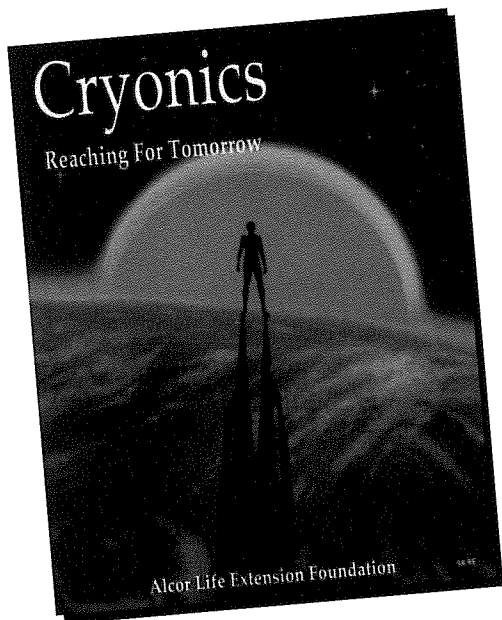


“What is cryonics?”

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

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



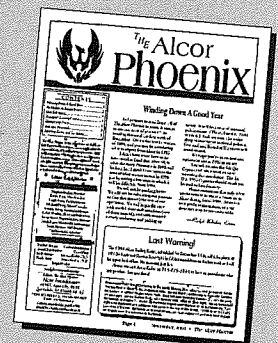
“How do I find out more?”

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

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

For those considering Alcor Membership. . .

If you're intrigued enough with cryonics and Alcor that you're considering Membership, you might want to check out *The Alcor Phoenix*, Alcor's Membership newsletter. *The Phoenix* is a Membership benefit, so it's free to Members and Applicants, but anyone can receive it for \$20/year (\$25/year if you live overseas). It's released 8 times each year, on the “off months” of the quarterly *Cryonics* (February, March, May, June, August, September, November, and December). *The Phoenix* is shorter than *Cryonics*, but appears twice as often and is mailed First Class. Being a Membership newsletter, *The Phoenix* focuses on Membership issues such as financing cryonics, staff and management matters, developments in Patient Care and Emergency Response, etc. These issues will impact you directly if you decide to become a Member, and may help you make a more informed decision in the meantime.



Feature Articles

The Alcor Patient Care Trust
Steve Bridge

CryoTransport Case Report:
Joseph G. Cannon, A-1069
Linda Chamberlain

Depression, Suicide, and Cryonics
Michael Riskin, PhD

Excerpts:
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COLUMNS

ISSUE TO PRESS: JUNE 30, 1997

UP FRONT

BY BRIAN SHOCK, EDITOR

This is only my second issue of *Cryonics*, and already I'm excited about the magazine's progress. So much fine material has come pouring in during the last few months, I couldn't begin to publish all of it this quarter. *Please* keep sending submissions, though — even if I can't print your work immediately, every word helps!

I'd like to dedicate the current issue to long-time cryonicist Joe Cannon, who entered cryonic suspension in February of this year ("CryoTransport Case Report: Joseph G. Cannon, Patient A-1069," by Linda Chamberlain). Joe Cannon was a cryonicist's cryonicist, an engineer, an individualist, a man who felt he could accomplish *anything*. Unfortunately, even *he* couldn't prevail against the degenerative effects of old age and loneliness. Mr. Cannon took his own life, and so greatly compromised his cryonic suspension.

This should serve as a warning to all of us: *anyone* can succumb to depression and forget a lifetime of commitment to cryonics. Psychologist Mike Riskin offers a professional opinion on how to deal with this problem in his article "Depression, Suicide, and Cryonics," following the suspension report. I highly recommend it to anyone — cryonicist or otherwise — who wants to improve his chances of an extended life span.

Dear Editor:

Thomas Donaldson made a sincere attempt to write a fair, balanced report on the Alcor Technology Conference. I respect this but am dismayed by vagueness and inaccuracies in Thomas's description of Olga Visser's rat-heart experiments.

Thomas writes: "Electrical signals came from the heart for a short time, as if it were trying to tell its muscles to beat, but no one saw any sign of beating."

Thomas does not explain how these "signals" were measured. If he means that fluctuations in electrical potential existed, I'd like to know why he feels so sure that these fluctuations originated in the heart. In fact Ms. Visser inserted needle probes attached to an EKG unit which beeped erratically as the probes were jiggled around. The beating became rhythmic when the probes were left undisturbed, but the rhythm coincided precisely with drips of perfusate falling from the bottom of the heart, strongly suggesting that the drips were the real stimulus triggering the EKG through small changes in resistance or ca-

pacitance.

Thomas states that one part of the second heart tested by Visser "had not been perfused." He does not state whether he is referring to perfusate that was applied before freezing, or after freezing (as part of the rewarming procedure). Nor does he state how he was able to tell that a part of the heart "had not been perfused." Nor does he explain how this was possible, since perfusion before and after immersion in liquid nitrogen lasted for a good twenty minutes in each case.

Thomas states that Fred Chamberlain and others "insisted that the same procedure be followed" by Visser in successive trials. On the contrary, she varied the amount of wadding packed around the heart, and also varied the immersion time. In fact she was neither willing nor able to follow precisely the same procedure, because she failed to make many measurements (weight, in particular) to quantify her work.

Thomas states that Visser dissected the hearts. He does not mention that she only did so with reluctance, when Sandra Russell insisted

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Editor: Brian Shock

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Submissions may be sent via e-mail (brian@alcor.org) in ASCII, Word, WordPerfect, or PageMaker format. Mailed submissions should include a PC disk with the file in any previously mentioned format (although printed text alone will be considered). All submitted media become property of the Alcor Foundation unless accompanied by a self-addressed stamped envelope. The Alcor Foundation assumes no responsibility for unsolicited manuscripts, photographs, or artwork. Send all correspondence and submissions to:

Cryonics Magazine, 7895 E. Acoma Dr., Suite 110, Scottsdale, AZ 85260.

About the Cover

Cover photos & diagrams from Joseph Cannon's archival materials

on it and was ready to do it herself.

At one point Thomas mentions that Visser tested three hearts. Later, he says that "Visser did a total of 5 tests that Sunday." I believe that neither of these statements is correct. I was present for the entire run of experiments, and counted four hearts.

Thomas states that Mike Darwin "believed the experiments failed because they destroyed the myoglobin in the heart muscle." In fact if Thomas had interviewed Mike (who was readily available) Mike would have said much more about the extensive damage that occurred.

Thomas does not make any attempt to report on the equipment used or the experimental protocol, which I would have thought should be absolutely fundamental in any description of the experiment, especially the "official version" coming from Alcor itself. I believe Thomas has a formal scientific background. I have no college education in science myself; therefore I expected Thomas's report to be more analytical than anything I would write.

I hope in the future that it may be possible for you to publish detailed, accurate descriptions of crucial events such as the Visser demo. In the same issue of the magazine, Russell Cheney's careful transcript of Ms. Visser's Q&A session and Linda Chamberlain's conscientious suspension report were admirable examples of what I have in mind.

Charles Platt

Dear Charles:

Your point is well taken — Cryonics readers deserve precise reporting. I hope to approach this goal more closely in issues to come.

Fortunately for the cryonics

community, however, you did an admirable job of reporting the Visser demonstration in CryoCare Report.

Brian Shock

Dear Brian,

Hope you are well. I enjoy reading the *Cryonics* magazine and congratulate you on your editorship. I'd like to write a "letter to the editor" here if I could.

In regards to your discussion on page 3 [*Cryonics 2nd Qtr '97 --ed.*] on the possible importance on cloning to cryonics. Imagine you could make a decerebrate clone, one without a cerebrum, but one with the lower brain functions, or even an acephalic clone, one with no brain at all. These could be made in the same way "knock-out" mice are now bred to have specific genes knocked out in order to see the effect of the genes omitted. Could it not be possible for cryonics to use this kind of process for brain transplant of a cryonics patient? One could argue ethical problems with this, although it could be considered similar to donating blood or bone marrow and having it reinfused into yourself. (Even more futuristic, and more ethically problematic, is this scenario: if we consider that what we are is really information, then if you could "download" what makes up "you" from your current brain into a computer, and then "up-load" it into a full clone incubated to be an adult, then you have gained life extension.)

Some comments on the nice article, *Mortal Faith* by David Pizer.

One is on p. 24 where he states, "Nature makes a human body in about 20 years..." I always thought it was 9 months or less, depending

at what stage we consider a fetus human.

On p. 25 he says, "Some scientists now feel the big-bang did not happen." This may be true (about some scientists), but most of main stream science is pretty much convinced about the Big Bang since the galaxies are moving away from each other (red-shift) rapidly, and since the discovery of a cosmic background radiation that corresponds with that predicted by mathematical theories of what would be left over from the Big Bang.

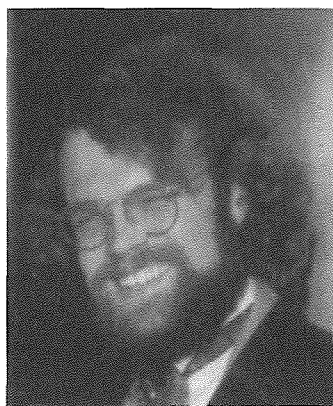
He also says on p. 25 that an "open universe will expand forever, which may allow for immortality." While a closed universe ends in a Big Crunch fireball, an open universe will actually become cold and dark as all the energy is used up, and all life will necessarily die with it at that time. Either way, absolute immortality doesn't seem feasible under either scenario.

Best regards,
Doug Berger, MD

Dear Doug:

I agree with your stance on using decerebrate or acephalic clones as replacement bodies for neuro-patients. To me, a human-shaped organism without a cerebral cortex is equivalent to a legally dead human used for anatomical donation. Of course the acephalic clone would have to be grown intentionally for the purpose of transplants, while legally dead organ donors arrive by a more "accidental" route. No doubt

*Letters Continued
on page 46*



Speculating on “The Future”

I have a friend (well, until he sees *this*, anyway) who reads science fiction novels as though they're blueprints to the future. He annotates them mercilessly, indicating which points he considers unlikely, which are technically implausible, and which are clearly impossible. He seems to believe that if he sieves out all of the “incorrect” ideas from enough science fiction, he can use the results to construct a composite picture of *the* future.

Of course my friend would scoff at this notion. “The future is a lot of things to a lot of people,” he tells me. “People tend to focus on their primary fields of interest. *The* future for a physician isn't nearly the same as *the* future for a physicist.”

I think this also holds for us as individuals. Whether we're scientists, cryonicists, or merely science fiction fans, all of us construct personal visions of *the* future (conscious or otherwise), and then defend these cloud castles with an almost religious zeal.

For most of humanity's existence, *the* future rarely seemed more than an endless repetition of the birth/reproduction/death cycle. Only during the 19th century, when social and technological change accelerated visibly, did anyone imagine *the* future as holding substantially different events from the past. Even then, proto-futurists predicted

change as quantitative rather than qualitative: cities would grow to cover whole states, the smallest hamlet would have its own train station, and giant dirigibles would waft travelers from continent to continent.

During the 1930's and '40's, speculation about *the* future continued to focus on the scale of familiar items. No one doubted the expansion of population and transportation. Science fiction writers dared to suggest that empires on a single world would be replaced by empires spanning entire galaxies. Computers might grow more powerful, a few bright individuals speculated, but only if such machines filled entire factories or skyscrapers.

The personal computer explosion of the 1980's may have unsettled popular notions about *the* future more than any previous event. Few experts predicted that people would bring computers into their homes, and fewer still imagined the effect that personal computers would have on economics, communication, politics, entertainment, etc. With this new level of complexity added to life, many people traded in their visions of *the* future for simple nihilism, hedonism, or apathy.

As cryonicists living outside this mainstream depression, many of us look to nanotechnology for our hints about *the* future. Where the machines of futures-past might smother whole

continents, we now seek devices that could fit inside individual human cells. I find a certain humor in the idea that our projections remain based on scale: smaller, rather than larger.

What is *the* cryonicist's future? In general, most cryonicists picture technology developing more and more rapidly; improvement of information processing will improve the *ability* to improve information processing. Some predict this increasing acceleration will cause society to explode outward to the stars. Some think we will merge with our machines in self-defense. Some don't even try to predict — they merely suggest that the trend will reach a “Singularity,” an asymptotic rise in technology exceeding anything that came before it. All of these variations have one common element, of course: someone manages to reanimate cryonics patients.

Even *the* future of reanimation differs from individual to individual. A few months ago I wrote an article for *The Alcor Phoenix* about “Statements of Revival Preference and Desires.” The motivation for this piece came from an e-mail discussion with one of Alcor's newest members, who needed advice on how to word such a Statement for his cryonics paperwork. After cautioning him about risking too many assumptions about the course of future technology, I

offered a sample Statement that I considered reasonable for myself. Among other items, my Statement requested that no one revive me before medical technology could estimate what percentage of my memories were theoretically recoverable.

I shouldn't have been so unnerved when the new Alcor member pointed out that this in *itself* required a major assumption about technology. Regardless of any self-vigilance, we can't completely escape *the* future that we cobble together within ourselves. Our assumptions, errors, and indulgent fantasies will always trap us in the end, and ultimately muddle even our most careful guesses. We know only one truth about *the* future: its form will surprise us.

(The friend I mentioned at the beginning of this article differs with me on that assessment. "The general form of the future is pretty clear," he insists. "Only the *particulars* will surprise us." Unfortunately, he still refuses to outline this "general form" for me.)

While I remain skeptical of any projections about *the* future, I believe that we as cryonicists can reasonably speculate about the characteristics of *a* future — the one where we can reanimate today's cryonics patients:

1) In the Reanimation Future, a continuous line of cryonics organizations will have survived from the present day. They may exist as underground enclaves or billion-dollar multinational corporations. There may be only one group or many thousands. Cryonics may remain an extremely limited practice or it may become an accepted medical specialty. But one way or another, *someone* will have maintained

today's patients constantly. You can't shove cryonics patients into a dusty corner and expect to find them intact fifty years later (or fifty *weeks* later, for that matter).

