and Tanya assist Dr. McEachern with the open heart surgery. Brian Murdock observes closely.

for loading; the team could wait in a lounge on the same floor; the team members could *not* administer any medications on the hospital premises; and we were not allowed to provide cardiac support in the hospital.

By this time, Edward's condition appeared stable, so Keith located a nearby motel, and some of us went to get some rest and a shower. The mortician had been sent home even earlier. For the next 36 hours or so, Edward's condition remained stable. On Saturday (April 10th), Anne admitted to having given up predicting when pronouncement was likely to occur. Despite her nursing background, the reality of Edward's survival was consistently disproving her professional assessments of his condition. I explained to her that this resistance to death had been the case for every patient transport I've participated in. A common thread in cryonicists appears to be stubbornness in hanging on to life. Some of the nurses had even expressed the opinion that Edward could last for another week or two, in his (then) current condition. They'd seen it before: many individuals seem to exhibit strong attachment to life as it leaves them.

As we later discovered, the time we spent waiting around might have been used more productively. While I knew how the ambulance was stocked and where the supplies and equipment were located, Hugh was the only other team member who was familiar with its organization. Our time would have been well spent acquainting the team with the ambulance, the transport

procedures, and each individual's specific role. Also, Steve should have been more familiar with the transport procedures, as in my absence he would be expected to lead the team. All of this is, of course, a fine example of the clarity of hindsight. Next time, we will do better.

At 4:00pm on April 11th, Naomi and I went to get some sleep at the hotel. A few hours later, a nurse pointed out to Steve that Edward's right foot was mottled and blue. This is an indication of very poor circulation, and usually a reliable sign of impending death. At this point, Steve or Hugh should have called the motel to waken Naomi and myself. Just to reiterate, proper briefing of what danger signs to expect and under what circumstances to have the entire team assembled would have been beneficial in this case. It wasn't until I was reading Steve's typed notes from the suspension, a full three weeks after the transport, that I discovered the extent of the cyanosis which the nurse, Steve, and Hugh had observed. Had I been informed when the nurse discovered the foot, Naomi and I would have been present at pronouncement.

Naomi and I had planned to return to the hospital at 10:00pm to relieve Steve and Hugh. At 8:55pm I was about to step into the shower when my pager sounded, indicating that Edward had deanimated. (We have a pre-arranged set of codes for the pagers which indicate the nature and urgency level of any page.) Naomi and I rushed to the hospital and arrived twelve minutes after being notified of Edward's

deanimation. When we got there, we were able to transfer Edward to the MALSS and pack him in ice. At the same time that Edward was being loaded for transport, the mortician was completing the necessary transfer and transport documents. We were thus able to leave the hospital almost immediately upon completing the transfer to the MALSS. Hugh had brought the ambulance to the loading area and set the lift gate for a quick-load and departure.

Those team members who hadn't been near the hospital at pronouncement were dispatched directly to the mortuary. Keith was on his way, having returned home for a brief while. Joe Tennant had also been sent home, and he too responded immediately. Leonard had remained at the hospital and assisted with moving the patient. Once Edward was out of the hospital doors, Leonard started the Heart-Lung Resuscitator and began administering oxygen to the patient through manual-bagging. (This was our first opportunity to initiate these transport procedures, given our arrangements with the hospital.) As soon as the patient was secured inside the ambulance, I performed a tracheotomy to open a secure airway to allow for mechanically ventilating the patient with the HLR. This was the first use of this technique in a field situation, and it proved much more efficient than even my practice attempts on canines had indicated. In about thirty seconds, we had our airway. Placing any other sort of airway would have taken me, or any other team member, several minutes at least, if it could have been placed at all. Placing airways in patients is a difficult skill to master if you don't have many patients to practice on. By performing a tracheotomy, I was able to avert potentially longer ischemic episodes. The tracheotomy proved its worth in our protocol almost immediately. It's simple, effective, and *fast*.

My nervousness was evidenced when I tried to place an end-tidal CO<sub>2</sub> detector between the oxygen line and the tracheotomy tube. I could *not* make the detector fit. After the suspension, I went back and tried to connect them, and found that they fit well. Logic had told me, during the transport, that they *should* fit given their standardization, but my hands were uncooperative. I was wasting precious time, and left the detector out of the loop. In the future, I'll be sure to calm down a bit if I find that things aren't fitting.

While I was occupied with the airway, Naomi was administering the medications with Leonard's assistance, Steve was



taking notes, and Hugh was driving. Despite hilly streets which made us grab the sides of the MALSS in order to remain upright as we worked frantically, we managed to administer all of the medications (or at least begin the administration, in the case of large volume medications) and even place a rectal temperature probe. We arrived at the mortuary in what felt like no time at all, but was actually a full fourteen minutes.

Upon our arrival, we muscled the equipment which was being stored at the mortuary into position, including an operating room light we'd brought from Riverside. For once, adequate lighting was available for surgery. At 10:15pm I was able to begin the femoral cutdown on the right side. Keith, who was to be my assistant, hadn't yet arrived, so I began the surgery without him. Joe Tennant arrived and began photographing the setup. Hugh began setting up the perfusion circuit. Naomi, Leonard, and Steve were still manning their respective stations of medications, HLR/oxygen support, and documentation.

Shortly after I began the surgery, Keith arrived and began assisting. Conversation, even between Keith and myself across the top of the MALSS, was strained. When in operation, the HLR emits loud noises, which alone may successfully prevent conversation. Face shields and face masks were also not entirely conducive to the propagation of sound waves. In any case, it was very difficult to hear. We've encountered this before, however, and found the AIDS precautions (specifically, the face shields) added the benefit of a layer of personal protection far out-weighting the sound-propagation inadequacies. The femoral cutdown proceeded smoothly until it came time to place the venous cannula. When we attempted to place the cannula, we found a large clot blocking our passage. I was still able to drive the cannula through the clot and get flow, without performing a cutdown on the other side. There were no other significant developments during the surgery and the connection of the bypass circuit.

Despite the inconvenience of having to repeat every instruction or comment for the notes two or three times, Edward was on bypass one hour and ten minutes after the initial surgical incision, a time which compares favorably to the recent average of one hour and nineteen minutes to begin the bypass (times compiled from the last four transports requiring field washout).

We washed out the patient's blood and replaced it with Viaspan (an organ preservation solution). By 1:45am, we had completed the washout, secured the patient and equipment in the ambulance for the drive to Riverside, and tidied up the garage so that it was cleaner than we'd found it upon our arrival.

One complication which may have affected the perfusion involved was a result of (surprise!) bleach. Bleach has been shown to neutralize the AIDS virus within thirty seconds of undiluted exposure. As a result, we have incorporated it into our AIDS precautions. Chlorine bleach was poured into the ice bath of the MALSS, because many excretions, including blood from the surgery, flow into the bath. Unfortunately, *much* more bleach was poured into the bath than was necessary to chlorinate 5-10 gallons of water. The ice-water from the MALSS is used in the perfusion circuit to provide cooling, and the massive amount of bleach may have corroded the heat exchanger, causing it to rust. Corrosion of the heat exchanger/oxygenator might then have contaminated the patient circuitry with cooling water. We are still awaiting test results which will give us the information necessary to determine the extent of the damage (if any). Irrespective of what the test results are, this sort of damage must be prevented, and *without* compromising the health/safety precautions for the team members. In the future, the correct amount of bleach crystals will be pre-packaged.

Hugh drove the ambulance, while I monitored the patient and maintained in-

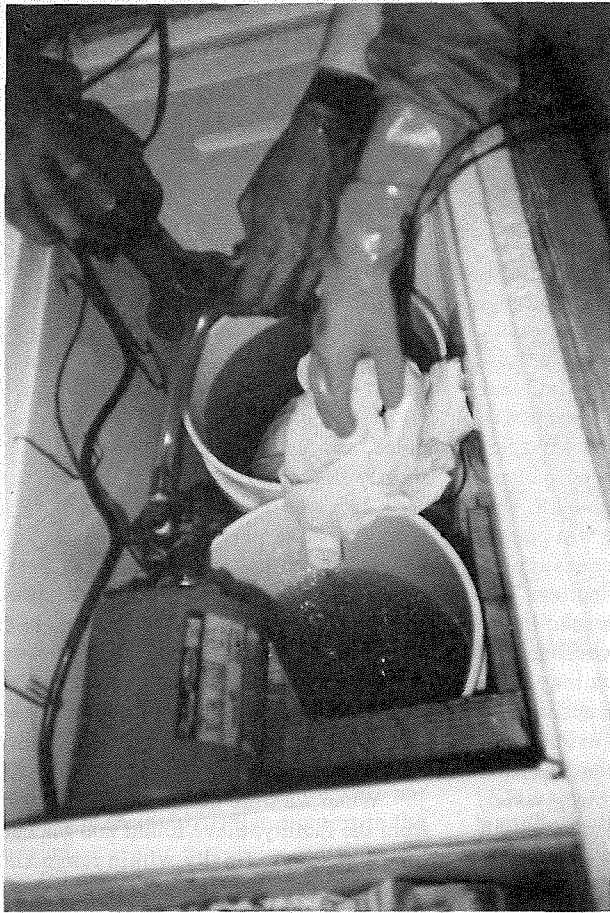
termittent low-flow perfusion for the next nine hours. Steve and Naomi drove in Steve's car as our "chase" vehicle. The other transport team members went home to recuperate, i.e., sleep.