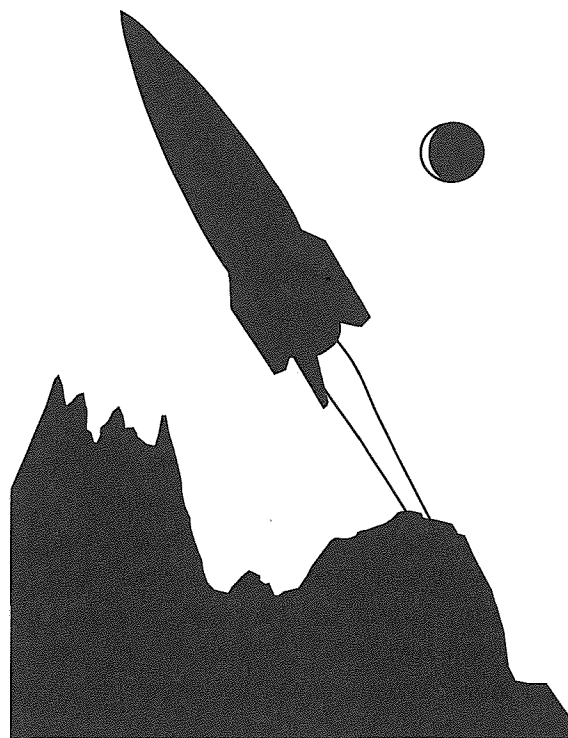
2) The Reanimation Future will have a reasonably well-ordered society that values individual lives. The order may be loose and spontaneous or tight and unimaginably complex. "Individual lives" could mean familiar humanity or anything deemed sentient, whether machine, cyborg, or biological construct. A cruel, chaotic Post-Apocalyptic future wouldn't bother to reanimate cryonics patients even in the unlikely event it had the technology to do so (and even if cryonics patient somehow managed to remain frozen during this "Apocalypse"). A vastly overpopulated future wouldn't waste its resources on reanimating us.

3) The Reanimation Future will reanimate cryonics patients as citizens, not as slaves, zoo specimens, or "spare parts." Almost any future society would have a *much* more economical source for such items among *living people*.

I won't offer these vague notions as absolutes. For every reasonable scenario I propose, you can probably counter with a dozen nightmares:

■ Someone might invent a cryonics storage container that needs no maintenance for eons; cryonics groups might transfer their patients to such containers just before going bankrupt.

■ Technology might develop up



to the point of reanimating patients, and then automatic systems might begin the reanimations just as society collapses.

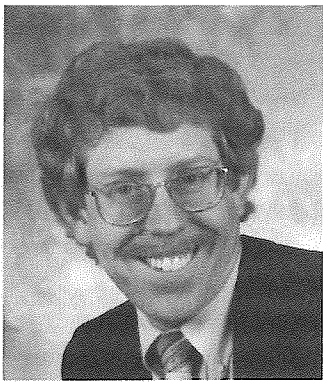
■ Future hyper-intelligent sybarites might reanimate "cryoslaves" as a form of conspicuous consumption.

You can spend the rest of your life playing science fiction writer with all of the permutations. Please feel free to do so, and (as Robert Heinlein might have said) remember to wash your hands afterward.

Will *the* future be a Free Market paradise or will money somehow lose its meaning? Will *the* future belong to humans, intelligent machines, or some composite of both? Will humanity ever travel to the stars, or will we only hover around the Solar system until our resources expire?

I don't know, and I wouldn't hazard to make a serious guess. But that's part of the reason I'm a cryonicist — *I want to find out what happens next!*





The Alcor Patient Care Trust

After five years of work, Alcor is pleased to announce that we have initiated the Alcor Patient Care Trust. The Trust was signed and funded at the May 4, 1997 meeting of Alcor's Board of Directors. Almost all of Alcor's assets dedicated to "patient care" (the expenses of keeping the patients in cryonic suspension) have now been placed within this Trust.

The Trust is still legally a part of Alcor (although a widely separated part), in order to take advantage of Alcor's tax-exempt status. The Trust document allows the Trust Board in the future to apply for separate existence for the Trust with its own tax-exempt status, should that become desirable. If you want to build security in the Trust for yourself or for others, you may make additional tax-exempt donations to Alcor for that purpose (now, or as part of any excess suspension funding at the time of your suspension). Simply include a written statement that your donation is a "directed donation," to be applied to the Alcor Patient Care Trust.

The Trust is much too long to publish in *Cryonics* in its entirety. Only a summary is offered here. The full text is available from Alcor for \$3.00 for Alcor suspension members and people in the sign-up process. The cost is \$18.00 for all others. The extra \$15.00 will be a do-

nation to the Patient Care Trust to help cover some of the legal costs. Anyone who pays the \$18.00 and enters Alcor's sign-up process within 6 months will receive a \$15.00 credit against his or her sign-up fee. The Trust is too long to e-mail.

Call 602-922-9013 or e-mail Joe Hovey (joe@alcor.org) or Brian Shock (brian@alcor.org) to order copies of the Trust by Visa or MasterCard. Or you may mail a check made out to Alcor Life Extension Foundation to 7895 E. Acoma Dr., Suite 110, Scottsdale AZ 85260-6916.

This Trust was written by Arizona trust attorney Lawrence Stevens in conjunction with me. Alcor's Board and staff, various attorneys, and other thoughtful reviewers also offered advice.

Why A Trust Was Needed

Each Alcor member who goes into cryonic suspension donates to Alcor a sum of money (usually through life insurance, prepayment, or a Living Trust) called "suspension funding." Part of the suspension funding pays for the actual costs of transport, chemicals, suspension team workers, etc. Most of the rest is invested to provide ongoing income to pay for the future expenses of keeping the patients frozen. For many years this investment fund was called the "Patient Care Fund" and

was just another internal fund in Alcor. It had policy restrictions on how it could be spent and invested; but it was a regular part of Alcor's assets.

Several years ago, Alcor's Board of Directors came to understand that these most important funds were vulnerable to two kinds of loss. They could be misspent by future Alcor Directors, and they could be a financial target in a case of litigation against Alcor, including a lawsuit totally unrelated to patient care or even unrelated to cryonics. Losing the Patient Care Fund would place Alcor's patients and our very goals as cryonicists at grave risk (pun very much intended). The new Patient Care Trust is a response to those concerns. The "Historical Background" article explains some of the developments over the years that resulted in the current document.

The Alcor Patient Care Trust is revocable and amendable for two years. Since this kind of Trust (a document to protect legally-dead people who may or may not be classified as "legally alive" in the future) has never been done before, we wanted to make sure that major errors could still be corrected. If the Trust is not revoked within two years, it automatically becomes irrevocable on May 4, 1999.

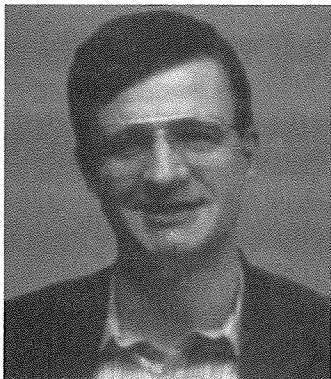
The Trust Board

The Trustee of the Patient Care Trust is a Board of five Alcor members, at least three of whom MUST be related to patients in suspension at Alcor. One and only one individual Trustee must be a member of Alcor's Board of Directors. The individual Trustees are appointed by the Alcor Board to five-year terms. The first Board will have staggered terms so that no more than one individual Trustee will be up for appointment in any year. There is no limit on the number of terms a Trustee can serve.

Once the trustees are elected, they are difficult to remove, and a number of safeguards and checks/balances are in place to safeguard the Trust Board's independence.

The current Trustees are:

5 year appointment:

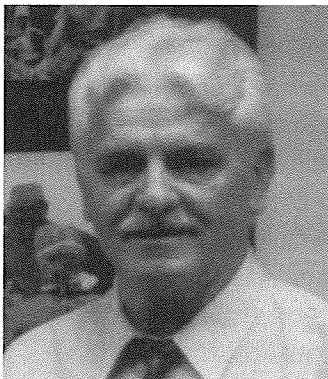


Gary S. Meade

Trust Board Chairperson

Gary is a corporate attorney and has a relative in suspension.

4 year appointment:

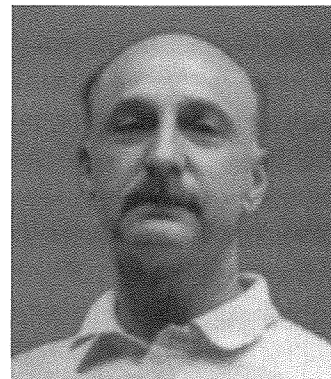


Warren L. Robertson

Trust Board Treasurer

Warren was previously Alcor's CPA for several years and has a relative in suspension.

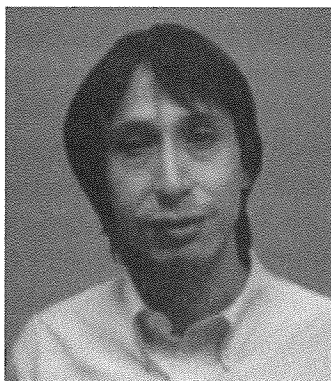
3 year appointment:



Robert A. Schwarz

Bob is a heating/AC mechanic with many years of experience in personal investing. He has a relative in suspension.

2 year appointment:

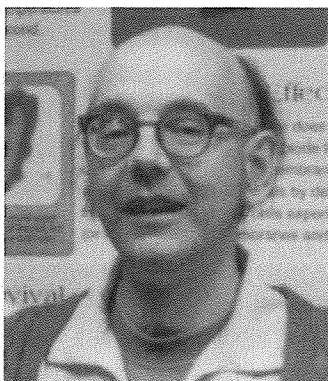


Carlos Mondragon

Alcor Board Representative

Carlos is a past president of Alcor. He has many years experience in banking and finance and is currently a bank loan officer.

1 year appointment:



Thomas Donaldson

Trust Board Secretary

Thomas is a computer engineer specializing in neural nets, the editor of *Periastron* newsletter, and a frequent contributor to *Cryonics* magazine and *CryoNet*. He has many years experience in personal investing and a reputation for being picky about details.

All of the Trustees are over 41 years old. Their experience in cryonics ranges from 6 years to over 20 years.

For the sake of privacy, I will not discuss which Alcor patients are the relatives of Gary, Warren, and Bob.

This group of Alcor members takes its new job of protecting the patients quite seriously. I was deeply gratified by the enthusiasm and commitment of these individual Trustees when we met on May 3 to discuss and organize the Trust Board. I am confident that these people will do all they can to increase the safety and security of Alcor's patients.

Summary of the Trust

1. Purpose and Formation of the Trust.

ALCOR PATIENT CARE TRUST

This Agreement is made this 4th day of May, 1997, between The Alcor Life Extension Foundation, Inc. (a California non-profit, tax-exempt corporation, hereinafter referred to as "Alcor"), as settlor, and the Board of Trustees (hereinafter referred to as "the Trust Board") of the Alcor Patient Care Trust, as Trustee.

Alcor hereby transfers to the Trust the property listed in the attached Schedule A. That property, the proceeds of that property, all additional property received by the Trust from Alcor or from any other person or source, and all investments or reinvestments thereof are herein collectively referred to as the "Trust estate" and shall be held upon the following trusts:

FIRST: The Trust shall be named the ALCOR PATIENT CARE TRUST.

SECOND: The Trust shall be for the exclusive non-profit scientific research and educational purpose of providing care for individuals (hereinafter called "Patients") who have been placed into cryonic suspension or other forms of biostasis as long-term research specimens by Alcor until such future time as it may be possible to repair and revive them to such a condition as will allow them to be considered legally alive, functional, and independent. This applies both to those Patients cur-

rently held in biostasis at Alcor and to those Patients who may be placed into biostasis after this Trust has been established.

THIRD: The Alcor Life Extension Foundation shall be designated as beneficiary of the Trust, acting on behalf of the Patients in biostasis, since at the time this Trust takes effect, such Patients are classified as "legally dead." Should these Patients be classified as "legally alive" at some time in the future or should other Patients later be placed into biostasis by Alcor under conditions where they are classified as legally alive, Alcor shall continue to act on their behalf until such time as these Patients may be made conscious and functional and able to act on their own behalf.

The interests of the beneficiary in principal or income shall not be subject to the claims of any creditor or to legal process, and may not be voluntarily or involuntarily alienated or encumbered.

As you can see, one of tricks of a trust like this is building in flexibility so that the primary object of the Trust — protecting the patients — can be achieved even in the face of legal changes in the future. For instance, we use "biostasis" and not merely "cryonic suspension" because the technology may change in the future. We want the patients protected, no matter what temperature researchers store them at. Also, we don't know what the legal status of people in biostasis will be in 50 years. "Alive" or "dead" or "?????" they need our protection.

By the way, the language in these sections benefits from being read aloud. The real meanings of those

long sentences are more clear when you say them and hear them at the same time.

The last line of Paragraph *THIRD* is part of the legal separation of Alcor and the Trust, to protect the Trust corpus from suits against Alcor.

2. How the Trust estate shall be held and disposed.

(a) The Trust estate shall be invested with a minimum goal of enabling the amount of principal plus investment income to keep the Patients in biostasis as long as may be necessary to fulfill the purpose of the Trust.

The Trust pays Alcor's patient care expense bills and will pay for the eventual reanimation of the patients and their reintroduction into society (if enough money is available at that time). There is also a provision that the Trust can pay for research into repair and reanimation as long as the basic ability to keep the patients frozen is not compromised (the wording is more specific). And of course the Trust pays all reasonable expenses of Trust administration, including travel expenses of the Trustees to meetings. (The Trustees themselves are unpaid volunteers.)

Typically, Alcor will pay the PC expenses from its general operating fund, then submit a monthly itemized bill for reimbursement to the Trust Board. The Trustees can vote to approve or disapprove each item. Then all approved items are reimbursed. Unapproved items must be paid for by Alcor. Alcor can call for binding arbitration if it feels that the Trust Board is wrong. Since arbitration would be expensive and time-

consuming, I would expect that Alcor would be extremely careful about its bills to the Trust.

For large expenses (such as a new Bigfoot dewar) or emergencies, Alcor can submit a request to the Trust Board to pay such expense directly.

The Trust Board and Alcor's Board have approved a detailed definition of which expenses Alcor may properly charge to "patient care." Basically, "patient care" begins only when the patient is in permanent storage in liquid nitrogen (or whatever process or temperature may replace that as "permanent" storage in the future).

The duties of Alcor include the election of the Trust Board, the appointment of the original Investment Manager, contributions of assets to the Trust, all patient care itself, all decisions about the care, safety, and location of the patients, and the future revival of the patients.

There is an interesting check and balance here that may not be immediately apparent. Alcor decides what needs to be done; but the Trust Board can refuse to pay for something that isn't an appropriate expense. This is a bit like the relationship between the U.S. President and the House of Representatives.

3. Election, term, and duties of the Trust Board:

(a) The Trust Board shall consist of five individual Trustees elected by Alcor's Board of Directors. All Trustees on this Trust Board must be Suspension Members of Alcor.

Only one individual Trustee shall be a member of Alcor's Board of Directors. At least three of the individual Trustees must be related to or have had a significant personal involvement (such as a spouse or similar long-term companion) with an Alcor suspension Patient.

(b) No individual Trustee may be an employee or officer of Alcor or receive compensation from the Trust or from Alcor, except for those benefits available to any Alcor member (e.g., standby credits) or as otherwise expressly provided herein.

(c) Each individual Trustee shall be elected by a two-thirds (2/3) vote of the Alcor Board of Directors for a term of five (5) years. The terms of the individual Trustees shall be staggered to provide that no more than one individual Trustee's term expires each year. There is no limit on the number of terms an individual Trustee may serve.

A trust is a legal device by which property is held by one person (the trustee) for the benefit of another (the beneficiary). The person who sets up the trust is called the settlor. The property that is held in trust is known as the corpus or trust fund.

—Brown, Byers, Lawlor. Business Law, Glencoe/Macmillan/McGraw-Hill, seventh edition, 1989.

[Paragraphs 3(d) and 3(e) omitted.]

(f) A unanimous vote of the Alcor Board of Directors is required to remove an individual Trustee for any reason before his/her term has expired. No more than two (2) Trustees may be removed in any twelve (12) month period.

There are several pages describing the Trust Board's duties and empowering the Trust Board to make investments of various kinds, appoint advisors and special sub-Trustees, pay the patient care expenses and other expenses, write reports, and have meetings.

A couple of notes on approvals and meetings: All meetings must have a quorum of three. While the Trust Board approves patient care expense payments by majority vote, any action requires at least three assenting votes. In other words, if only three are at the meeting, all votes must be unanimous. We didn't want a situation where only two Trustees could take action. Any action which requires the unanimous vote of the Trust Board requires the assent of all individual Trustees, whether present or not.

4. Termination of the Trust

There follows a long section about the circumstances under which the Trust may or must terminate. The first paragraph points out the number one consideration:

(a) The Trust Board shall take all legal steps necessary to insure that

the Trust residue is used for the protection of Alcor biostasis Patients before the Trust residue is distributed for any other purpose.

The Trust will terminate when all patients have been revived and reintroduced into society or when Alcor ceases to exist — unless the

Trust has been reorganized into a separate entity. There are a number of creative ideas about where the remaining money (the "residue") should go — other non-profit organizations for revived patients rights, research into life extension, etc. We don't want the Trust residue to be simply handed over to the state, even if we are already immortal, supersmart, handsome, and rich. Under current law, it would not be legal to give donated money back to the revived patients.

The Trust also addresses a possible situation where the last few patients may be in suspension but where Alcor has no way to revive them at that time. The Trust may be sitting on billions of dollars, perhaps much more than would be needed for holding on to those last few hard-to-repair patients. In such a case, a careful process is provided for releasing a portion of the Trust fund for the same uses as might be employed if the Trust was terminated, while still caring for the remaining patients.

5. Revoking and amending the Trust

For the next two years, the Trust is still revocable and amendable by a 2/3 vote of the Alcor Board, unless the Alcor Board votes to make the Trust irrevocable sooner. We didn't want to paint ourselves into a corner until we saw whether these provisions were practical or not. There may be simple changes in the next couple of years that would make it more likely that the Trust could fulfill its purpose.

On May 4th, 1999, unless Alcor's Board has already revoked the Trust or made it irrevocable, the Trust automatically becomes irrevocable. We left one small loophole for future

changes in the law or the economy:

The accomplishment of the purposes of this Trust will depend on developments in science and technology, in the world economy, or in other areas which cannot be predicted at this time. Such changes may render parts of this Trust irrelevant or unworkable, or may prevent the accomplishment of the purposes of this Trust. Therefore, if amendment of the Trust is necessary to accomplish the purposes of the Trust after the Trust becomes irrevocable, the Trust may be amended by a unanimous vote of the Trust Board and of the Alcor Board of Directors. The ultimate purpose of the Trust, as described in Article SECOND, shall not be changed.

6. Assets and Investments

The assets invested in bonds, equities, and money market instruments are under the overall management of the Smith Barney Consulting Group. The Smith Barney Consulting Group contracts with independent investment management companies around the country. These managers are top quality, familiar to some of you, each with rigid investment standards and strategies. Currently we have divided these investments equally among six managers, one each in six diversified investment areas:

Alliance Capital Management. — Large cap growth equity

Oppenheimer Capital — Large cap value equity

Mississippi Valley Advisors — Small cap equity

Lazard Freres Asset Management — Global equity

Madison Investment Advisors — Fixed income — Intermediate government and corporate bonds

U.S. Trust Company of California — Fixed income — 1-10 year Treasury portfolios

The Trust has approximately \$650,000 in these investments.

The Trust has custody of Alcor's ownership position (approximately 58%) in Cryonics Property, LLC, the limited liability company which owns the building Alcor is in. The Alcor book value is \$185,000 (the purchase price). The depreciated tax value is lower; the appreciated sales value is about 50% higher (but we're not selling the building, so it doesn't matter too much).

The Trust also takes over ownership of the mortgage on the Alcor building, about \$495,000 at 10%. For the past two years, rents on the building (occupied by four other reliable tenants besides Alcor) have been well ahead of expenses. Since Alcor itself took over the mortgage at the beginning of 1996, income to Alcor's Patient Care Fund from the mortgage alone has been in excess of patient care expenses. This left the Patient Care Fund stock/bond investments to grow without being disturbed (in a very good year for growth).

Finally, the Trust has ownership of the patient dewars and other equipment involved in patient care.



ALCOR PATIENT CARE TRUST

This Agreement is made this 4th day of May, 1997, between The Alcor Life Extension Foundation, Inc. (a California corporation, hereinafter referred to as "Alcor"), as grantor, and the Board of Trustees (hereinafter referred to as "the Trust") of the Alcor Patient Care Trust, as trustee.

Alcor hereby transfers to the Trust the property listed in the attached Schedule A. The property, the proceeds of that property, all additional property received by the Trust from Alcor or from any other source or source, and all investments or investments thereof as herein collectively referred to as the "Trust assets" shall be held for the following uses:

FIRST: The Trust shall be used for ALCOR PATIENT CARE TRUST.

SECOND: The Trust shall be for the exclusive benefit of scientific, research and educational purposes of providing care to individuals (hereinafter called "Patients") who have been placed into cryonic suspension or other forms of frozen or long-term storage by Alcor and such Patients and any legal beneficiary thereof and shall also be used to make a donation of such Trust assets to be considered legally educational and independent. The assets here to these Patients excepted and as because of Alcor and to those Persons who may be placed into frozen after the Trust has been established.

THIRD: The Alcor Life Extension Foundation shall be designated as beneficiary of the Trust, and in the event of the death of any person, none of the assets of the Trust shall be used for purposes other than those stated in this Agreement. Should any Person be placed into frozen by Alcor under conditions where they are classified as legally alive, Alcor shall continue to care for such Person and such care as Alcor deems necessary to maintain and maintain and shall not be used for any other purpose.

The interest of this trust shall be perpetual or longer and shall be subject to the claims of any creditor or in legal process, and may not be voluntarily or involuntarily assigned or transferred.

FOURTH: Any act which would adversely affect the tax exempt status of this Trust or of Alcor shall be prohibited notwithstanding any provision in this Agreement concerning otherwise.

Alcor Patient Care Trust History

The notion of placing the Patient Care Fund into a trust was first suggested to the Alcor Board of Directors about 1991. I don't know who first brought up the matter; but it was a major topic of discussion by the time I joined Alcor's Board in September, 1992. Looking back, I remember a couple of Alcor members pushing hard for a trust, claiming it was so simple *they* could write one. That evaluation turned out to be hopelessly naive.

In the fall of 1991, then-President Carlos Mondragon asked an attorney to look into various strategies for protecting Alcor's Patient Care Fund, which was a separate accounting fund within Alcor. In October, 1991, this attorney replied that it would be extremely difficult to form a trust for this purpose, since the money had already been *donated* to Alcor and since the patients, having no legal existence, could not be the "beneficiaries" of a trust.

In November of 1991, one of the Alcor Directors apparently suggested that there might be some legal protection gained by *renaming* the Patient Care Fund to the "Patient Care *Trust* Fund," even if no trust was formed. The minutes were unclear on whether a motion was passed to this effect; but the next month Carlos began referring to the

fund as "The Patient Care Trust Fund."

No further action seems to have taken place until the September, 1992 Board meeting, when the Board again stated that the fund should be called the "Patient Care Trust Fund," and requested that Carlos Mondragon seek more legal opinion about actually creating such a trust. (Several attorneys later told me that renaming the fund was wasted effort and that no protection was offered by a mere name change.) Carlos got no further useful thoughts from the original attorney he had consulted; so he wrote to a second attorney Alcor had worked with in the past.

When I became Alcor's President in January, 1993, the second trust attorney still had not responded and, since he wasn't even returning my telephone messages, we decided to look for another attorney. David Pizer had found a San Diego trust attorney he liked, so I drove there for a day to explain Alcor's structure and why we needed a trust. The legal firm wanted a deposit of about \$2,500 to "explore" what needed to be done to create a Trust. Alcor's Board approved giving this a try. After three months, this attorney was frustrated by what she saw as irreconcilable requirements from Alcor's

Directors. From her viewpoint, Alcor's Board seemed to want a document which "looked" like a trust but which was in fact a pipe dream. She suggested we set up a second non-profit corporation instead to separate the money. Both her interest and ours dropped off quite a bit at this point, and we ended that relationship.

In the late summer of 1993, Saul Kent suggested that I contact Kathryn Ballsun, a Los Angeles attorney considered to be one of the foremost Trust experts in the state (research on her by another Alcor member and attorney confirmed that evaluation). She had been involved as a legal advisor on the Richard Clair Jones case (which partially concerned a trust) and was already familiar with Alcor and cryonics. Ms. Ballsun wanted a \$5,000 retainer, which she felt would be sufficient to do the research and write a trust, as long as two conditions were understood. 1) I, as President, would have to do the majority of trust writing, with her advice and direction, and 2) she had to be kept out of Alcor Board arguments over details. Like I said, she was *familiar* with Alcor.

Ms. Ballsun did give Alcor some basic advice and suggestions on what our legal structure might be; but af-

ter that progress was made only very slowly. (She *did* recommend that we remove the word "Trust" from the name "Patient Care Trust Fund," since it could be seen as was misleading. Alcor's Directors changed the name to "Patient Care Fund" once more in late 1993.) During that period, I was deeply involved in plans to move Alcor to Arizona and other complex activities, so I didn't use a lot of energy on the trust work. Once we finally moved to Scottsdale in March of 1994 and got settled in, I began working on the first major requirement for a trust — the Board of Directors had to decide in advance *what they wanted*.

As the arguments began, I realized why Ms. Ballsun had requested that I handle those questions before she got more involved. Between July and December, I went through five full drafts of a trust outline, and countless e-mail discussions of each point, major and minor. I estimated at that time that I had spent at least 100 hours on those drafts, and it might have been double that. Finally, in late December, 1994, I had ten pages of outline that the Directors could agree upon. I sent them off to Kathryn Ballsun.

The reply was not what I expected — she no longer wanted to write the trust. I suspect that she saw how incredibly complex this trust might become and that her previous cost estimate was way too low. In any case, she gave us one piece of excellent advice: that we hire an Arizona attorney, since we were now in that state and since Arizona's trust laws were more flexible than California's. (Dave Pizer, Alcor's Vice-President at the time, had also suggested this at the time we moved to Arizona.)

I called Ron Carmichael, Alcor's

corporate attorney, who had performed excellent service in getting Alcor to Arizona. He suggested I speak with his firm's trust attorney, Larry Stevens. By this time, Alcor's Directors were frustrated with the parade of attorneys and reluctant to approve any more spending. They eventually agreed to try once more if I could get a one-hour, no-fee meeting with Mr. Stevens to discuss whether a trust was workable. I met with Larry Stevens on March 7, 1995 and had one of those "Eureka!" breakthroughs.

Mr. Stevens was thoughtful and sensible. Refreshingly, he immediately understood the problems of cryonics and trusts, but was unfazed. He said, "Yes, this can be done. It will require some unique legal thought. I will still want you to do the basic writing and arguing with the Board to hold down costs and so the trust does what you want it to do." He then outlined the next steps.

Mr. Stevens first suggested that if we wanted the maximum in credibility for the trust, that we should have a trust company or a bank as Trustee or co-Trustee. He also said that we needed to begin interviewing trust companies and trust departments of banks right away, so we could see how they reacted to our ideas. If we could get one of these financial institutions to become involved with Alcor, the trust company's attorneys might be helpful in reviewing the trust itself and in giving suggestions. Further, since it was obvious that I was not very knowledgeable about the legal language of trusts (beyond the personal trusts being used for suspension funding by some Alcor members), this would give me a chance to learn more.

At this point, Dave Pizer be-

came very involved. He helped me set up appointments with officials of several trust banks or trust departments, and he sat in on each interview. Several of the officials (or their bosses, perhaps) appeared to be bothered by cryonics; but four major companies were interested enough to pursue us for another round of talks. At the end of that time, we selected Northern Trust Bank (3rd largest trust bank in the U.S.) and Norwest Bank (one of the largest banks in the country) to work with as possible trustees. Officials from both companies gave me copies of various sample trusts to read and opened my eyes to some potential problems.

During the summer of 1995, Larry Stevens and I went through several drafts of a full Patient Care Trust. Each change required discussion (sometimes intense debate) among Alcor's Board, especially since some changes were major departures from my December, 1994 outline. Dave Pizer and Carlos Mondragon especially challenged me to clarify my language and to address areas of concern; but every Alcor Director and most staff members made at least one detailed review of the document. We arrived at a system of co-trustees, one being a trust bank and the other being a board of five Alcor members.

About October 1, we had a document we thought might be the final answer, so I submitted it to Gail Bradley at Northern Trust (which had been the most helpful to that point) for review and to see if Northern would consider being the "corporate trustee." Gail forwarded the trust document to Northern's corporate attorneys in Chicago. The answer in November, fleshed out and reinforced by a personal meeting in De-

ember, was startling to me and delayed the trust several more months.