During the drive to Riverside, we were out of contact with the lab for about seven hours of the nine hour drive. This was the result of problems with the cellular phone, which made it inoperable outside of a very limited southern California range. The phone company had neglected to activate a switch in their offices which would allow us greater range. Additionally, the batteries in my country-wide pager failed, and the replacement batteries failed shortly thereafter. Ralph Whelan, who'd been left to prepare the facility for the cryoprotective perfusion, found himself unable to contact us with his questions about some of the preparations which were beyond his experience (tasks which Hugh and I would usually perform). However, Ralph wasn't without things to do, and all of the preparations Ralph had the knowledge to address were completed before our arrival.

When we were about two hours away from the facility, Steve found that the cellular phone was finally within range and called the lab. Ralph had assembled the suspension team, and the surgeon was scheduled to arrive within an hour of the patient. Many of the pre-suspension tasks were done, and there were just a few tasks (like mixing the perfusate) that remained. (Based on recent recommendations made by Dr. Steve Harris and Mike Darwin about some unexpected physiological



Double-checking the connections and flow patterns before beginning the cryoprotective perfusion.



A closer look at the new automated neuro-cooler.

properties of sucrose, we elected to use mannitol rather than sucrose as the osmotic agent for this cryoprotective perfusion.) Ralph had used my standard operating procedures and checklists while preparing the facility, and in some cases, was able to determine that certain sections of these procedures must be re-written for clarity.

Recently certified team members participated in their first cryonic suspension. Brian Murdock, Regina Pancake, and Jay Skeer (the three new technicians) joined Derek Ryan, Trudy Pizer, Nancy McEachern, Mike Perry, Thomas Munson, and Bill Seidel for the suspension. Everyone, except Trudy and Nancy, was already at the facility when we arrived with the patient. Brian sat in the ambulance and monitored the patient during the final preparations. He maintained the perfusion cycle that had been implemented in Northern California, while awaiting the transfer of the patient inside for the open-heart surgery. With the able assistance of the remaining volunteers and staff, the open-heart surgery was begun within a few hours of our arrival.

Dr. McEachern began the surgery,

with me assisting and Naomi handing off instruments, while maintaining the order of the surgical trays. Ralph was the perfusionist, and he'd drafted Jay to assist him. Regina took notes; Bill videotaped the proceedings. Once the surgery began, Trudy, Derek, and Brian circulated throughout the operating room, completing any non-sterile tasks that scrubbed-in surgical personnel needed done. Mike Perry ran the computer program which would provide us with projected efficacy and cryoprotectant administration information about the perfusion.

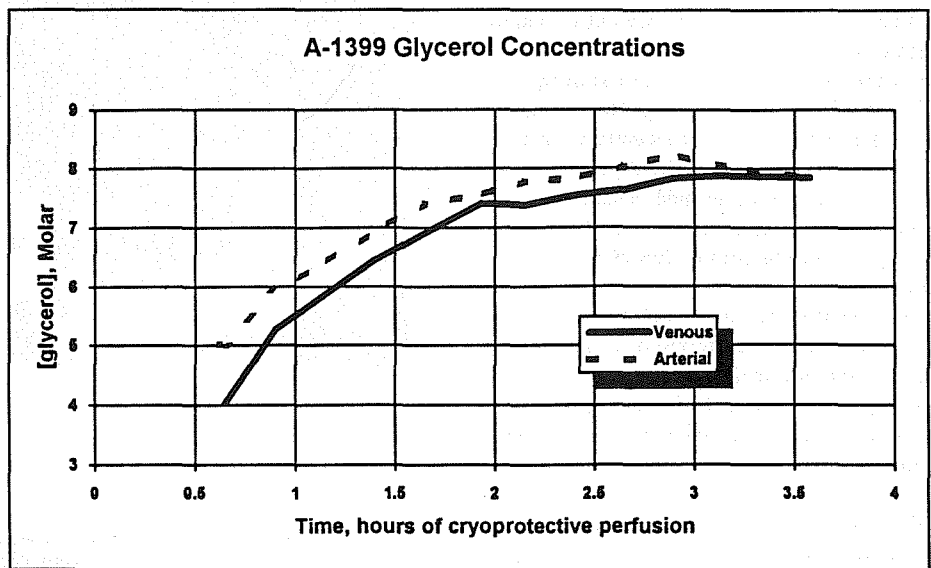
During the surgery, a few significant things happened. For the first time ever, we tied off the pulmonary artery, taking the lungs out of the perfusion loop, and thereby creating a more efficient circuit. Also, Edward had a paper-thin right auricle, which made placing the purse-string sutures required for cannulation difficult, but we were careful, and placing the sutures was uneventful. At 4:51pm, we began the cryoprotective perfusion. A few minutes later, we stopped the perfusion, upon finding that the clamp on the descending aorta was no longer in position, for reasons which still are unclear. Lucki-

ly, we had tied the descending aorta with suture (in addition to clamping it) and were able to stop the leakage quickly and restore the clamp.

Hugh had prepared a burr hole, through which we were able to view the brain for signs of edema. What we saw was heartening: The brain not only receded from the opening (a good sign of cryoprotectants removing water from the system and causing shrinkage), it receded more than in any other patient I've ever seen — nearly 25 millimeters by the end of the perfusion!

As we neared a molar concentration of glycerol equivalent to the previous best case (Jim Glennie, 6.0M), we began to get nervous about the potential toxicity of higher glycerol concentration levels. When I called a cryobiologist for advice, I received better news than I had expected. He was momentarily astounded at our achievement of these glycerol concentrations and was elated at our potential for even higher concentrations! During this conversation, the cryobiologist not only confirmed the efficacy of the perfusion (based on his pioneering work in the field of vitrification), but even encouraged us to take the glycerol concentration *as high as it would go*. He indicated that toxicity damage was outweighed by the benefits of the cellular protection resulting from higher concentrations. This encouragement to aim for the moon was later amended somewhat, and we were advised to stop at 8.0 Molar levels, just in case. We achieved equilibrated venous and arterial concentrations equal to 7.9M, which calculates to only 14% of the water in the brain being converted to ice! A record!

We took samples of the spinal cord



for later analysis, with the expectation that they will give us a better idea of how well the brain perfused. These samples will be good indicators, as nerves typically perfuse poorly, when compared to other organs. If we are able to determine the glycerol concentration in the spinal column, we will know that the brain reached that concentration or better.

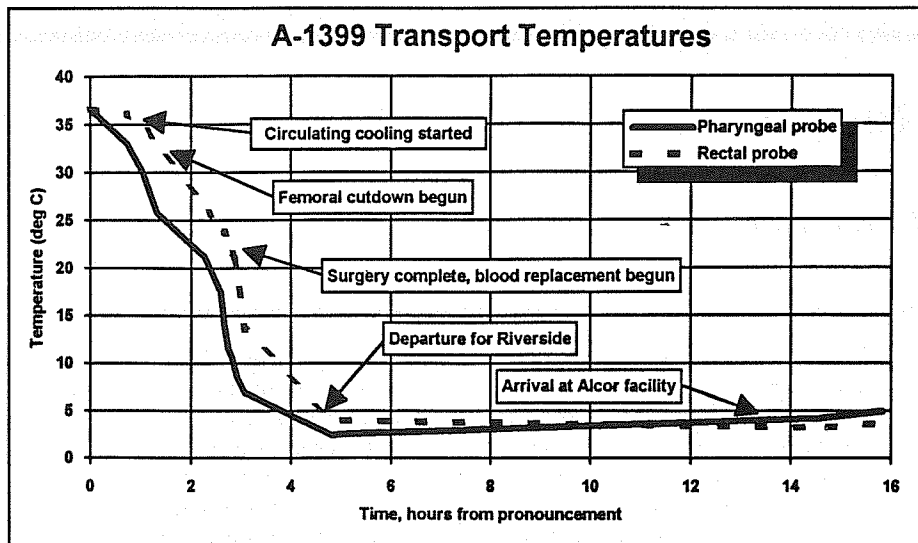
The subsequent cephalic isolation and cooling proceeded without incident, and we were able to test the new automated cool-down and data-collection system developed and implemented by Scott Herman, Hugh Hixon, Keith Henson, and Mike Perry. It performed admirably, and for once, the only cool-down tasks that Mike had to do were monitoring the system for failure and adding dry ice at appropriate intervals. Cooling to liquid nitrogen temperature and placement into permanent storage were completed by April 25th.

One of the tasks involved in a cryonic suspension which rarely has been publicly addressed is the cleaning of the facility, *after* the cryoprotective perfusion. This generally has been done by exhausted team members who want little more than to go home and sleep for a few weeks. When these tired individuals must perform the thousand-and-one tasks which are necessary to restore the suspension capability, we risk something critical being overlooked. Again with this suspension, the exhausted Transport and Suspension Team Members were called upon to clean up. We hope to address this by lining up a fresh and rested "clean-up team" to take over, next time.

In the past, it has taken as long as a week to fully re-establish our suspension capability. Far too long! That interval has already been reduced with overstocking the ambulance and remote kits with consumables (like medications), however, on a limited budget, there are restrictions on how much we can afford in providing redundancy. Still, many of the preparations can be done by volunteers, and in the future, volunteers will be solicited for this less-glorious aspect of cryonics.

Returning to the specific suspension at hand, Edward Davis was perfused to nearly the glycerol concentrations required for complete vitrification (9.3M). Achieving these levels in the future is well within our capabilities.

With this suspension, Alcor's cryonic suspension capability has been clearly demonstrated. In some respects, it has even been shown to be improved beyond



previous levels. During this suspension, the atmosphere in the field and in the operating room was much less stressful than for any other I've experienced. This *doesn't* indicate inattentiveness, it indicates a reduction in the performance-limiting pressures. And there was an increase in the development of mutual cooperation, respect, and self-confidence, on both individual and group levels. The team *is* inexperienced, with some exceptions; however, that inexperience is not hindering the process of performing and improving the quality of cryonic suspensions for Alcor members. Improvements to the suspension procedures, as the result of the imperfections evidenced by this case, are well underway.

This suspension was not perfect. However, the deficiencies are specific and *reparable*: we need more technicians familiar with the layout of the ambulance; we need further redundancy in *all* positions, far beyond the little we have now; we must solicit volunteers to assist with the post-suspension recovery period; we

must adhere to our infectious disease protocol more stringently. The good news is that primary improvements now lie in the direction of training, acquiring more knowledgeable personnel, and improving the mechanics and physiologic understanding of a cryoprotective perfusion. Much of this training requires on-going exposure to cryonic suspensions and cannot be obtained except through trials-by-fire. However, having a team with the confidence to succeed and the desire to do what is best for the patient is an excellent start. The rest will come.

I wish to thank everyone who participated in this suspension. Your assistance, enthusiasm, and confidence was (and is) inspiring: Stephen Bridge, Keith Henson, Hugh Hixon, Dr. Nancy McEachern, Dr. Thomas Munson, Brian Murdock, Regina Pancake, Dr. Michael Perry, Trudy Pizer, Naomi Reynolds, Derek Ryan, Bill Seidel, Jay Skeer, Joe Tennant, Ralph Whelan, and Leonard Zubkoff. And come the next suspension: expect a call.

### The "Staff Salary Supplement Fund" Still Exists!

Last year, under the impetus of Alcor Director and Treasurer David Pizer, we created the Staff Salary Supplement Fund to help alleviate the financial woes of the Alcor employees. Thanks to several contributors, the year of 1992 was significantly less of a hardship for the seven full-time staffers who keep Alcor ticking.

So far *this* year there have been very few contributions to this Fund, but of course the cost of living and the strain of surviving on the meager Alcor wages is being felt more than ever. The Alcor staffers still average only \$13,000 a year in salary *before taxes*. Any amount that you can contribute to the Staff Salary Supplement Fund will represent a significant improvement in the standard of living for these folks, and will increase the likelihood that they will be able to *afford* to keep their jobs. Please consider sending a check or calling with a credit card donation to help support the staff.

# Revival

Fiction by David Krieger

The world seems made of pain. There is a tube down my throat, connected to a machine that is puffing me up like a balloon every few seconds — *hiss*, pause, *huff*, pause, *hiss*, pause, *huff*, pause — but it still feels like I'm suffocating. My chest is a searing ache that ebbs and flows with the air being pumped in and out of me. There are voices, talking over me, sometimes talking to me, but I can't answer them, even if I didn't have this thing in my mouth, because all of my attention is trapped by my own bloodstream, screaming to my brain that I'm not getting enough air.

"Can he hear us?" Jeannie sounds miserable and scared. I wish I could speak to her. I would nod, but moving my neck, with the tube in, is too painful.

"I don't think so, Mrs. Corey. His condition is very serious. The infection isn't responding to the antibiotics. Even though the respirator is giving him almost pure oxygen, his blood is becoming more and more acidic, which means his lungs aren't transferring enough of the oxygen to his bloodstream. They're filling with fluid."

"Isn't there any more you can do?"

"I'm sorry."

The words pass by me without any meaning. I blink my eyes, but they're painfully dry.

"That machine isn't doing him any good, is it?"

"At the moment, it is giving him some oxygen. However, unless the antibiotics begin to work, it soon won't be helping him at all. I expect that he'll go into an irreversible coma soon."

"You know Duane's wishes when it reaches that point, Doctor."

"Yes, Mrs. Corey, and I'm willing to abide by them. Is your transport team standing by?"

"Yes." Jeannie calls to someone outside the Intensive Care Unit. "Ken? Would you come here please?" A shadow moves across the light. "Ken, this is Dr. Jackson. Dr. Jackson, this is Ken Phelan, of Alcor."

"How do you do, Doctor." I feel a

hand on my arm, and Ken's voice is closer. "Duane, can you hear me? Give me a squeeze if you can." There's a hand in mine; I squeeze it as hard as I can, but I'm not sure if it works. I try to nod, but the tube feels like a branding iron in my throat. "We're here and we're ready, buddy. Don't worry, everything's going to be okay."

I nod again, though the whole room seems to be moving farther and farther away. Even the ache in my chest seems to be growing less and less distinct. I close my eyes. The voices grow indistinct and my awareness narrows to the clockwork sound of the machine that is breathing instead of me. *Hiss*. Pause. *Huff*. Pause. Then even that slips away.

I awoke to a gentle touch on my arm. I opened my eyes and saw my friend Ken Phelan. He was wearing a white lab coat. I looked around me and saw that I was in a hospital room.

"How do you feel, Duane?"

"Um, fine, I guess," I said. "I'm just a little confused... what am I doing in the hospital?"

I realized I must be sick. Ken looked very serious. He asked, "What's the last thing that you remember?"

"I — I remember going to bed. What's happened? Am I sick?"

Ken smiled. "Do you feel sick? No, you're just fine." He was right; I *was* fine. My body seemed to be humming with vitality. "I'm just testing your memory, that's all. What day was that? What date?"

I had to think for a moment. "Um, yesterday — Wednesday. Let's see, Friday was payday; that would make it the fourteenth, so Wednesday the nineteenth. Of November."

"And what did you do yesterday, Duane?"

"I — took the day off. Went for a day's drive in the mountains with Jeannie and the kids, then we went out for supper." I sat up and looked around. "Ken? If I'm fine, why the heck am I in the hospital?"

"Well, you've been sick, Duane. Now

here's one for you: Why am I here?"

I then noticed the Alcor patch on the chest of Ken's lab coat: Alcor *Resuscitation* Division.

"Ken?" I felt weak suddenly, and dropped back to the bed. "When did Alcor get a Resuscitation Division?"

Ken chuckled and settled into a chair beside the bed. This reassured me; Ken sure didn't seem worried. "Why don't you tell me, Duane?" He crossed his legs and laced his fingers around his knee, smiling. "It's not just your memory I'm testing."

I swallowed; my mouth was dry suddenly. "Wow. Um, well I guess I was suspended. Is that right? Was I?" Ken nodded. My head spun with questions... Jeannie, the kids... I tried to stay calm and think. "I must have died in my sleep sometime Wednesday night. Um, wait, not necessarily. Short-term memory takes a few days to get consolidated into long-term. So I died within a few days after Wednesday. Correct so far?"

Ken continued smiling and nodding. I went on, "You're testing my memory to see how well I came through suspension and resuscitation. And you're testing my reasoning ability for the same reason, right?"

Ken smiled a little wider and nodded a little more emphatically. "Right so far. What year is it?"

I sat up and looked around the room. "No way to tell from my surroundings; this looks like a typical hospital room from 1997. It's probably a reconstruction to protect me from future shock." Ken didn't contradict me.