Northern's attorneys explained that they were in the practice of acting as trustee only for very "passive" trusts. These might be trusts where a family's money or a company pension fund was invested and cared for, but where the only other trustee activity was writing checks to the beneficiaries. Alcor was asking for something well beyond Northern's corporate mission. Our Patient Care Trust would require the corporate trustee to take an active role in making complex business decisions

in a field (cryonics) about which trust bank officers could know little.

One of their most important concerns was that if Alcor went out of business someday and failed to appoint future Trust Boards, the bank would be placed in the position of being *sole* trustee, including having custody of the *Patients*. The attorneys said it did not matter that these responsibilities were excluded from the corporate trustee in the Trust Agreement. If the bank had a trustee relationship, a court could make them sole trustee if necessary. It had already happened to Northern at least once in the past. Besides that, our trust would require more and more complex decisions in the distant future, creating further potential for their company to be sucked into cryonics management. Finally, they noted that as a participant in management decisions, a huge corporation like Northern Trust Bank was at greater risk for being a major deep pocket in any future litigation.

Northern Trust's managers said

that they would be happy to act as "Investment Manager" for the Patient Care Trust, and that they were not intimidated about cryonics itself; but they could not act as a trustee. I reported this to Alcor's Board of Directors on December 29, 1995 and suggested that Northern's attorneys had a valid argument. Since I figured that other banks would have the same reaction, I sug-

"One of [Northern Trust Bank's] most important concerns was that if Alcor went out of business someday and failed to appoint future Trust Boards, the bank would be placed in the position of being *sole* trustee, including having custody of the *Patients*."

gested we move immediately toward rewriting the trust to be administered solely by a trust board. At the January, 1996 Board of Directors meeting, the Board asked me to instead submit the trust as it was to Norwest Bank and one other somewhat cooperative bank to see if the answer was the same.

It took about three months to get the same negative answers back from those two institutions. Around the beginning of April, 1996, Larry Stevens and I began yet another major redrawing of the trust. Major drafts went out for review on May 25, July 26, August 20, and October 9th. Most Alcor staff members and Directors did at least one detailed evaluation of the text during this time; but I have to congratulate especially Dave Pizer and Carlos Mondragon for being willing to slog through this material in detail so many times. Each time I thought we had a final draft, someone would come up with a major consideration or ambiguous wording that I had

missed. During this time, we were also fortunate enough to receive detailed criticism from Mary Margaret Glennie, David Brandt-Erichsen, Natasha More, and Denise Babin.

In September, 1996, after the Alcor Board had determined that Fred Chamberlain would become Alcor's President, Fred and I decided we needed to work together in making a final recommendation to

Alcor's Board concerning which company should be the initial investment manager for the Trust. I still favored Northern Trust, which had given us so much use-

ful advice. However, by that time another candidate had emerged. Alan Stoner, a financial planner for Smith Barney investments, had visited Alcor for personal reasons — he wanted to sign up. When he heard about the proposed trust, he began speaking with higher-ups in Smith Barney's "Consulting Group" about the possibility of competing for the position of investment manager. Alan's initial discussions with us sounded like he might be able to present an attractive proposal, so we included Smith Barney in our evaluation.

In late September, representatives of Northern Trust Bank and Smith Barney Consulting Group met with Fred and Linda Chamberlain and me. (Linda was included because she was a Board Member and had been the chairperson of the Patient Care Investment Advisory Committee for several years.) Smith Barney's presentation was more impressive, and the flexibility and administration of the Consulting Group

appeared to be a better fit for the Trust than Northern's more rigid structure. I still consider Northern Trust Bank to be a trustworthy, cooperative institution, and they had been extraordinarily open and helpful over the preceding year; but for this purpose I reluctantly agreed that Smith Barney was our best choice.

The near-final text of the Trust was approved at Alcor's Board meeting on November 3, 1996. However, we still did not have five members for the initial Trust Board. We had all agreed early on that we wanted Warren Robertson, CPA and attorney Gary Meade on the Trust Board; and Carlos Mondragon eventually agreed to be the Board representative. It took more discussion and persuasion before we added Robert Schwarz and Thomas Donaldson to the final five. Some of this process was delayed by my own career switch and by the details

involved in turning over Alcor's presidency to Fred Chamberlain.

The five Trust Board candidates met in Scottsdale on Saturday, May 3 to "workshop" their way through the Patient Care Trust with me. We read the Trust aloud, discovering a few more minor typos and revisions needed for clarity. Alan Stoner from Smith Barney was present to answer investment questions for an hour. The Trust Board members agreed on officers and on what the procedures would be for meeting, votes, and paying Alcor's patient care bills. On Sunday, May 4th, Alcor's Board formally approved formation of the Alcor Patient Care Trust and elected the five trustees.

Five years have gone into the formation of this document. I can no longer count the number of hours, even of my own time, which were involved. The cost of photocopies and postage alone (especially after

the Trust became too long to e-mail) is probably fairly large. I can say that the cost of attorney fees was about \$6,000 in "learning experience payments" to California attorneys through 1994 and \$3,700 to Larry Stevens from 1995-1997 for the actual Trust. Larry Stevens did a wonderful job on the Trust and was worth every cent.

The Alcor Patient Care Trust has taken much longer than any of us would have predicted, well beyond the patience level of most individuals and institutions. But we are cryonicists, and protecting the patients is always #1 on any Top Ten list of our duties. That patience has finally been rewarded, and the future of our friends and family in suspension — and our *own* suspended future — is now much more secure than it has ever been.



A Testimonial by Gary Meade

As an attorney as well as an Alcor member and someone who has a loved one in suspension, I am pleased to be able to give my wholehearted professional and personal endorsement of the newly established Alcor Patient Care Trust. I believe the Trust will provide the best means of legally protecting the patient care fund assets, thereby helping to ensure the long-term care of the patients in suspension. That is the reason I enthusiastically agreed to serve as a Trustee and Chairperson of the Trust.

Conceptually, the Trust is an excellent idea. The assets in the patient care fund are being placed in trust, to be held by the Alcor Patient Care Trust as a separate

legal entity. This will provide the maximum legal protection for these assets, both against claims by others as well as possible misuse for purposes other than patient care. The Trust Agreement requires the Trustees to act in accordance with the Trust's stated legal purpose, which is "providing care" for the patients in suspension. The Alcor Life Extension Foundation is the legal beneficiary of the Trust, and as such has the absolute legal right to enforce the Trust Agreement and ensure that the Trustees act in such a manner.

The Trust itself is well-planned and skillfully crafted. This is the first trust ever established to care for those who are legally dead and who therefore have no rights under

the law. This presented some novel legal challenges. The drafters of the Trust overcame these and I believe the completed Trust successfully accomplishes everything it was intended to do.

Everyone with an interest in cryonics owes a tremendous debt of gratitude to those who worked so hard to set up the Trust, including the outside trust counsel, the Alcor Board, and especially Steve Bridge. Of course, those having the greatest such debt are the patients themselves. It may be presumptuous of me to do so, but I would like to extend on their behalf a most sincere "Thank you" to all for a job very well done.



CryoTransport Case Report:

Joseph G. Cannon, Patient A-1069

Report prepared by Linda Chamberlain, CryoTransport Manager
Graphs and Cooldown Data by Hugh Hixon, Facility Engineer
Alcor Life Extension Foundation

Background History and Synopsis

Mr. Cannon was a pioneer in the cryonics community. In 1971 he created a for-profit company (CRY O ERA CORPORATION) to design and sell "cryogenic interment equipment," and involved himself in three major cryonics-oriented projects. The first was the design and fabrication of the first four-patient capsule (a design that looked remarkably like that being used by Alcor today). The second was the building of "Hope Knoll," which was to be a facility for long-term storage of patients from any cryonics organization. The third was an attempt to get a bill passed by the Wisconsin legislature (to quote from a letter dated March 20, 1971) "to alter interment laws so as to properly encompass cryogenic interment."

Unfortunately, the Wisconsin legislature instead decided to make cryonic interment illegal. This resulted in making the Hope Knoll facility of little use. For nearly two decades, Mr. Cannon and his wife, Terry Cannon, wintered in Avon Park, Florida and returned to Wisconsin in the summer. Disappointed in their dealings with the State of Wisconsin, the Cannons began to spend less time there.

Over the next 25 years, Mr. Cannon was an active supporter of cryonics. His striking good looks, sense of humor, and congenial per-

sonality made him a popular participant on television shows featuring cryonics. Mr. Cannon often expressed considerable interest in ways to notify Alcor in case of an emergency or sudden death for either himself or his wife. He had emergency transport medication arrangements with a local hospital, air evacuation arrangements with a lo-



Joseph G. Cannon

Date of Birth: Jul. 22, 1915

Date of Biostasis: Feb. 21, 1997

cal air ambulance company, and had put together a sleep apnea monitor/autodialer combination. He was also the first Alcor member to set up a "Wisconsin Trust" (Wisconsin is among the few U.S. states that have no rule against perpetuities for trusts).

After his beloved wife, Terry,

was placed into biostasis by Alcor in 1985, Mr. Cannon lived alone in their home at Avon Park, Florida. His loneliness and depression gradually deepened over the years. An optimistic, forward-looking attitude gradually turned negative. Mr. Cannon's life ended in great tragedy.

[Another article in this issue of *Cryonics*, "Depression, Suicide, and Cryonics" by Michael Riskin, explores the importance of depression as it relates to all cryonicists. --ed.]

Early in 1995 a hospital chain purchased the hospital with which Mr. Cannon had made arrangements. The new management declined to continue the agreement to assist with the emergency protocol he and Alcor had established earlier. Shortly thereafter, Mr. Cannon was diagnosed with prostate cancer. In September of 1995 Mr. Cannon's doctor informed him that, given his cardiac output, he was not expected to live more than 90 days. Mr. Cannon returned the apnea monitor to Alcor and, in great contrast with many earlier video appearances, expressed pessimism about his cryonics arrangements in an interview for the Discovery Channel (filmed in October of 1995 and shown in October of 1996). In early 1996, he informed Alcor that he had made arrangements to be cremated.

During this crisis, Steve Bridge (then president of Alcor) and Hugh

Hixon (long-time Alcor staff member) urged Mr. Cannon, through a series of phone calls and letters, to move to Scottsdale, Arizona. At one point, he almost did just that. If he had, things might have gone better for him. Shortly thereafter, Hugh Hixon visited Florida to see if he could raise Mr. Cannon's spirits and get him to relocate to Arizona. Hugh did manage to get Mr. Cannon to rescind his cremation order, but could not persuade him to leave Florida.

Although Hugh Hixon returned the apnea monitor to Florida, Mr. Cannon would not use it, just as he would not wear his Alcor medic alert bracelet (this was not, however, specific to cryonics; he also refused to wear a wristwatch). The local mortician with whom Mr. Cannon had made arrangements earlier -- first for assistance with his remote transport, and then for cremation -- was very cooperative, to the point of keeping ViaSpan (a blood substitute) in his refrigerator.

Medical History

In response to an inquiry from Alcor, in a letter dated December 15, 1995, Mr. Cannon's personal physician made the following diagnosis: "Mr. Cannon has been diagnosed with CA [cancer] of Prostate, End-stage Cardiac Disease and Progressive Lung Disease. Mr. Cannon's condition is terminal, he has exceeded his life expectancy of 60 days, but death is imminent. Patient's records will follow per 1987 written authorization and verbal authorization today." Mr. Cannon smoked heavily most of his life, but the amount of his tobacco usage was not documented. (Medical records dating back to 1987 are in the patient record.)

Mr. Cannon had coronary bypass surgery in 1985 and recovered to live another 13 years. The prostate cancer was detected in early 1995. In May 1995, Mr. Cannon was scheduled for an ultrasound biopsy prior to surgery for the implantation of radium crystals. He had been taking aspirin prophylactically since his coronary bypass but was instructed to discontinue this medication for three weeks before his biopsy.

Perhaps due to the lack of aspirin, he began to experience severe chest pains. A myocardial infarction of the anterior wall and a transient ischemic attack put him in the hospital for three days. Upon his discharge, Mr. Cannon felt well enough to go dancing (a frequent activity of his).

In June of 1995 he started a course of treatment (for his prostate cancer) with *Lupron*, a synthetic suppresser of steroid production. In some cases, *Lupron* is associated with altered emotional states; Mr. Cannon reportedly experienced heightened depression while on this medication. Although Mr. Cannon lived far beyond the expectations of his physician, his depression continued to grow over the next year and a half.

Cardiopulmonary Arrest

On Sunday, February 16, 1997, Alcor received a call from Mr. Cannon's neighbor and Medical Surrogate (designated by his Durable Power of Attorney for Health Care). Mr. Cannon's final tragic episode had begun.

On the previous Thursday, while trimming citrus trees in his yard, Mr. Cannon had fallen from a ladder and broken a rib. He was treated at the Emergency Room in a local

hospital. Increasingly depressed as a result of this incident, he returned to the hospital on Friday but was twice refused admittance. According to his Medical Surrogate (MS), Mr. Cannon began to talk to his tenants and neighbors about committing suicide. Upon hearing this, MS and the tenants went to Mr. Cannon's house to check on him. They found him lying on the floor dressed only in pajama bottoms, with a plastic bag over his head. Two gas cylinders were by him on the floor. These were the oxygen bottles that he had earlier purchased as part of his emergency rescue equipment.

MS called 911; both a paramedic and the police responded. MS dressed Mr. Cannon, and he was taken to a local evacuation and stabilization facility. Later that day, healthcare workers reported to MS that he was "okay" and they were "making up his lunch." Mr. Cannon was then transferred to a regional psychiatric center in Polk County (north of Highlands County, where Mr. Cannon resided), and placed in an observation ward.

Alcor personnel found several problems in speaking with MS and trying to find out how to get in touch with Mr. Cannon. First, Mr. Cannon had been telling MS and other neighbors that he was not so sure he even wanted to be frozen anymore. Although we tried to explain to MS that Mr. Cannon's change of heart (almost 30 years of activism in the cryonics movement) was a manifestation of depression, we were only marginally successful. MS was an elderly woman herself and not familiar with cryonics philosophy or technology.

The second and insurmountable hurdle was hospital policy. Since Mr. Cannon had been admitted to a psy-

chiatric ward, hospital authorities would allow no incoming communication with him, though Mr. Cannon was permitted to call out if he chose. His only reported call was to MS on Monday, February 17, 1997. Afterward MS told Alcor that Mr. Cannon "sounded like the 'Old Joe,' again." This uplifting of his morale seemed to help her understand our conviction that Mr. Cannon's apparent change of mind about cryonics was due only to depression. Unfortunately, MS's new understanding did nothing to help us communicate with Mr. Cannon. The hospital would not even admit that he was a patient, much less let anyone (including MS) call him.