"Well, nanotech must be working by now, or I wouldn't be here. Ralph Merkle predicts — um, used to predict, I guess — that the first working assemblers would be constructed by around 2015. My own personal estimate is more like 2025. From there to cryonic resuscitation, would be, I guess, at least ten years. So it's at least 2035. It could be a lot longer, depending on historical circumstances."

"And what kind of world is outside that door?" Ken asked.

"Well, the kind of world in which people are going to revive suspension patients. Civilization still exists; humanity possesses advanced molecular-scale technology; cryonic resuscitation is legal, or at least, if it isn't, the prohibition isn't strictly enforced. Alcor is still functioning, if that patch on your lab coat is current, or some descendant organization has replaced



it. And I haven't been revived to serve as transplant fodder or a slave."

Ken laughed. "How do you know that?"

"Come on, Ken, we've talked about all this before. If you have a technology that can repair the freezing damage done by cryonic suspension, it would be easier and simpler to just make replacement organs from scratch. Similarly, if you want slaves, it's a hell of a lot cheaper and easier to breed them from scratch than to go reviving cryonauts."

Ken nodded and made encouraging noises. "Go on."

"Hmm. Well, you're working for Alcor, so your knowledge must be up-to-date, so *you* probably haven't been cryonically suspended. Since you're still around and looking good — haven't aged a day since 1997, I'd say — then we've also got effective anti-aging therapies that not only keep people alive, but young.

"Since staying young and healthy seems to be allowed, I'd have to guess there's no population problem. That means either rigidly-enforced population control or space development. Since suspensees are being revived, I assume there's no program of population control, ergo we've expanded into space. That means no poverty."

"Ten out of ten so far," Ken said.

"The individual must still be valued," I continued excitedly. "You don't go lengthening lifespans or reviving suspensees in a collectivist or totalitarian society, because they're based on the premise that human beings are basically interchangeable units. Why extend anyone's life, or bring back someone from suspension, when there's another generation of drones ready to take their place? So totalitarianism hasn't made a comeback — at least not here in America anyway."

"Sure you're in America?"

I frowned. "Toss me your pen." Ken threw it to me — or rather, he threw it toward a point to my left, and it curved toward me in flight. "Aha. Coriolis force. We're in a space habitat, rotating to provide simulated gravity. And you've been living here a while, because you compensated perfectly for it in your throw."

Ken shrugged. "Or maybe I just learn fast."

I was growing excited and curious. Why were we in space, for example? "Okay, so fill me in! What's happened? How did I get suspended?"

Ken consulted a clipboard. "Well, on Thursday the eighteenth of November, 1997 —"

I interrupted. "That clipboard is a prop, right? We've got brain interfaces by now, don't we?"

"They're in the works." Ken grinned and turned the clipboard around. The writing surface looked just like several sheets of paper, and then Ken removed one; it was a sheet of paper. He crumpled it and tossed it to the floor. "Okay, now watch." He wrote my name and a question mark into a box at the top of the next sheet, and in the next instant the rest of the page filled in with text and charts. He touched the tip of his pencil to a box in the corner of the page, and the contents of the page scrolled up and down like a computer display — but it looked exactly like ink on paper... in full color, to boot. He took that sheet off the clipboard and handed it to me.

On Thursday, November 18, 1997, I came down with pneumonia. I remember having a bit of a cough on Wednesday. I didn't go to the doctor until Friday, unfortunately, thinking it was only a bit of a cold, and by then it was too late, the pneumonia being one of the fiercely drug-resistant strains common in the late '90s. I was pronounced legally dead in the early hours of Saturday morning and was suspended soon thereafter.

I handed the paper back to Ken. There were questions I was afraid to ask just yet, so instead I asked, "The paper is a computer display?"

"The paper is a computer," Ken answered. "A sheet of paper is about 150,000 nanometers thick. This single sheet contains more computing power than the entire city of Chicago did in 1997, and it dissipates very little heat. The paper communicates in the infrared with the walls of the room, and accepts appropriate acoustic input from any source; when it's on the clipboard, there's also a megahertz acoustic interface with the clipboard."

"Acoustic. Does that mean — ?"

"Yes, it accepts voice input. Erase this sheet," he said, and the paper went blank. "Now show me the Mona Lisa." A print of the famous painting materialized on the page. "Fourteen hundred dots per inch, in 24-bit color. Tiny regions of the surface actually change color." He handed me a sheet.

"Um. Show me a photograph of the Earth from space." The image materialized; in the foreground there was some cylindrical structure, with green inside. "Wow. I'm impressed!"

"I'm *still* impressed," Ken said. "I love this stuff."

"Can I crumple it up? Can I fold it?"

"Crumple, no. That piece on the floor is dead. But you can fold or tear it in halves or thirds — it's designed for that." He tore a sheet in half. He now had two smaller Mona Lisas. "The computing machinery inside is multiply redundant; one sheet comes apart into up to sixteen pieces, and each piece is still fully functional."

"You said the clipboard's a computer too? Must be a pretty powerful one."

"This clipboard is my life. Remember that electronic organizer I used to carry around in the 1990s? Now I've got seventeen of these, networked, and I take one wherever I go. They're not all clipboards, of course; one is my desk at home, one is in the hood of my spacesuit. One is in my left scapula... with a conveniently-located display." He pushed back his sleeve to the elbow and showed me his left forearm. I thought I was supposed to be looking at a wristwatch, until I saw once again the text and images from my medical chart, now scrolling along skin of his forearm, underneath the hairs, still in full high-res color.

"Wow. I'll bet you never miss an appointment," I said. "Can you get real skin back on your arm if you want to?"

"Are you kidding? My skin's fine. This display just sprays on and washes off."

"How much does all this cost? The paper must be cheap — you crumpled that one up pretty nonchalantly."

Ken frowned. "In 1997 dollars? Duane, in 1997 you couldn't have bought paper like this if you owned the whole world... it just didn't exist. Today? Well, let's say in 1997 the average American made fifteen dollars an hour, and 200 sheets of paper cost you about \$1.50. So a single sheet cost you one 2000th of an hour's labor. Today, one sheet of this paper costs me about one 10,000th of an hour's labor.

"Automated molecular manufacturing has made everything inexpensive — not free, but extremely cheap. The only costs involved in making these computers are energy, materials, and design effort. Energy and materials cost what it takes to gather them up — we're mining the asteroids and we've got efficient solar power, so that cost is tiny. The only human effort involved is the design — and we've got powerful software to aid in that design. This paper was built by a molecular factory about the size of a ruler. It sits on my desk, so there aren't even transportation and packaging costs."

I couldn't distract myself any longer from the important questions I had been

dreading. "Ken... How are Jeannie and the kids?"

"Just fine, and very eager to talk to you. They've all been following the progress of your reconstruction quite closely. There's just a few more things I have to tell you, to prepare you, before you talk to them."

"Did Jeannie remarry? Is she still human?"

Ken put his hand on my arm reassuringly. "Duane, Duane, I hear the sounds of future shock coming from you. Relax, my friend. Part of my job is to protect you from future shock. We're not going to inflict the present on you any faster than you can handle it, I promise you. You won't have to deal with the really fantastic aspects of today's world until you are ready for them."

"Jeannie is still very human. And she did remarry. However, she does still love you. And, legally, she is still married to you as well. She's waiting right outside that door, and she's going to break it down in a minute or so if I don't tell her it's okay to come in."

"I don't know what's going to happen between you and her. It's sort of as if you've been lost at sea or missing in action for a long, long time, Duane. Remember, we all knew there was no guarantee anyone would ever come back. Since the first resuscitations, Jeannie's had time to deal with the possibility and to plan for it."

"What you have to remember is this, Duane: Jeannie has been alive for almost a century. She's grown and learned a lot in that time. It remains to be seen whether the two of you even have anything to talk about any more. I think you will, and I'm going to do all I can to see to it that this comes out in the best possible way for all concerned. Jeannie is going to be helping me ease you into the world, and during that time the two of you will learn how you feel about each other. You think you feel the same way about Jeannie as you did yesterday — but that yesterday was decades ago, and the Jeannie of today isn't the same Jeannie you know."

I nodded. "I understand. Jeannie and I talked about this, when we signed up. We'll work it out. Things will be okay, whatever happens."

"Okay. Good. Now, your sons are also waiting outside."

"How are they?"

"Grown men, of course. Very happy and successful. Ted supervises robot construction. Computers as complex as the human brain are common now, of course, but we haven't yet figured out how to pro-

gram them to be self-aware, so large construction and engineering projects still require human direction. Right now, Ted is building a network of undersea train tunnels joining Europe to Africa. I'm sure he'll tell you all about it."

"And Jim?"

"Jim's now a gas-mining engineer... he develops new ways to mine hydrogen and helium from Jupiter and Saturn. Nowadays he looks a lot like you do. If you think your system is up to looking at something that hideous, well..."

"Hmm, very funny. Maybe I should toughen my system up by having a look in a mirror first, huh?"

"Sure thing." I don't know if the mirror had been there on the wall the whole time, or if it wasn't revealed until I asked the question, but there it was on the wall to my right. I looked exactly like I did when I went to bed the night before, as nearly as I could tell. "Wow. Poor Jim. He didn't get my jowls, did he?"

"Well, cosmetic surgery has come a long way, you know. He actually looks quite a bit better than you ever did."

"Gee thanks. You said the boys were outside; where's Amanda?"

"Amanda couldn't make it. She's been outside the solar system for the last couple of years."

"Wow — interstellar colonist?"

"No, she's actually doing physics research. This particular experiment has to be performed in gravitationally flat space, about half a light year out, and it lasts for another two-and-a-half years. However, we've got a message from her, and you can view that with Jeannie and the boys shortly; and you can all record something to send to her."

"So... are you ready to meet your family?"

I was ready. "Yes. Bring 'em in."

Jeannie actually looked younger than she did the last time I saw her — yesterday, it felt like, but now it was starting to feel like much longer. Jim, as advertised, looked like a healthier and wiser version of myself... when he had been a gangly sixth-grader the last time I went to sleep. Ted was several inches taller than me and had even more freckles than he did as a nine-year-old. He had a big grin on his face. "Hi, Dad. How are you?"

I spread my hands, palms up. "I feel fine. You're the one who looks like he's aged thirty years overnight." That got a laugh.

Jeannie came forward and put her arms around me. "Are you okay? Are you really okay?"

I held her tightly. She was crying. "I'm fine," I said. "Really." I was crying too, and then we all were. "I guess we've got some stuff to talk about, huh?"

I shook hands with both of my sons. That was so strange; the night before, they had both been boys, and now they were both taller than me — *older* than me... they had lived more years than I had, anyway. They still looked younger than me, thanks to the same anti-aging treatments that had kept Ken in such good shape — they could pass for my younger brothers.

I talked with the boys about their work. Ted's train network was going to link Monaco, Genoa, and Pisa to the islands of Corsica, Sardinia, and Sicily, and to Tunisia, the toe of Italy, and Malta. Jim was rich, even relative to this rich new world: because of his more advanced methods, his company controlled three quarters of the market in hydrogen and helium.

After a while we played Amanda's message. I expected it to be in 3D, but Jim explained to me that it was conventional to use 2D for recorded or one-way messages, and 3D only for truly interactive communication. Amanda grew up to be a fine-looking woman as well. Her accommodations aboard her research station didn't exactly appear Spartan — there were green plants and caged birds visible in the background.

We recorded a response to send to her. Since she was half a light-year away, it would take six months for our message to reach her. When we had finished, Ken broke in. "I hate to break this up, folks, but it's really best if Duane doesn't rush things, okay? You've got plenty of time to get caught up, right?"

Ted grinned. "All the time in the world." He put his arm around my shoulders and gave me a shake... when the night before I could pick him up under one arm. "Come see me in Italy when you're ready, Dad. Bet you've never seen the Mediterranean from underneath before!"

"Can't say that I have, son."

"I'll see you tomorrow, Dad," Jim said. "I'm staying over here at Alcor."

"Me, too," said Jeannie.

"Well, there we go," Ken said, "tomorrow, then. How about for lunch? I'll be leaving about that time anyway for a dinner meeting down below, so Duane should have the afternoon free. Okay?"

Once Jeannie and the boys had gone, Ken started in on my first real history lesson. I realized that I was in for a lot of work fitting back into the world... but I had all the reasons I needed.

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# Why Am I Signed Up For Cryonics?

## A Personal View

Keith Lofstrom

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I am an unashamed believer in the power and benefits of technology. The revolutions in computers and molecular biology, while fraught with growing pains, are not likely to slow down before we achieve some variant of nanotechnology. I figure we are at the dawn of one of the most exciting periods in human history — when we will gain complete control of our lifespans, our environment, and our interactions with each other.

I figure that if I live another 50 years, I will almost certainly reach this era, and be able to participate and marvel in the changes and new ideas. On the other hand, I may not make it that far, and that is why I am signed up for cryonics. *I want to see the future, and provide a link to the past.* Cryonics increases the likelihood that this will happen.

I want to be a living witness to a child's fear of the Cuban Missile Crisis, the joy of the first Moon landing, and the elation of the first shuttle launch (which I got to watch). I will tell the engineers what it was like to watch integrated circuits grow from 8 transistors to 8 billion. (If you think that won't be exciting to future audiences, get a copy of Neville Shute's *Slide Rule*, and read how aircraft made a similar transition). I want to tell people what it was like to live in a society of socialists, homophobes, religious fanatics, meat eaters, and all the other aberrations I expect will have disappeared in 100 years. I want to tell people what it was like to dance naked in a meadow beside the 150-year-old wagon road that brought the settlers to Oregon. I even want to tell

them about hunger, and pain, and grief — these will come in new and different forms, but the old ways will still be useful to know about.

I have met thousands of people in my life; some of these people may be known to the future as great authors, scientists, or humanitarians. I am sure future historians will literally want to pick my brain to find out about these people. Some of my personal heroes may never be famous, and probably won't choose cryonics in time; my fond memories of them may be their only memorials.

In a future age of plenty, there may be a strong tendency to stasis and timidity. I figure that we "immigrants from the past" will be the ones that do the hard and dangerous jobs that our coddled descendants won't touch. Compared to the rigors of the 20th century, these jobs will seem quite easy to us. We will bring a unique vantage point to a world grown perhaps too uniform.

I may even want to try being a child again. I had a pretty lousy childhood — my mother did her best on a poverty wage, but better is still possible — and the technology will come that will allow it. If the world gets too crowded, this may be the best way to satisfy the urges of people who want to be parents, and are good at it.

With an indefinitely long lifespan, I get to try many things. I get to take the time to do things right. I get to smell flowers without my allergies, look at the world without glasses, hear and make beautiful music without my partial deafness. I am not planning on coming back old, or crippled, or

locked in a machine.

Some of my friends are also signed up — some of them will be the ones that bring me out of suspension, and I will help with the rest. There will be a lot of happy tears in the process.

Even if none of this comes to pass, and cryonics doesn't work out, it has been worth it. I used to wake up at night and stare at the ceiling in the small hours of the morning (the Germans call these the "wolf hours" — poetic and accurate). I was not worried about the pain of dying, or of being nonexistent; I was worried about being ineffectual, and not doing all I wanted to do in life, and all the foregone options involved with every hard choice I have ever made. It may simply be a comforting illusion, but since I signed up for cryonics I don't have those nights any more. I feel it is enough to do one thing well — I can do the other things later. This has increased my happiness and my productivity, more than enough to pay the few hundred dollars a year that I put into cryonics.

More sleep is good, but even better is the friends I have made. Cryonics certainly has its share of flakes, but there are some beautiful people involved, too. Courageous, caring, hard working, ambitious, thoughtful, interesting people! People who stand willing to risk jail to save my life, as I hope I would have the courage to do for them.

Friends, and community, and sharing... which is why most of us do anything, right?

# Body and Brain: A Trophic Theory of Neural Connections

by Dale Purves, Harvard University Press, 1988

Reviewed by Thomas Donaldson

This book will not tell you about your soul or explain consciousness or memory. Nor will it tell you how to revive cryonics patients, particularly the unlucky patients who suffer widespread cracking, for whatever reason. What it will do is explain the observations and thinking behind the many experiments in neurobiology which suggest that our neurons, even in adults, constantly remodel their connections. Dale Purves has done a good deal of work on this subject; he is one of those responsible for the fascinating but incomplete work on neuron remodelling which suggests (but does not prove) that our memories cannot consist solely of the interconnection pattern of our neurons, but they must also leave traces in the activation of genes in the cell nuclei of our neurons.

The observations Purves made of neurons quite literally reworking their contacts over months admit no denial (see Figure 1). At the same time, even years after he and his co-workers made them, they remain maddeningly incomplete. No one can be blamed for that incompleteness; it comes from our present lack of any way to examine single living neurons within a single animal's brain over periods of months. The neurons Purves et al showed moving weren't internal to the brain, though they were as close as they could make them. They were in the sympathetic or parasympathetic ganglia of mice, where nerves from the brain contact others connecting to the salivary glands and to muscle (see Figure 2).