In addition to our attempts to find a way to speak with Mr. Cannon, we also stayed in very close communication with the cooperating mortician, who gave us the name of the Highlands County Medical Examiner. After we discussed the situation with this official, he agreed to limit his autopsy (sparing the brain and head) should Mr. Cannon commit suicide.

Over the next few days we made many attempts to find ways of contacting Mr. Cannon. Several Florida cryonicists from other cryonics organizations (Bill Falloon and Saul Kent of CryoCare, and Dayna Dye of American Cryonics Society) were concerned and offered to help. They met the same resistance at the psychiatric ward as we had. Our legal counsel advised us not to use Mr. Cannon's anatomical donation to Alcor and his arrangements for cryonic suspension as our reason for getting in touch with him; hospital personnel might be prejudiced against cryonics, and their prejudice might cause them to prolong Mr. Cannon's stay.

Unable to affect Mr. Cannon's treatment in any way, we could only hope the hospital would administer anti-depressive drugs that might lift his mood and return him to a more reasonable state of mind. After Mr. Cannon was released, we planned on using this close call to convince him that he should move to Arizona where he would be surrounded by cryonicists. However, all efforts to communicate with Mr. Cannon were unsuccessful, and our hopes for the benefits of anti-depressants were unfulfilled.

**Remote Transport:
CPR, Medication, and Initial
External Cooling**

Participants:

Remote transport team:

Linda Chamberlain, CryoTransport Manager; Fred Chamberlain, President;

Alcor central logistics team:

Hugh Hixon, Joe Hovey, and Mathew Sullivan.

Alcor Directors:

Linda Chamberlain, Hugh Hixon, Keith Henson, Carlos Mondragon, Dave Pizer, and Mark Voelker.

At approximately 8:00 AM MST on Thursday, February 20, 1997, Alcor received a call from the mortician, who reported that Mr. Cannon had committed suicide at the hospital sometime the previous evening. The nursing staff found him in the morning, under the sheets with a pillowcase around his neck. The exact time of death was not known or estimated. The medical surrogate and Mr. Cannon's one relative (a sister, also living in Florida) felt that under the circumstances — many hours of warm ischemia — cryo-transport procedures were no longer

an option. They had given the mortician instructions to cremate Mr. Cannon.

Because we had been in daily contact with the mortician, he knew of our concerns and our determination to get Mr. Cannon frozen regardless of the circumstances. He decided to call Alcor before proceeding. If he had not, or if Mr. Cannon's MS had not called him so quickly, the situation might have been beyond hope. Mr. Cannon was scheduled for an autopsy, and since he was in Polk County, the autopsy would not be performed by the Highlands County Medical Examiner from whom we had gained cooperation a few days earlier.

Fred Chamberlain, President and CEO of Alcor, called an emergency Board of Director's meeting. Less than one hour later, all Directors (except Steve Bridge, who was not available) were speaking via telephone. Carlos Mondragon, with many years of experience in both cryopreservation and legal battles, had a clear picture of how to proceed. Dave Pizer, who also had extensive experience in legal battles, advised against any confrontations, suggesting instead we take an assumptive stance in negotiations. Keith Henson, who (due to other projects), knew several attorneys in Florida, offered to contact Florida attorneys as a backup. Michael Riskin (Ph.D. in psychology) volunteered to speak with any relatives, hospital authorities, medical authorities, etc., who might seem hostile. Linda Chamberlain would identify the appropriate medical authorities and coordinate with the other directors. Hugh Hixon was to find videos of Mr. Cannon which might evidence his commitment to cryonics over the years (to help substantiate

his desire to be frozen). Brian Shock, Alcor Membership Administrator, would develop document packages for faxing to those who might need hard copy details. A teamwork plan designed to rescue Mr. Cannon from an autopsy or cremation developed quickly.

Carlos Mondragon (Director) and Fred Chamberlain (President) began a series of conference telephone calls to find and speak with the Medical Examiner who would be in charge of Mr. Cannon's autopsy, scheduled for early that afternoon. Less than ten minutes had elapsed when an urgent call from Keith Henson (Director) told us that the problem was already under control. Keith had reached the doctor assigned to the autopsy, and a cooperative relationship had been established.

Carlos Mondragon and Fred Chamberlain continued their teleconference outreach, speaking with Mr. Cannon's mortician, Mr. Cannon's personal attorney, and even the State Attorney's office. The State Attorney agreed that the Medical Examiner could limit autopsy to spare Mr. Cannon's brain. The limited autopsy was moved to an earlier time at our request and the mortician was at the hospital, waiting when Mr. Cannon was released. The mortician packed Mr. Cannon in ice, moved him back to the mortuary, and then put Mr. Cannon in a refrigerated unit until Alcor personnel could arrive.

Although the situation appeared momentarily improved, Mr. Cannon's sister-in-law still wanted to see him cremated, and Mr. Cannon's medical surrogate and neighbor remained on the fence about whether Mr. Cannon had really changed his mind about cryo-transport. The Alcor Board of Di-

rectors felt that the greatest danger to Mr. Cannon would be a possible legal battle if either of these two individuals learned that Alcor was proceeding to freeze Mr. Cannon. Less than five hours after receiving the report that Mr. Cannon had committed suicide, Alcor's Cryo-Transport Manager and Alcor's President (Linda Chamberlain and Fred Chamberlain, together with paperwork and video tapes documenting Mr. Cannon's years of participation in and support for cryonics) were bound for Florida in case such a contest arose.

Because of the unknown amount of damage to Mr. Cannon's body (from many undocumented hours of warm ischemia plus an autopsy of the thoracic and abdominopelvic cavities) and the possibility of a legal battle in Florida, we were not yet certain how to proceed should we gain possession. If there was considerable additional delay caused by the need to appeal to the courts for custody of Mr. Cannon's remains, we would transport him to Scottsdale without further delay or procedures. If we gained custody without further delay, we would attempt a blood washout with the ViaSpan the mortician had on hand. In that event, and since the timing on catching a plane in Phoenix did not allow for equipment to be shipped from Alcor Central, we would have to use the mortuary equipment. On this contingency, the mortician had been briefed just a few days previously on how to clean his equipment for our use.

When we arrived in Orlando, we called the mortuary immediately. The mortician informed us that the sister-in-law and the medical surrogate had not asked any questions and that he had not gone out of his

way to call them and give them any information. As of that time, neither of them had inquired with the mortician about Mr. Cannon (and neither would do so until we left for Phoenix with Mr. Cannon's body). Our fears of a legal battle did not materialize.

Remote Whole Body Washout

The Remote Transport Team (Fred and Linda Chamberlain) arrived in Orlando, Florida at approximately 20:00 EST. The drive to Avon Park (inland) took approximately two hours. *En route* we used a cellular phone to apprise the mortician of our progress. After stopping to pick up ice and insulation for the shipping container, the team reached the mortuary at approximately 23:00 EST.

When we arrived, Mr. Cannon was on the table and ready. His face was very edematous and his tongue was protruding from his mouth, a condition considered to be normal after strangulation. His limbs were stiff and cold. Although asanguineous, the color of his tissues was normal.

At 23:19 EST, after a short discussion of procedures to be followed, Fred Chamberlain assisted the mortician in rinsing the mortuary pump with distilled water and loading the ViaSpan. Linda Chamberlain first packed additional ice around Mr. Cannon's head, then added medications (see Figure 1) to the ViaSpan while the embalmer cannulated the carotid artery and vein with metal embalming cannula. The washout began at 23:35 EST and was done with 20 liters of ViaSpan. The pressure from the mortuary pump was 2 psi throughout the procedure. Within two minutes the effluent had cleared remarkably (see Figure 2).

Figure 1: A-1069 ViaSpan Additives

Additive:	Packaged:	Add volume / liter of Viaspan:	per 15 liters
Heparin, 10,000 IU/l	40,000 IU/ml	1 ml	3.75 ml
Dexamethazone, 16 mg/l	4 mg/ml	4 ml	60 ml
Streptokinase, 250K IU	250 K IU reconstitute	250,000 IU	250,000 IU
Bactrim, 10 ml	10 ml		
Gentamycin, 80 mg	40 mg/ml		4 ml
Desferal, 2 gr	2 gr reconstitute	2 gr	2 gr

NOTE: Heparin, streptokinase, and dexamethasone go into the whole 15 liters. The remaining drugs go in the last part of washout/cool-down. As of May, 8 1996, we deleted Humulin and glucose, because under anoxic conditions the glucose produces lactic acid and reducing equivalents that are available for free radical formation.

Examination of the face and neck by the embalmer resulted in the opinion by same that washout was thor-

voir and have it diluted and washed away). Flow was terminated at 23:50 EST before the last of the ViaSpan

Cryoprotective Perfusion at Alcor Life Extension Foundation

Participants:

- Fred Chamberlain, Perfusionist
- Linda Chamberlain, Burr Hole
- Tony Cerrulo, Funeral Director
- Keith Henson, Surgeon
- Hugh Hixon, OR Assistant
- Judy Muhlestein, Blood Samples, Scribe
- Mike Perry, Administrative
- Brian Shock, Refractometry
- Mathew Sullivan, OR Assistant, Cephalic Isolation, Scribe
- Lisa Shock, Photographer, Scribe

The patient was picked up by the Alcor ambulance at Phoenix Sky Harbor Airport on 21 February 1997 at about 14:00 MST (40 hrs. post-pronouncement) and transported to the Alcor facility in Scottsdale. The patient's temperature upon arrival was 4°C. The appearance of his face and body remained unchanged from that described prior to washout. No fluid was leaking from body orifices. Below are significant points

**Figure 2:
A-1069 Washout Flow
and Pressure Rates**

Military Time EST	Resvr # liters	Flow Rate liters/min	Pressure psi
11:35:00	11.0		
11:40:00	10.5	1.4	2
11:40:05	9.6	1.5	2
11:41:00	9.0	1.1	2
11:41:05	8.5	1.1	2
11:42:00	7.9	0.9	2
11:42:05	7.6	1.2	2
11:43:00	6.7	1.4	2
11:43:05	6.2	1.0	2
11:44:00	5.7	1.2	2
11:44:05	5.0	0.7	2
11:45:00	4.3	1.1	2
11:45:05	3.9	1.1	2
11:46:00	3.2	1.3	2
11:46:05	2.6		

left the reservoir (to prevent bubbles from entering the cannula). The cannulae were left in place. The latex tubing connected to the cannulae was ligated and then cut.

The patient was transferred to a heavy-duty (8 mil) vinyl body bag. The body bag containing the patient was then placed atop a bed of zip-lock bags containing crushed ice which had been laid down inside an insulated air transport box (Zeigler case). The patient was then covered with additional

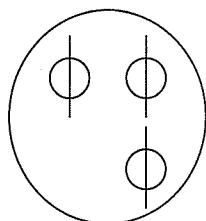
ough and distribution was complete. At 23:50 EST gentamycin was injected directly into the latex tubing immediately prior to the cannulated carotid to leave as much antibiotic in the vasculature as possible (rather than put it into the ViaSpan reser-

bags of crushed water ice and the transport container was wrapped in R-20 insulation and closed for air transport to Phoenix, Arizona. No commercial flights were available until the next morning. Air transport was uneventful.

in the cryopreservation of the patient.

15:00 MST Patient was moved into the Operating Room, laid on a bed of ice bags, re-packed with ice bags, and then prepared for cranial burr-holes by scrubbing with providone iodine solution and draping.

Note: Four burr holes were planned in an effort to see if a difference in brain areas could be detected due to a lack of perfusion through the vertebral vessels (only the carotids were cannulated). Lack of sufficient working space for retractors and other instruments on the coronal surface of the skull allowed only three burr holes. The following pattern was used:



15:15 Surgeon removed the autopsy suture, opened the chest, and removed the viscera. Pump tubing was connected to the mortician cannula, with care not to allow air in lines. (41.5 hrs. post-pronouncement.)

15:30 Surgeon noted a positive flow of perfusate through vasculature indicated by the rapid accumulation of effluent from carotid vein into body cavity.

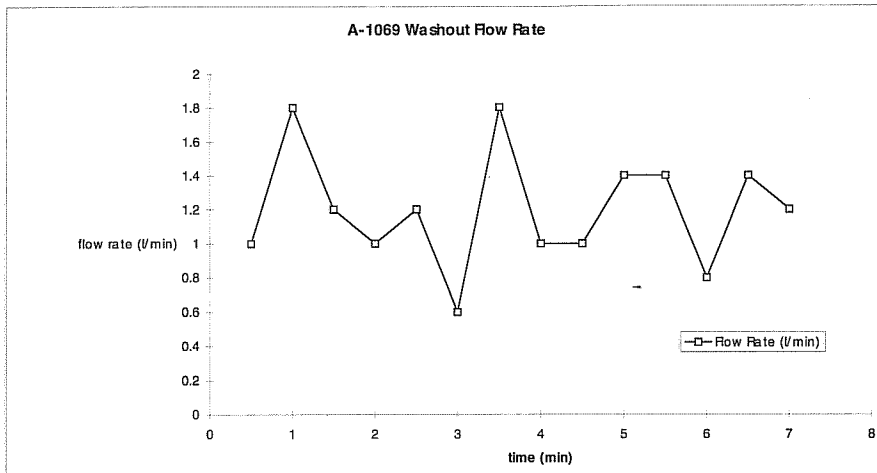
15:30 Brain tissue in upper right burr hole protruded slightly.

15:38 Lower burr hole produced outflow even before completion.

15:41 Upper left burr hole produced outflow immediately upon completion. Patient's throat had been dam-

aged from strangulation. Manipulation was tried in order to increase circulation.