Basically so far, wherever neurobiologists have been able to look, they have found evidence that neurons and their synapses to other neurons do not remain permanently fixed. They move about constantly, though only slowly in adult animals. Many other neurobiologists have done experiments on how the connections between muscle and nerve change constantly, even in adult animals. And in embryos, as the nerves form and finally contact their targets, this constant change

becomes magnified far beyond the situation in normal, uninjured adult animals.

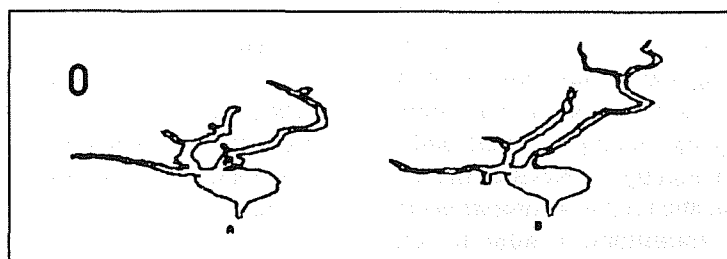
One of the main features of these movements, of course, is that the existence of a connection always remains constant. In injury, whenever the nerves grow together to repair the damage, they act as if they seek out a target to which they had already decided to aim. That is, nerves act as if their growth is guided by trophic substances. Purves details all the observations and experimental evidence that show this, both for embryonic growth and adult repair.

As yet we lack a full list of the trophic substances involved. The only one Purves discusses in detail is NGF, nerve growth factor, which has been found to influence nerve growth even in the central nervous system (it was originally thought to act only outside the brain). Several other factors have also been found to exert similar trophic influences: these include ciliary neurotropic factor (CNTF), brain-derived nerve growth factor (BDNF) and basic fibroblast growth factor (bFGF). However the evidence provided by Purves in his book makes the need for such fac-

tors very strong.

At this point I must discuss another theory of nerve growth which might be thought to compete with that of Purves. I have reviewed two of Edelman's books before; Gerald Edelman has become known for his discovery of cell adhesion factors (CAMs) and neural CAMs (NCAMs), which he has discussed as providing a key to growth in nerve cells. His discovery is both true and important: one characteristic of nerve growth that trophic substances don't explain is the fact that the nerves also tend to grow along surfaces, as if some chemical attached to those surfaces also attached to them. Yet CAMs or NCAMs cannot tell the whole story of neuron growth. In animistic terms, how does a neuron decide to follow one path rather than another?

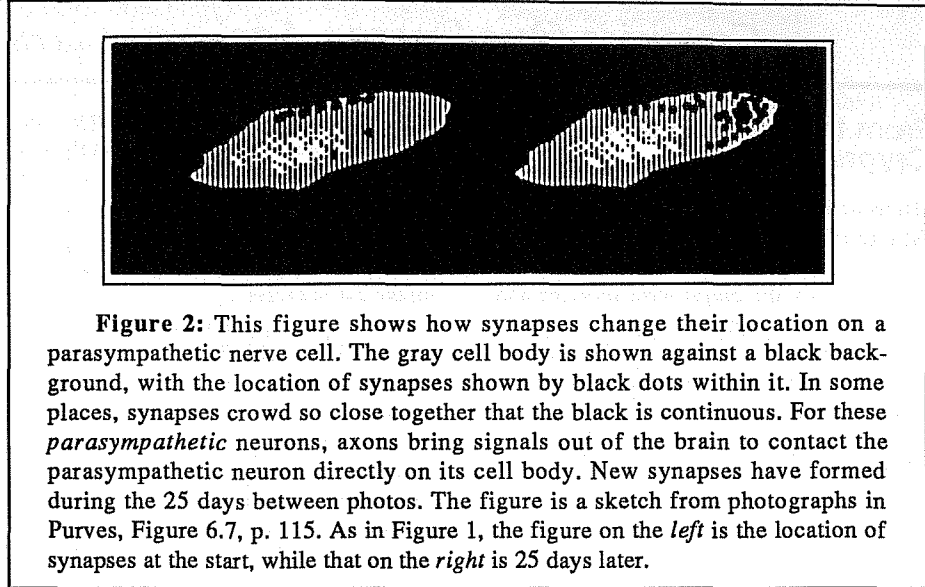
Edelman has also championed a version of neural growth based on a (kind of) Darwinian theory: as we develop, nerves compete for attachments, with the losing ones degenerating and dying. One point Purves makes against such a theory is that for cells with many dendrites this does not happen.



**Figure 1:** This figure shows the same neuron examined at the start (A, on the left) and end (B, on the right) of an 88 day period. It is copied from Purves, Figure 6.8, p. 117. The original diagram also showed the changes in 4 other neurons. The extensions are dendrites; note that besides extension of existing dendrites, new dendrites have formed and others have disappeared. The nerve cells shown lie in the *Superior Cervical Ganglion* of mice, located in the neck. A *ganglion* is a mass of nerve tissue outside the brain; there are 3 cervical (ie. neck) ganglia: superior, middle, and inferior, with the superior ganglion located closest to the skull.

The issue of slow changes in our central nervous system may be settled relatively soon without using special methods to examine nerve cells in living animals. Whenever an axon or dendrite grows toward a target, special widened structures form on its growing tip, its growth cone. As it grows, this tip behaves as if it were tasting the medium and cells that it touched, sending out short projections which it then withdraws. One way to test for continual growth in living central nervous systems, then, would involve understanding the special chemical forms and traits of these growth cones, then carefully examining fixed brain tissue for signs of such cones. In 1971 Sotelo and Palay (LAB INVEST 25(1971) 653-671) actually made such a study, but present techniques would prove or disprove the presence of growth cones far better than Sotelo and Palay could do in 1971.

This work remains very important for our understanding not just of long-term memory, but of the problems involved in recovering it from brain tissue damaged by



either (or both) freezing and ischemia. Since our current suspension methods require fast access to patients, some patients will still suffer such damage even when we find a less damaging way to suspend those

whom we can catch quickly. And this may mean *you*: think of the suspension of Jerry Leaf, delayed for hours despite his being Vice President of Alcor and local!

## The Newcomer's Guide to Social Categories in Cryonics

As part of his ever-on-going attempt to isolate and classify the destructive mindsets that lock people into monotonous thinking and waste their time, Alcor Suspension Member Richard Shock has compiled a preliminary listing of personality types in the social milieu of cryonics. Richard wishes to thank Michael Perry and Steve Bridge for their contributions to this list, and encourages readers of *Cryonics* to help flesh out this analysis by identifying presently undocumented categories and submitting them via a Letter to the Editor.

- **Freak Show Cryonics:** Apparent interest in cryonics, motivated solely by morbid curiosity; the most common reason for media interviews.
- **Pseudo Cryonics:** The practice of someone who understands and agrees with the concept, but who will never-under-any-circumstances commit himself to it. Another term for pseudo cryonicists: *cadavers-in-waiting*.
- **Cocktail Cryonics:** Fascination with the whole idea in the same fashion as interest in Black Holes, the Origin of the Universe, and Communist Economics. Similar to Freak Show Cryonics, but not so colorful.
- **Bumblebee Cryonics (Also known as Butterfly Cryonics):** The sort of cryonics practiced by those who flit from one place to another, staying only long enough to drop a few grains of memetic pollen into receptive ears. Often a hub for Cocktail, Freak Show, and Pseudo Cryonics.
- **Herbalife Cryonics:** "All you have to do is get two friends to sign up, then they get two of *their* friends to sign up, and so on,

and so on..." (Also known as Pyramid Cryonics.)

- **McCryonics:** The belief that cryonics would become a major industry if *only* it were given the same flashy, high-powered marketing and advertising other products receive.
- **Ecumenical Cryonics:** "Believing" cryonics will work, rather than treating it as a rational wager. Often closely allied to "Drexlerism."
- **Vulcan Cryonics:** "The concept is so logical, Captain, I find it inconceivable that any intelligent being would not sign up."
- **Mercenary Cryonics:** "Anything you want for a fee: Air transport, legal assistance, surgery..." etc., but no personal interest.
- **Love-my-dog Cryonics:** "I want my dog beside me when I'm dead. The cemetery won't do this. Can you?"
- **Get-it-over-with Cryonics:** "I'm tired of living. Could you just freeze me now?"
- **Apologetic Cryonics:** "I don't want to live *forever*, but..."
- **Reproductive Cryonics:** "I just want not my head frozen, but... well, another part. That's really where I'm at."
- **Ghengis Khryonics:** "You have the freedom to do cryonics any way you want — as long as it's *my* way, which is quite obviously the correct way, just ask me." (Sometimes called **Libertarian Nazi Cryonics**.)