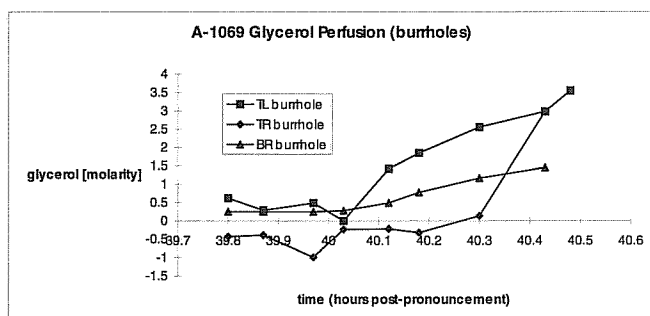
15:45 Burr hole technician discontinued efforts to clear meninges from surface of brain. After dura was punctured, anatomical differences



Graph 1

Time	Volume (liters)	time (min)	Flow Rate (l/min)	Pressure (psig)
39.5	11.0	0.0		
40.0	10.5	0.5	1.0	2
40.5	9.6	1.0	1.8	2
41.0	9.0	1.5	1.2	2
41.5	8.5	2.0	1.0	2
42.0	7.9	2.5	1.2	2
42.5	7.6	3.0	0.6	2
43.0	6.7	3.5	1.8	2
43.5	6.2	4.0	1.0	2
44.0	5.7	4.5	1.0	2
44.5	5.0	5.0	1.4	2
45.0	4.3	5.5	1.4	2
45.5	3.9	6.0	0.8	2
46.0	3.2	6.5	1.4	2
46.5	2.6	7.0	1.2	2

Graph 2



time (p-p)	Molarity		
	TL	TR	BR
39.80	0.62	-0.43	0.25
39.87	0.29	-0.39	0.25
39.97	0.49	-0.99	0.25
40.03	0	-0.23	0.28
40.12	1.42	-0.22	0.49
40.18	1.85	-0.32	0.78
40.30	2.56	0.14	1.17
40.43	2.98	2.98	1.45
40.48	3.55		

Figure 3: A-1069 Glycerol Perfusion (Burrholes)

CPA Concentration Log						
Time	Hrs Post	Sample	Arterial	Venous	Arterial	Venous
MST	Pronoun					
15:00	39.00					
15:29	39.48	4% Gly.	10.50		0.04	0.55
15:40	39.67	75% Gly.	65.20		0.75	10.27
15:48	39.80	TL	9.80		3.09	0.62
15:48		TR	5.00		-3.14	-0.43
15:48		B	8.80		1.79	0.25
15:52	39.87	TL	9.60		2.83	0.29
15:52		TR	5.20		-2.58	-0.39
15:52		B	8.80		1.79	0.25
15:58	39.97	TL	10.20		3.61	0.49
15:58		TR	5.20		-2.88	-0.99
15:58		B	8.80		1.79	0.25
16:02	40.03	TL	0-0		0-0	0-0
16:02		TR	6.10		-1.71	-0.23
16:02		B	9.00		2.05	0.28
16:07	40.12	TL	15.40		10.36	1.42
16:07		TR	6.20		-1.54	-0.22
16:07		B	10.20		3.61	0.49
16:11	40.18	TL	17.80		13.48	1.85
16:11		TR	5.60		-2.36	-0.32
16:11		B	11.80		5.69	0.78
16:13	40.22	Art. #1	36.60		37.88	5.90
16:17	40.28	Ven. #A	37.20		38.66	5.27
16:18	40.30	TL	21.80		18.67	2.56
16:18		TR	8.20		1.01	0.14
16:18		B	14.00		8.54	1.17
16:24	40.40	Ven. #B	27.40		25.94	3.55
16:25	40.42	Art. #2	44.20		47.74	6.54
16:26	40.47	TL	24.20		21.78	2.98
16:26		TR	9.80		3.09	2.98
16:26		B	15.60		10.62	1.45
16:29	40.48	TL	27.40		25.94	3.55
Perfusion Halted						

TL = Top Left Burr Hole
TR = Top Left Burr Hole

B = Bottom Burr Hole
0-0 = Insufficient Sample

between dura and brain surface were not clear enough to proceed without damaging the brain tissues.

15:46 Fluid sample were taken from burrs hole every 5 minutes from this point.

15:50 Brain swelled and protruded about 1 mm from both upper burr holes.

15:50 Perfusionist began ramp.

16:05 Edema in facial tissues became remarkably worse. Surgeon placed pressure line into infusion tube to increase the flow of glycerol in an attempt to bring down edema.

16:09 Pressure at 138 mm Hg and rising.

16:10 Pressure at 142 mm Hg and rising.

16:11 Brain in upper left burr hole

receded.

16:12 Patient's face turned orange in blotches, indicating lack of uniform glycerolization.

16:14 Surgeon noted difficulties due to autopsy procedure leaving the chest cavity useless.

16:16 Pressure at 179 mm Hg.

16:18 Brain surface protruded from both upper burr holes approximately

1 mm on each side.

16:28 Pressure at 180 mm Hg.

16:29 Brain surface protruded from both upper burr holes approximately 2 mm on each side. Decision is made to terminate perfusion. Pump was shut down.

16:30 Brain surface protruded from lower burr hole as well. This may indicate that there was perfusion of the lower portion (occipital region) of the brain even though the vertebral were not cannulated.

16:33 Temperature and crack phone probes could not be placed between skull and meninges due to swelling. Brown temperature probe and crackphone probes were placed under the scalp near the left lower burr hole.

16:38 Brain edema at left upper burr hole disappeared. Brain surface had actually sunken below skull about 1 mm. Brain in the right upper burr hole was flush with opening. The brain was still swollen and protruding from the lower burr hole.

17:00 Cephalic isolation; extreme edema noted in neck and face (but extreme edema was noted when the patient was examined before wash-out).

17:02 Cephalon was placed in silcool, and dry ice was added for temperature descent. (43 hrs. post-pronouncement.)

Summary of Cryoperfusion

Cryoprotective perfusion was started with 4% glycerol and ramped by mixing with 75% glycerol perfusate (see Figure 3). The damage to the thoracic and abdominopelvic cavities resulting from the autopsy made normal procedures impractical. It was not possible to take blood samples; no lab tests were run. Refractometry to determine glycerol concentration was done primarily on

the effluent from the burr holes.

The cerebral cortical surface was repeatedly examined during cryoprotective perfusion. Major edema of the cerebral cortex, as observed at the burr holes, and edema of the facial tissues forced termination of perfusion within 40 minutes of starting the cryoprotective ramp. Terminal glycerol concentrations were 3.55 Molar at the upper left burr hole, 0.42 Molar at the upper right burr hole, and 1.45 Molar at the lower burr hole. Perfusion was discontinued at 15:29 MST.

Cephalic Isolation

Burr hole closure was completed before cephalic isolation. The burr holes were filled with bone wax (with the thermocouple and crackphone probes in place) and the skin incisions over the burr-holes were sutured. All probes were secured with surgical staples to the skin of the patient's head. Surgery for cephalic isolation was begun immediately after burr hole closure.

The skin, cervical musculature, and spinal cord did not exhibit typical signs of thorough and uniform glycerolization (i.e., no dehydration, waxy texture, ambering of the skin and deepening of skeletal muscle color).

Cooldown

The patient (cephalon) was then placed in two 1 mil polyethylene bags with two thermocouple probes (probe #1 was pharyngeal and probe #3 was skull surface) and two crackphone probes protruding from the opening of the bag. Brain edema prevented the placement of probe #3 between the dura mater and the skull. It was instead placed between the scalp and the skull.

On February 21, 1997 at 17:08

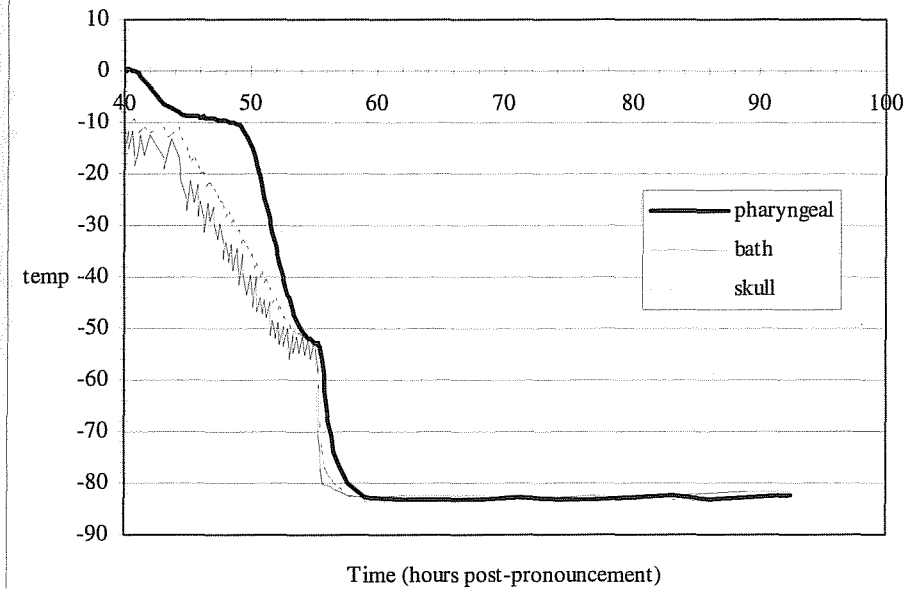
MST (40.13 hours post-pronouncement) the patient was submerged in a 15 liter Silcool bath which had been pre-cooled to -11°C . The final glycerol readings as determined by refractometry were erratic (the top right burr hole was 0.42 Molar, the top left burr hole was 2.98 Molar, and the bottom burr hole was 1.45 Molar; see Figure 3). For the purpose of determining the starting bath temperature, the glycerolization was considered to be spotty at best and so was estimated at less than 1 Molar. On this basis, the starting bath temperature was -11°C .

The first temperature readings after submersion in the Silcool were probe #1: pharyngeal, -0.3°C ; #2: bath, -11.0°C ; #3: between scalp and skull, -3.2°C . Because of problems with the thermocouple setup and calibration, it was deemed necessary to apply an offset to the recorded temperatures. Dry ice (-78.0°C) was read as -82.7°C , and liquid nitrogen (-195.8°C) was read as -197.2°C on the computerized Cooldown log.

The patient's cooling curve to dry ice temperature is shown in Graph 3. The computer-controlled temperature descent, proprietary to Alcor, was set to drop $4^{\circ}\text{C}/\text{hour}$, to move from -11.4°C to -50.0°C in 10 hours. At -52.9°C pharyngeal, controlled-rate cooling was terminated and the ice bath was filled with dry ice. The temperature descent to -78°C took place over a period of approximately 18.9 hours. (This data is based on the pharyngeal probe.)

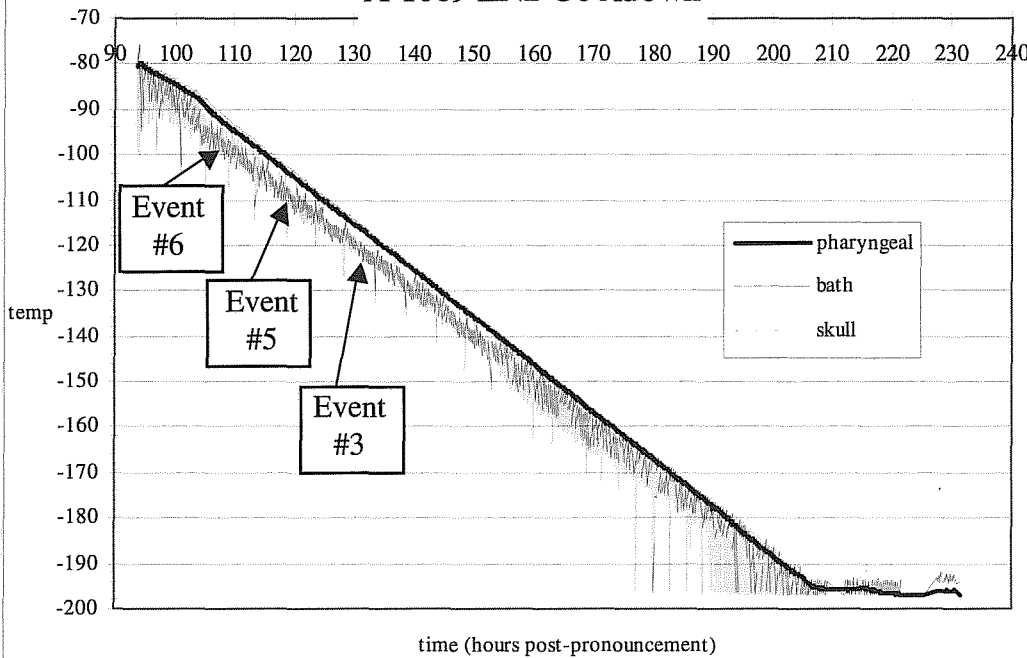
The patient's cooling curve to liquid nitrogen is shown in Graph 4. The bath probe was calibrated at liquid nitrogen temperature, and the other probes were matched to it at dry ice temperature. On February 23, 1997 at 22.55 MST (93.92 hours

A-1069 CO2 Cooldown



Graph 3

A-1069 LN2 Cooldown



Graph 4

post pronouncement) the computer-controlled temperature descent was set to drop 10 degrees in 10 hours from -78.9°C per hour. The crackphone was started at 23.13 MST (94.2 hours post pronouncement).

On February 24, 1997 at 10:12

MST (94.25 hours post pronouncement) the computer-controlled descent was set to drop $1^{\circ}\text{C}/\text{hour}$ from a temperature of -91.7°C . The temperature descent to -198.2°C (corrected value for LN_2 temperature) took place over a period of approximately 172 hours (seven days).

nel were present and the program was restarted immediately.

Crackphone Analysis

Three cracking events were observed for this Cooldown. Per our previous experience, this small number was typical for uncryoprotected

The scanning thermocouple on the crackphone was equipped with high and low alarms on each thermocouple channel, and the alarms were activated for the bath thermocouple to give an audible alarm if there was a temperature excursion outside the alarm limits. A high alarm meant that the bath was warming up (out of liquid nitrogen, program crash, etc.). A low alarm might mean a runaway cooling condition, but usually mean that cooling had advanced to the alarm limit, requiring that both low and high limits be set downward.

On February 28, 1997 at 23.53 MST (214.2 hours post-pronouncement) a high alarm alerted us that at -193.2°C bath temperature, an "out of memory error" had caused the computer program to crash. At 23:59 the computer was restarted at a temperature of -193.1°C . Another "out of memory error" caused a second program crash on March 1, 1997 at 12:41 MST (227.7 hours post pronouncement) at approximately -193.9°C . In both cases Cooldown personnel

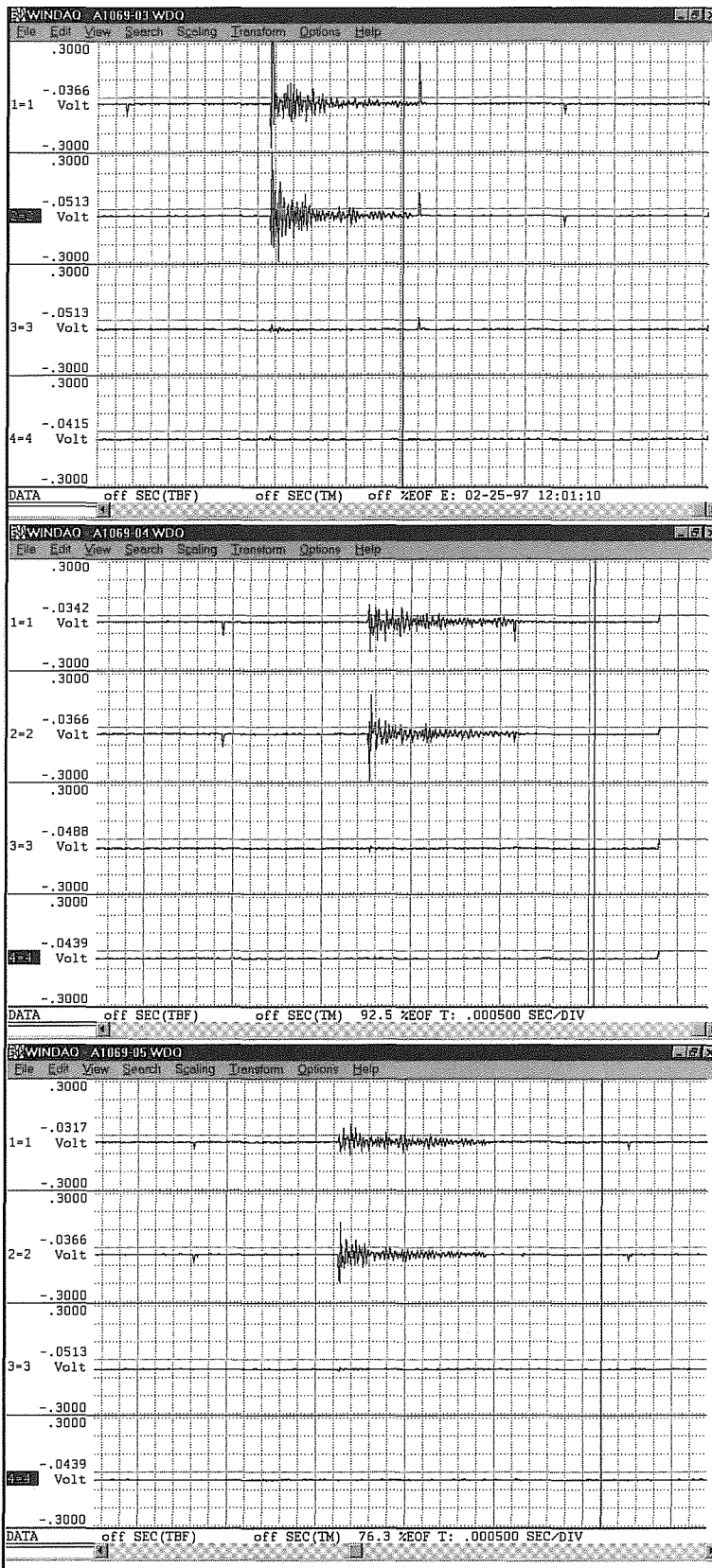


Figure 4: A-1069 Cracking Events

File Name	Event#	Date	Time	Corr.Temp.	Amplitude (v)
A1069-03.WDQ	6	2/25/97	05:22:01	-109.3	3.2v
A1069-04.WDQ	5	2/25/97	19:20:57	-123.0	0.4v
A1069-05.WDQ	3	2/26/97	07:15:47	-135.7	0.19v

patients. As mentioned above, the final glycerol readings as determined by refractometry were erratic.

Because of brain edema, crackphone elements could not be placed within the skull, and were instead placed adjacent to burr holes, next to the skull and under the skin, with the skin sutured. Acoustic coupling appeared to be good.

As mentioned above, due to problems with the thermocouple setup and calibration, it was necessary to apply an offset to the recorded temperatures. Dry ice (-78.0°C) was corrected to read as -82.7°C, and LN₂ (-195.8°C) was corrected to read as -198.2°C from the thermocouple. A new enclosure box for the crackphone front end reduced the number of spurious events significantly. With this reduction in noise, important events were easier to distinguish. A linear correction was applied to that data to get corrected temperatures for the cracking events. (Crack amplitudes are expressed as maximum observed voltage from the trace baseline.) Cracks were observed according to Figure 4 (with raw crackphone data for each event shown on the left side of this page).

Given the small number of events, not much can be said about patterns. As with the cracking report of Patient A-1110, all observed cracks occurred below -95°C and the descent amplitude implied some propagation pattern, rather than random events.





Depression, Suicide, and Cryonics

Several years ago I attended a cryonics conference both as an involved spectator and a participant on a panel addressing mental health issues for cryonicists. I used a few moments of my panel time to tell the audience that each and every one of them had my permanent, unqualified request and permission to physically interfere with any attempts I might ever make at suicide. (In retrospect, the only exception I want to make is in the circumstance of a proper medically assisted euthanasia as part of my cryonic suspension).

I recall that the discussion soon became heated. Several of the more vigorous libertarians took the position that no matter what the circumstances, they would never interfere with a person's right to control his own life course. Others argued that a drug- or depression-induced suicide attempt (for example) was a manifestation of severe illness, not free will, and no matter how eloquently persuasive the person might be, it was one's moral, if not loving obligation to interfere.

Personally, if it was someone I knew and cared about, and *particularly* in the case of a fellow cryonicist who had unfailingly stated his desire for the best shot at a "good" suspension, I would interfere and accept the consequences.

The point here is not to debate and analyze either position, or propose alternative philosophies for the potential rescuer. Rather, it is to remind each and every one of us (my-

self included) that we are all vulnerable to the horror of a lonely, self-inflicted death, rendering cryonic suspension an academic exercise instead of a chance at extended life.

This article was unfortunately prompted by Linda Chamberlain, who was at the time tearfully relating the story of long-time Alcor member Joe Cannon. Joe committed suicide and is now in suspension. It is a very sad story to all but the most hardened or egocentric persons, and even to them I say there is something here to be learned for yourself.

I have no direct personal knowledge of Mr. Cannon (or his wife Terry, currently an Alcor patient), but have learned a lot about him from a variety of verbal and written accounts. His story is one of a dedicated cryonicist with great vigor and love of life, who sank into a suicidal depression following a long and severe sequence of grave personal loss

(Terry); major illnesses (emphysema, a variety of cardiac problems including infarction and low output, stroke, and prostate cancer); medications with possible psychiatric side effects (including mood swings and loss of libido); loneliness; difficult financial straits; and virtually total loss of self worth as evidenced by his statement to the effect that, "My wife Terry will be able to find someone better than me in the future. She is better off without me."* Some of you might even remember Joe as the fellow who arranged to have an apnea monitor that was to signal an alert if he should die in his sleep.

Did someone try to intervene when Joe Cannon showed clear signs of suicidal intentions? Yes! Short of providing Joe with 24-hour monitoring or relocating him to Scottsdale, Alcor members and friends made several attempts to reverse the pattern he was sinking into,

Michael Riskin, Ph.D. is a clinical psychologist (specializing in sexual disorders), a CPA, and an Alcor Director.

* Quoted from the Discovery Channel special "Immortality on Ice," 1996.

obviously to no avail.

The medical and psychiatric aspects of suicidal depression are generally well known or easily found. The purpose of this piece is to help all of us develop greater understanding of suicide. That in turn can lead to an internal and external infrastructure that might kick into action before the point of no return — let alone the point of inevitability — is reached.

The peculiarity and seeming contradiction is that long-term cryonicists, who so greatly value their lives, as evidenced by deed, word, money, and contract, may be more subject to a fatal suicide than the general population. I use the phrase “fatal suicide” on purpose, even though it may seem redundant. Suicide is merely one form of creating the circumstance for a legal pronouncement of death, but a “fatal suicide” has the circumstance of creating such massive damage as to minimize if not eliminate the possibility of a successful suspension leading to an identity-based reanimation.

I make no claim to know what was in Joe’s mind or the mind of any cryonicist who commits suicide, but I do have an opinion. Why does a cryonicist want an extended life? Most simplistically, it is the conviction that in the long run, life offers an excess of pleasure as compared to the costs and pain of being alive. And even further, lacking a belief in any variation of hereafters, death means a permanent end to that pleasure/pain/cost equation. Yes, there are other fundamental reasons, such as the commonly held fear of death itself, and the intense repulsion (my own personal horror) of burial or

cremation.

The term “long run” as used above is of great significance. To the suicidal person, any thought of a possible pleasurable life in the “long run” is completely overwhelmed by the immediate prospect of ending current pain. For a great many people, the experience of “life’s pleasure” is not a string of positive feelings in an absolute sense, or even an excess of absolute pleasures over pain. Many such people say, “I feel good,” they are actually saying, “My pain has lessened or even better yet,

“The peculiarity and seeming contradiction is that long-term cryonicists, who so greatly value their lives, as evidenced by deed, word, money, and contract, may be more subject to a fatal suicide than the general population.”

stopped.” For them, “feeling good” is really “feeling continued but reduced anguish.” Most tragically, this is especially true with older persons, the most vulnerable of us. Perhaps the tendency is inherited; perhaps it is Nature’s way of saying, “Your species got what it needed from you, and now that you are old, infirm, and ‘useless,’ save everyone time, money, and trouble by killing yourself.”

Don’t give in! You decided not to give in when you signed up for suspension. Don’t let the bad guys get you now!

So, we have a cryonicist in pain, who has replaced his original belief that “life is essentially good” with a new belief that “the end of ones life has positive value.” He now desires eternal neutrality. In that situation,

suicide seems like a rational choice. Even more horribly, this suicidal ideation is addictive; it can become a sort of self-medication for life’s ills. I suspect (although I would need some help in scientifically demonstrating this) that the brain produces its own opiate-analog from such suicidal thoughts, much in the same manner that it produces dopamine in certain individuals who live on the “brink.” Once this chemical addiction joins forces with the emotional “pleasure drive” of suicide, the process becomes even more highly addictive, perhaps beyond the point of self control.

When faced with extended and grave illness, pain, alienation, poverty, deprivation, humiliation, failure, hopelessness, loss, and self worthlessness, it may be impossible to keep ones sights on the possibility of a better future. In fact, the elimination of one or more of the above agonies becomes a higher priority than a vague shot at a satisfactory extended life.

I have felt suicidal several times in my life, but have never acted on it in the sense that immediate death would be a possibility. Have any of you felt similarly?

The key to preventing suicide is to recognize external and internal warning signs. (By “suicide,” I mean behavior that could lead to a sudden, purposeful, self-inflicted death, as compared to, say, thirty years of smoking, or even the belief that simply signing up for cryonic suspension is enough.) Each warning sign has its own level of intensity, with the worst-case situation being multiple symptoms at high levels.

The following five co-existing conditions indicate a reason for immediate concern:

(The existence of even one or two of these should be taken very seriously.)

- 1. Has a plan for the suicide been formulated?**
- 2. Does the means easily exist to execute the plan?**
- 3. Has the person made written or verbal(direct or implied) warnings that a suicide is intended?**
- 4. Have there been prior unsuccessful attempts?**
- 5. Are there any of the internal or external symptoms listed below?**

In the absence of 1,2,3 above, the following may indicate a person getting close to or past the point of personal no return, meaning suicide is inevitable without outside intervention.

Externally, the potential suicide victim may exhibit:

- 1. Significant changes in food consumption, along with marked weight gain or loss.**
- 2. Apathy and indifference.**
- 3. Excessive sleep or insomnia.**
- 4. Lack of interest in any pleasures.**
- 5. Decreased libido.**
- 6. Use of drugs and alcohol.**
- 7. Inattention to personal habits and appearance.**
- 8. Mood swings.**
- 9. Wanting to be alone.**
- 10. Detachment from one's normal social or occupational activities.**
- 11. Non-compliance with medication(s).**

Internally, the potential suicide victim may feel:

- 1. Hopelessness.**
- 2. Sadness.**
- 3. Chronic physical pain**
- 4. Self-devaluation, worthlessness, and guilt.**
- 5. Absence of pleasure.**
- 6. Withheld anger.**
- 7. Mood swings.**
- 8. Lack of energy, chronic fatigue, and inability to focus or make decisions.**
- 9. Continual thoughts of death.**

It is important to note that there is a major difference between "feeling depressed" and the mental disorder of depression. Clinically depressed persons are in fact unable, by force of will or any other means, to raise themselves out of depression. Some specialists in this disorder claim that every severe depres-

sion is accompanied by biochemical changes in brain function.

Sometimes "agitated depression" occurs, in which the victim appears energetic but is actually severely depressed. When the mania or agitation ceases, the depression can then become profound. This is seen more commonly in children or adolescents

than in adults.

There are well-known factors that can contribute to a severe depression. They include, but are certainly not limited to, financial disaster or assuming large financial burden, chronic illness and pain, loss of loved one(s), humiliation, loss of status, change of status, and profound

personal failure. Most depressive reactions to those kinds of situations are transient but they need to be watched to see if they linger or intensify.

The problem with cryonicists is that our personal despair takes on an additional factor compared to the general population — the intense desire to live a pleasurable life “forever,” combined with the profound sadness that accompanies one’s realization of how hopeless current cryonics technology may really be, may become too much to bear. At least by killing oneself, the victim exhibits an ultimate personal control over an unavoidable destiny.

When the situation has not yet reached “911” stage, the potential suicide is easier to help, either through internal or external resources. It may take some simple, pointed observations and directions to reverse the situation. It may require medications prescribed by a physician. It may even have predominantly psychological roots, treatable by a psychotherapist. But that is one of life’s ironies; the “hungrier one is, the less likely he is to get fed,” or in this case, the worse the suicidal ideation, the more difficult it is to get compliance and a cure.

It is up to you, now, when you are emotionally healthy and on the right side of the suicide continuum, to make preparations. These preparations are internal and external. They are meant to simultaneously keep your life positively pleasurable (as an immunization against the known suicide “viruses”) as well as trigger predetermined mechanisms that will intercede should unpredictable circumstances raise the possibility of suicide. Think of this as a kind of emotional and environmen-

tal “standby readiness,” if you will.

We should all keep the phone number of our local 24-hour suicide prevention hotline readily available. Failing this, 911 can also be called. A good suicide-prevention technique for some might be to make devout promises with loved ones and friends, using eye contact and the LifePact figure-eight “eternity” handshake, that a suicide will not occur without verbal contact. Make public and written announcements to everyone it may apply, that any suicide attempt on your part is a manifestation of disease, not rational choice, and that anyone has permission to interfere with the process. [See the form “Personal Directive Regarding Terminal Medical Condition,” following this article; the form is also available from Alcor upon request — *ed.*] It has also been demonstrated that regular, vigorous exercise is extremely helpful both in preventing and fighting depression.