## From the June, 1983 Issue of Cryonics:

### Birth of First Human Cooled to Liquid Nitrogen Temperature Expected

Recently the major wire services and science newsmagazines reported on the successful implantation of a human embryo which had been frozen to liquid nitrogen temperature for four months. Dr. Alan Trounson of the Monash University Medical School in Melbourne, Australia reportedly implanted the embryo in a woman with fertility problems approximately 14 weeks ago. The embryo was one of four which were successfully fertilized in vitro after the woman was superovulated. The first three embryos were placed in the woman's uterus shortly after

fertilization with only one embryo implanting successfully. Unfortunately that pregnancy ended at eight weeks in a miscarriage. The fourth embryo was frozen at the time the other three were implanted and was maintained in liquid nitrogen storage for later use.

An article which appeared in *Science News* (123 (19) 295, 7 May 1983) outlined a preparation procedure similar to that now in use with cattle and other mammalian embryos for cryopreservation. The technical achievement of successfully freezing and thawing a human embryo is not the significant event here. Rather, it is the tremendous ethical impact this experiment is likely to have. Already, some cryonicists are using this development to their advantage in dealing with fundamentalist, Catholic, or "right to life" skeptics who

challenge us about the "problem of the soul." Any cryonicist who's been around for awhile has heard the question; "but where do their souls go when they're frozen?" Many, if not most of these people believe that the soul enters the body at the moment of conception. Hopefully very soon we will have the opportunity to point up that normal, healthy infants who were frozen for months, weeks, or years as embryos can be born who are apparently *not* sans souls.

*Of course, the child of the woman described above was the first in what is now a LONG line of healthy children who — as embryos — spent multiple months in liquid nitrogen prior to implantation. This procedure is now fairly routine. — Ed.*

## Business Meeting Report by Ralph Whelan

The May 2, 1993 meeting of the Alcor Board of Directors began at 1:18 pm.

*Resolved: The April meeting minutes are approved without change. (Unanimous)*

Dave Pizer announced that the June meeting will be at the "Old Fire Station Museum" in Wrightwood, California.

After calculating the 10% rule versus what PCTF owes the OF for expenses, it turned out that the PCTF owed Operating \$26,294.76 at the end of 1992. To relieve the tight cash flow, catch up on bills, and to allow us to handle expenses coming in at the beginning of the recent suspension, \$21,000 has been transferred from PCTF to Operating. The remaining \$5,294.76 will remain in PCTF until (and unless) we need it.

The John Hancock Cash Management Fund (Endowment) had gotten down to a yield of 2.44%. Steve closed it and purchased \$38,000 of a new Term Trust from Dean Witter. It is strictly AAA 10-year Government Bonds, paying 7.5%. There is no commission to get in; \$.05 a share to get out. The Trust matures in 2003 and trades on the open market. Management is by Trust Company of the West (TCW), which Courtney Smith says is one of the top fund management companies in the U.S.

On April 21, 1993, the State Board of Equalization met and unanimously voted to approve Alcor's claim of welfare exemption from personal property taxes. Steve immediately sent a copy of the letter to the local tax collector. We should receive a refund of \$8,257.44, according to our records.

We are having the contractor who did our recent construction give us an estimate on what it might cost to bring the vehicle bay up to code if we (or the City) decide it is necessary. This primarily involves 1) adding a second layer of firewall to two walls (possibly adding two layers to one wall), 2) finishing off one wall, where an opening currently provides a fire route directly to the Patient Bay, and 3) replacing the wooden door into the office area with a metal fire door and sill.

Steve sent a check to Burns-Harrelson-Burns to purchase Premises Liability Insurance. This will protect Alcor primarily against visitors being injured on the premises.

Ralph is working on the next printing of *Cryonics: Reaching For Tomorrow* right now, with the input and assistance of several staff members and volunteers. There will be several substantive changes. Ralph explained that with the implementation of the four-page brochure, and with plans to regularly print outreach-type issues of *Cryonics* produced at very low cost, we

should get *much* more mileage out of this next printing of 5000 *CRFT*, though an overall increase in size and popularity could still cause us to work through them quickly.

April, 1993 was a slow month for Alcor membership growth. In fact, Alcor's total membership as of May 2, 1993, was 356, down from 360 on April 1, 1993. The reasons for this drop are two-fold: relatively high membership attrition and relatively few new members. The attrition this month can be broken down as follows: 1 member was suspended, 2 members asked to have their memberships canceled, 3 members no longer have valid funding arrangements. Due to a need for increased stringency concerning funding arrangements (more on this below), only two individuals in the sign-up process finalized their arrangements and became full suspension members in March. On a positive note, 6 individuals entered the sign-up process in April, including a 16-year-old high-school student, who is independently signing up with his parents' consent.

The effort to assess membership paperwork and funding arrangements gained significant impetus from the recently completed audit. One finding of the audit was that as many as 1/3 of Alcor's members may not have a guaranteed method of funding, i.e., a mechanism such as a collateral assignment or an irrevocable

beneficiary designation which guarantees Alcor's notification should the member change the beneficiary of his/her insurance policy or let the coverage lapse. For this reason, the staff has produced a list of "critical" members (i.e., members with a terminal condition, advanced age, etc.) whose arrangements, especially funding arrangements, will be checked first. Work on this "critical" list, (approximately 50-60 members), has just begun, and should be completed during the first few weeks of May.

Hugh reported that the new "Bigfoot" dewar is about 85% completed. Also, the automated Phase II and Phase III cooling system — which was used effectively in the latest suspension — is about halfway to completion. (I.e., it is already workable and extremely helpful, but needs more work mostly on the software end before it is complete.)

Hugh reported that preliminary tests of liquid nitrogen transfer and holding losses have indicated that the transfer process probably "eats" about 15%. He estimates that we may lose about 10% during holding, more accurate figures to follow soon. Since our cost analysis indicates unaccounted for losses in the neighborhood of 100% (i.e., we appear to get about one half the mileage we would expect in theory to get from our LN<sub>2</sub>), this data raises more questions than it answers so far.

Mike Darwin has offered for sale to Alcor a C-Arm (a "C-shaped" X-ray scanning device with video output) which is being tested right now for workability.

During April, a Northern California member with AIDS deanimated and was suspended. Tanya, Steve, and Hugh traveled to Northern California in the ambulance to stand by and perform the transport, with the active and essential involvement of several Northern California Alcor volunteers. The suspension went extremely well in almost all respects, and the final glycerol concentration achieved was our highest yet for any patient: 7.9 Molar. Several people expressed their gratitude to Tanya and Hugh for doing a great job of preparing us for this suspension. The shortcomings in our readiness that surfaced are being addressed.

The May issue of *Cryonics* includes the Alcor 1992 Financial Statements, as prepared by Stonefield & Josephson. Mike Riskin reported that the Statements indeed show that all of Alcor's money and money management is well accounted for. Improvements in management and training are being pursued, to address the recom-

mendations and suggestions of the auditing firm.

Mike pointed out that the amount of money in the "Deferred Patient Reserve" (as it appears in the Statement) is as much as would be necessary to fund all of our existing patients at the *current* minimums, despite that almost all of them were funded at the previous (lower) minimums, or even at *less than* those previous minimums. (Sometimes *much* less.)

Steve formally noted that the previous Audit Committee was no longer in existence, since its term expired upon completion of the audit. Since one of the auditing firm's recommendations was that we form a standing Audit Committee, Steve suggested that we consider appointing such a Audit Committee.

*Resolved: That Allen Lopp is appointed to investigate potential Audit Committee members, and make recommendations for same prior to the next meeting, so that we may vote on his recommendations at the next meeting. (Unanimous)*

Mark Voelker reported that he has received permission from the County of Pima (in which Tucson is located) to build a cryonics facility in three zones in Pima County.

Allen Lopp reported that there are two reasonably large areas in the Sacramento area that are at extremely low risk of seismic activity, and showed maps indicating the specific locations and risk factors.

Steve circulated a written clarification of the Ten Percent Rule, which reads as follows:

Since at least 1986, it has been Alcor's policy to apply 10% of all unrestricted Operating Fund (General Fund) income to the Patient Care Trust Fund. This policy was originally instituted because the Board of Directors and management felt that funds for long-term patient care were a weak point in Alcor's structure. Some early patients were underfunded, and the Directors were not confident they knew how to predict long-term costs. As a commitment to the patients and to the future health of the Patient Care Trust Fund, the Board of Directors agreed to provide this extra security in the Fund. As of May 2, 1993, the Board of Directors reaffirms this policy.

For the purposes of this rule, the following income sources are considered to be "unrestricted income" and subject to the 10% Rule:

*Emergency Responsibility Fees*  
*(Membership Fees)*

*Interest charges on late payments*  
*Sign up Fees (Membership Initiation)*  
*Unrestricted Donations*  
*Net Excess Suspension Income*  
*Miscellaneous Income*

The following income sources are *not* included in "unrestricted income":

*Literature and magazine sales*  
*Archival Storage Income*  
*Endowment Fund Interest Income*  
*Directed Donations*  
*Jones Trust Income*  
*Companion Animal Revenue*

Since it is unwieldy to use two accounts to handle salaries, insurance, and other joint Patient Care and Operating expenses, during the year the Operating Fund pays all usual Patient Care expenses. Such payments are charged to The Patient Care Trust Fund as liabilities owed to the Operating Fund. At the end of the months of June and December, Alcor's President and bookkeeper together determine the total amounts which 1) Patient Care Trust Fund owes to the Operating Fund for its paid expenses, and 2) Operating Fund owes to the Patient Care Trust Fund under the 10% Rule. The difference between these two amounts is transferred to the appropriate fund.

On a case by case basis, the Board of Directors may choose to have unusual Patient Care Trust Fund expenses paid for directly by the Patient Care Trust Fund.

At any time during the year, the President may transfer Patient Care Trust Fund funds to the Operating Fund to cover Patient Care expenses already paid by the Operating Fund, if cash flow problems necessitate such action. Any such transfer must be reported to the Board of Directors by electronic mail or at the next Directors' meeting.

The Board of Directors may choose at any time to retain in the Patient Care Trust Fund any or all of the money owed to the Operating Fund for paid expenses. Upon such vote, the specified funds would be considered a permanent part of the Patient Care Trust Fund and no longer a liability to the Operating Fund.

*Resolved: That the above Ten Percent Rule Clarification is adopted.*

The meeting was adjourned at 3:38 p.m.

# Advertisements, Meetings & Announcements

The Alcor Life Extension Foundation and Cryonics reserve the right to accept, reject, or edit ads at our own discretion and assume no responsibility for their content or the consequences of answering these advertisements. The rate is \$8.00 per line per month (lines are approximately 66 columns wide). Tip-in rates per sheet are \$200 (printed one side) or \$240 (printed both sides), from camera-ready copy. Tip-in ads must be clearly identified as such.

MARY NAPLES, CLU and BOB GILMORE — CRYONICS INSURANCE SPECIALISTS. New York Life Insurance Company; 4600 Bohannon Drive, Suite 100; Menlo Park, CA 94025. (800) 645-3338.

**EXTROPY: The Journal of Transhumanist Thought #10:** Pigs in Cyberspace, by Hans Morevec; Protecting Privacy with Electronic Cash, by Hal Finney; Technological Self-Transformation, by Max More; Interview with Mark Miller of Xanadu, by Dave Krieger; Nanocomputers, by J. Storrs Hall; Reviews of *Nanosystems, Genius*, books on Ayn Rand. \$4.50 from Extropy Institute; PO Box 57306; Los Angeles, CA 90057-0306. E-mail info from more@usc.edu.

Do you want to keep up with science and technology bearing on cryonics? **PERIASTRON** is a science newsletter written by and for cryonicists, only \$2.50 per issue. **PERIASTRON**, PO 2365, Sunnyvale CA 94087.

"I'D RATHER BE DEAD THAN READ?" — NO WAY! Read *Venturist Monthly News* — News about various cryonics topics — send for free sample copy — Society for Venturism; 1547 W. Dunlap; Phoenix, AZ 85021.

LIFE EXTENSION FOUNDATION OF HOLLYWOOD, FLORIDA provides members with "inside" information about high-tech anti-aging therapies. for free information call 1-800-841-LIFE.

## Meeting Schedules

Alcor business meetings are usually held on the first Sunday of the month (July, Aug., & Sept.: 2nd Sunday). Guests are welcome. Unless otherwise noted, meetings start at 1 PM. For meeting directions, or if you get lost, call Alcor at (714) 736-1703 and page the technician on call.

The SUN, JULY 11 meeting will be held at the home of:  
Marce & Walt Johnson  
8081 Yorktown Avenue  
Huntington Beach, CA

**Directions:** Take the San Diego Freeway (Interstate 405) to Beach Blvd. (Hwy 39) in Huntington Beach. Go south on Beach Blvd. approximately 4-5 miles to Yorktown Ave. Turn east (left) on Yorktown. 8081 is less than one block east, on the left (north) side of the street.

The SUN, AUGUST 8 meeting will be at the home of:  
Russell Cheney  
5618 Ruby Place  
Torrance, CA

**Directions:** Take the Harbor Freeway (110) south from the San Diego (405). Exit on Carson, going west (right), and go all the way to the west end of Carson, in Torrance. Follow Carson as it angles right (north) and becomes Howard Avenue. Go about 1/4 block and turn right onto Ruby Place. There is a bear in the front yard.

**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. For those interested, there is a business meeting before the potluck at 4:00. Once every three months there will be a party or gathering at a local eatery and no business meeting. See details below. If you would like to organize a party, or have a suggestion about a place to eat contact the chapter secretary, Lola McCrary, 408-238-1318. We are also hoping to have speakers on various topics in the near future.

**June 13, 1993:** We will meet at *Harry's Hofbrau* restaurant, in Mountain View, 4:30 p.m. This will be a social gathering only (no business meeting). Harry's is at 399 W. El Camino Real, between Grant and Castro Streets.

The SUN, JULY 11 meeting will be held at the home of:  
Ralph Merkle and Carol Shaw  
1134 Pimento Ave., Sunnyvale, CA  
Tel: 408-730-5224

After the business meeting and potluck there will be an *Introduction to Cryonics* talk at 7 PM, followed by a question and answer period.

**Directions:** Take US 85 through Sunnyvale and exit going East on Fremont to Mary. Go left on Mary to Ticonderoga. Go right on Ticonderoga to Pimento. Turn left on Pimento to 1134 Pimento Ave.

*Alcor's Southern California* chapter meets every other month. If you are not on our mailing list, please call Chapter president Billy Seidel at 310-836-1231.

The *Alcor New York Group* meets on the third Sunday of each month at 2:00 PM. Ordinarily, the meeting is at 72nd Street Studios. The address is 131 West 72nd Street (New York), between Columbus and Broadway. Ask for the Alcor group. Subway stop: 72nd Street, on the 1, 2, or 3 trains. If you're in CT, NJ, or NY, call Gerard Arthus for details at (516) 689-6160, or Curtis Henderson, at (516) 589-4256.

Meeting dates: June 20, July 18, August 15, Sept 19.

New York's members are working aggressively to build a solid emergency response capability. We have full state-of-the-art rescue equipment, and four Alcor Certified Techs and four State Certified EMTs.

The Alcor New York Stabilization Training Sessions are on the second and fourth Sundays of every month, at 2:30 PM, at the home of Gerry Arthus. Address: 335 Horse Block Rd., Farmingville, L.I. For details call Curtis or Gerry at the above number.

**Alcor Chicago** is in the process of starting up. For meeting information and getting on the mailing list, contact Brenda Peters at (312) 587-7050, or; Huron Plaza; 30 E. Huron, Suite 4709; Chicago, IL 60611.

There is a cryonics discussion group in the **Boston area** meeting on the second Sunday each month. Further information may be obtained by contacting Walter Vannini at (603) 889-7380 (home) or (617) 647-2291 (work). E-mail at 71043.3514@Compuserve.com.

**Alcor Nevada** is in the Las Vegas area. Their meetings are normally on the second Sunday of each month at 1:00 PM in the Riverside Casino in Laughlin, Nevada. Free rooms are available at the Riverside Casino on Sunday night to people who call at least one week in advance. **Directions:** Take 95 south from Las Vegas, through Henderson, where it forks between 95 and 93. Bear right at the fork and stay on 95 past Searchlight until you reach the intersection with 163, a little before the border with California. Go left on 163 and stay on it until you see signs for Laughlin. You can't miss the Riverside Casino. For more information, call Eric Klien at (702) 255-1355.

There is a an Alcor chapter in **England**, with a full suspension and laboratory facility south of London. Its members are working aggressively 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.

Meeting dates: July 4, August 1, Sept 5, Oct 3.  
The address of the facility is:  
Alcor UK, 18 Potts Marsh Estate, Westham, East Sussex  
Telephone: 0323-460257

**Directions:** From Victoria Station, catch a train for Pevensey West Ham railway station. When you arrive at Pevensey West Ham 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. Victoria Station has a regular train shuttle connection with Gatwick airport and can be reached from Heathrow airport via the amazing London Underground tube or subway system.

People coming for AUK meetings must phone ahead — or else you're on your own, the meeting may have been cancelled, moved, etc etc. For this information, call Alan Sinclair at 0323 488150. For those living in or around metropolitan London, you can contact Garret Smyth at 081-789-1045, or Russell Whitaker at 071-702-0234.