When dealing with a potential suicide, I believe in using any means available to anchor the person back to his personal life-drives, morals, or external commitments: manipulate him in any way possible, even through the use of physical force or intervention by emergency personnel; “steal” the means of suicide; help the person externalize buried rage (almost like a psychological Heimlich maneuver), if that is the situation. If you have never experienced suicidal depression, you may find it difficult to fully comprehend what the victim is going through, but that doesn’t mean you are unable to help. In fact, if you are able to get the person to explain his despair, you can turn your disadvantage into an advantage by displaying sincere interest in the victim’s

feelings. And yes, sometimes even a warm hug is enough to take the edge off suicidal feelings temporarily and buy some time.

The following are some of the most commonly held myths about suicide, as outlined in “Modern Synopsis of Comprehensive Textbook of Psychiatry”; Freedman, Kaplan, and Sadock.

Fable: People who talk about suicide do not do it.

Fact: 8 out of 10 suicides gave definite warnings.

Fable: Suicidal people are intent on dying.

Fact: Many if not most of these people seem to be undecided most of the time.

Fable: Improvement after an attempt means the risk is over.

Fact: Many suicides occur about three months after treatment starts, when the person has enough energy to put the thoughts into action.

Fable: Suicide is either more common among the rich, or the poor.

Fact: Suicide has equal representation across socio-economic lines.

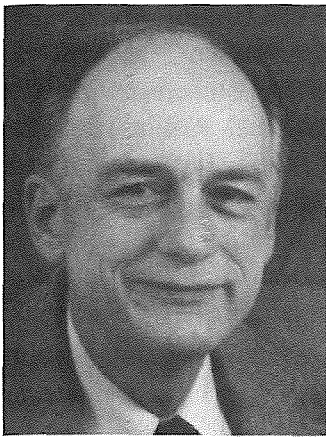
This article was not intended as a comprehensive treatment of suicidal depression, but only a starting point for discussion. It is now up to all of you to use this information as a catalyst for further learning, and to act appropriately as your own personal circumstances so dictate.

When I start to get down, I look at some words I wrote several years ago:

“The worst day alive is better than the best day dead.”

Any comments to myself or the editor, of a personal or professional nature, are eagerly encouraged.





Comments on Michael Riskin's "Depression, Suicide and Cryonics"

Thinking About Dying

In general, if suddenly faced with death, most people struggle to escape. When death comes creeping slowly upon us, sometimes it is different. If we are diagnosed with a fatal illness, writers like Kübler-Ross see us traversing various psychological states (such as denial and anger, then perhaps bargaining, resignation and acceptance.)

When people were interviewed as to the amount of time they "thought about" dying, the answers were definitely age-related. People in their 80's and 90's, on the average, spend a very large part of their time thinking about the fact that their lives are about to come to an end, while young people, by comparison, have an "immortality syndrome" (Who, *me?* I'm *never* going to die!)

Willfully Embracing Death

On the other hand, faced with an unbearable life, a person may choose to end it. This choice is, as Michael Riskin's article points out,

usually not reached in a consciously logical, deliberate manner. There may be a "reaching out," a warning, by the suicide prone person talking about taking his/her life. If such people acquire the actual means of taking their lives, this is a tangible step, and there may be abortive attempts at suicide. Michael has given us a penetrating look at what happens in a suicide, and ideas on how to deal with it. But are there special aspects which might be unique to life extensionists?

Suppose A Life Extensionist "Gives Up" On Life Extension?

Suicide, in the case of life extensionists, might partly include a "change of heart" about life extension being workable. This might not be a common occurrence, but preliminary statistics indicate that suicides by life extensionists may be more prevalent than for the population as a whole. We cannot ignore this as a possibility.

Think of the devastating effect of "giving up on life extension"! We grow up in a culture where the inevitability of death is accepted, where one is regarded as foolish to think otherwise. Then we take the position that the rest of the world is wrong, we challenge its beliefs through our actions, and commit ourselves to a goal which could solve one of the most fundamental dilemmas of existence.

If we then conclude that we were wrong and are doomed, this is a "step down" of the most profound kind. Hopes higher than most ever dare to hope are exchanged for a very different view: that our lives are soon to be meaningless, dusty pages in forgotten diaries and history books. Life extension is not something to be taken lightly. Giving it up is painful.

Why Would A Life Extensionist "Give Up"?

A life extensionist could become disillusioned with the technical rate of progress. There could be disappointments as to slow growth of public interest, lack of synergism among life extensionists, and organizational internal politics. There could have been expectations of meeting many

Fred Chamberlain, III is one of Alcor's founders, as well as its current president and CEO. He has been personally involved with cryonics and life extension since the early 1970's.

“like minded” people who would understand each other. The new cryonicists hopes to find a greater level of comradeship with “people who want to live on indefinitely.” A combination of disappointments about these things could lead to a deep state of disillusion about life extension, along with the feeling that, “It’s just not going to work!” The particular combination is probably not important. Fears of the “unworkability of life extension” could produce a far deeper depression over death than fears of death in non life-extensionists. These negative effects, along with other life-impacts, could combine to produce a state of despair which seems overwhelming. There could be a feeling of “better to have it over with and be done with.” It is the balance of all such forces of a negative kind, against those concerned with the value of life, which could determine if a “will to live” would prevail over a “will to die.”

The Mind’s “Inexorable Computer”

In weighing decisions, a subjective balancing act goes on in the mind. The way the scales tip may at times seem to conflict with all logic. Choices of action ignoring logic are frequently made, nonetheless. We can say that such choices are “emotional”, but that (in itself) explains nothing. Only if we know what emotion *is* can we make use of such a statement.

Marvin Minsky’s “The Society of Mind” presents a view of mental activity which elegantly accounts for “emotional decision making.” He shows that a summation of all the pros and cons, subjectively, is an automatic consequence of the way our minds perform. We may consciously outline the reasons we be-

lieve are relevant, and our mind independently produces a conclusion of its own, by a similar but invisible process.

When the two conclusions are in agreement, we say “we are comfortable” with a decision. When we are not comfortable, this is a result of conflict between the two decision making processes. Sometimes we tolerate the discomfort better than others. Sometimes we choose the “logical” (conscious thinking) over the “emotional” (subjective summation) decision. Other times, many times, we rely on the emotional answers, renaming them as “common sense”, or “experience”, “hunch”, or simply “gut feel.” We construct elaborate arguments to support our emotions. (Also known as “developing rationale for our conclusions.”)

The Choice To Live Or Die

If answers from these alternative decision making processes diverge sufficiently, mental dissonance results. If surface logic suggests that staying alive makes sense, but a sub-surface summation process tells us that this is futile, then the final decision is in a state of dispute, in our own minds.

Suppose we hold in our hand a revolver, with its barrel pointed at our temple, and we toy with the trigger; two different decision making processes are struggling for control. One may tell us that what we are doing is stupid and illogical. The other may say that the discomfort, the dissonance, the further weathering of storms, is unbearable. The logical answer gives us mental satisfaction; the emotional answer, we feel, can give us comfort. If the discomfort becomes too great, we may choose the comfort.

What To Do?

We cannot always solve these problems within ourselves. We may need, as Michael Riskin suggests, the aid of others. If we fall into a state of deep depression, where our overall valuation is that nonexistence would be an improvement over our current circumstances, we need to be told that we must hang on; we need to be reassured of our worth, of the prospect that the pain will pass, and that the world will brighten.

Reviewing all the values our lives have held, and might hold, could help. The LifePact video interview process (*The Alcor Phoenix*, June 1997) might contribute to that. Natasha More’s “Cryo-Ally” networking proposal, in the same issue of *The Phoenix*, might also play a very important part. You might also consider executing a **Personal Directive Regarding Terminal Medical Conditions**, created by Linda Chamberlain (page 31 of this issue), or use this document as a template for your own directive.

Extropianism

Finally, we must have a firm picture of the alternative we face, in choosing between life and death. If we choose death, we choose to vanish. If we choose life, we choose to “go on.”

By going on, there is a chance to escape pain and experience joy. By choosing death, all we do is escape the pain. Choose life! Reach for Joy! Hang on! The Best is Yet to Be!

The Extropian point of view, since it is so focused on positives such as these, can help to keep us on track. This is not the whole answer, to be sure, but it is probably way ahead of whatever is in second place!





Personal Directive Regarding Terminal Medical Condition

I, _____, make the following statement and request pursuant to making arrangements to be placed into cryonic suspension, paperwork dated: _____.

The relationship between physical illness and suicide has been well documented [Douglas Berger, MD, "Suicide risk in the general hospital", Psychiatry and Clinical Neurosciences (1995), 49, Suppl. 1, S85-89]. As I have chosen to be frozen when I reach a state of legal and clinical death, I am therefore concerned that my own mental state could be affected by my terminal illness in such a manner that I would either become suicidal or lose my desire to live, and hence my desire to be frozen.

While I am healthy and of sound mind, I wish to make the statement that should I become terminally ill and decide to cancel my cryonics arrangements, I want my medical surrogate or other decision makers to consider such a change of mind to be invalid due to the depression caused by my terminal state. While in good health and sound mind, I firmly direct others to discount any desire to terminate my cryonics arrangements. I do not want my decision to be frozen to be compromised by my own maladjusted biochemistry, diseased physiology, or temporary mental illness.

Signed: _____ Dated: _____

Witnessed by: _____ Dated: _____

Witnessed by: _____ Dated: _____

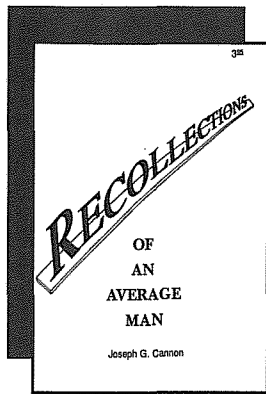
Affirmation:

On this date, _____, I, _____, affirm that I have re-read the above statement and directive and that I am still totally in agreement with this Directive.

Signed: _____ Dated: _____

Witnessed by: _____ Dated: _____

Witnessed by: _____ Dated: _____



Recollections of an Average Man

Joe Cannon was, as the cliché goes, a “character,” and no doubt he would’ve been the first to inform you of this. In 1989 Joe wrote and privately published a booklet of ideas, impressions, and anecdotes, which he modestly titled “Recollections of an Average Man.” The following are just a few sections copied directly from this work. As much as I might have wanted to tweak Joe’s grammar and word usage, I restrained myself; when Joe Cannon had an opinion, he rarely failed to express it, and afterward never regretted doing so. --ed.

When I was released from the navy after WWII, I returned to my home town and reopened my office as a consulting engineer. Along with my business phone’s alphabetical listing in the directory, a single line yellow page listing was included.

I was in no position to sit back and wait for the phone to ring, so I busied myself with three or four other small business endeavors.

It was four or five years later when my office phone rang. The caller was a woman employee of the company that solicits yellow page advertising in behalf of the phone company.

She verified the correctness of my listing and then suggested the advisability of my contracting for a larger sized ad to bring in more business.

I probably spoiled her day by replying that rather than increasing the ad size, I was inclined to terminate it entirely. She replied I couldn’t do that — what would happen to my business?

She probably didn’t believe it when I replied that I thought I could do just about as well without any ad

because in all the years I had had my business phone, I had received only one call.

That one call had been from a farm wife who lived in a small farming community nearby. She called to ask if I could design and build a barn manure cleaner for less than she could buy one from Sears.

Whenever I am asked the nature of my occupation, I often reply I am a consulting engineer, and a rather unusual one, for I am probably the only consulting engineer in the country who no one has ever bothered to consult.

The statement is usually good for a chuckle, and while not totally true, it’s not far from correct. One shouldn’t be censored for spoiling a good quip just because of one solitary phone call.

One of my good-work efforts in life had been to help pioneer a concept called “Cryonics” which is freezing at death with hope of future reanimation when medical expertise may increase to a sufficient degree to make it possible. As I write

this, my wife is one of the very few persons in the entire world who is so preserved.

In any event, back in 1967 the concept was new and very popular for discussions on radio and TV talk shows. I was invited to be on a TV program in Windsor, Canada. The host was the equivalent of Canada’s Johnny Carson. It was an afternoon show and was broadcast direct with no time delay tape.

The host and I had talked briefly before we went on the air. I had explained, among other things, how frozen persons were stored. It was in the early days of the concept and storage vessels were single body containers.

When we were on the air the host said as he understood it, I loved my wife very much and was interested in the concept because it might provide many additional years of companionship with her at a later date. I replied this was true. He next said as he understood it, the storage capsules were for only one person. He then asked if I enjoyed her companionship so much now, and looked forward to a possible continuation

of it in the distant future, didn't I think it would be nice to have a storage capsule for two persons so I could be with her during the interim period?

Now, I am not a fast thinker, but for at least once in my life I had a quick comeback. I replied that while I did enjoy my wife's companionship now, and surely would when possibly reanimated in the future, I couldn't care less about a frigid wife during the interim period in the freezer.

My remark broke up the entire TV crew and the laughs went out all over that part of Canada.

One summer while operating my discount business in Wisconsin, I bought too many Fourth of July sparklers and had a large number left over. There was nothing to do but put them away in the warehouse and sell them the next year.

However, while checking stock in the warehouse before Christmas, I noticed the sparklers and happened to recall Christmas and New Year's Eve in the south are celebrated with fireworks.

Being an ingenious fellow, I put a large display of my leftover sparklers in a prominent display location in the store and put a large sign on it suggesting customers buy their supply of Christmas sparklers.

Now the good folks of Wisconsin were not acquainted with this, and as they asked about it, I explained how pretty the sparklers would be against the snow. The sparklers began to sell and I sold all I had before Christmas arrived.

I was so busy with the Christmas rush, I had no chance to actually see what a sparkler looked like against a snow background. Evi-

dently it didn't set the world on fire as I had no calls for Christmas sparklers the next Christmas and haven't had any since. But I surely did get rid of my leftover sparklers and it seemed they should have been attractive.

Well, I get lots of ideas. Most of them don't amount to much, but that one did — at least for one year.

After thirty nine years of wonderful married life my wife died in 1985. However, prior to her death, she had arranged to be a whole body donor for cryobiological research, i.e., to be frozen at death with hope of eventual reanimation at some time in the future when medical science might develop the expertise to make that hope a reality.

She loved to travel and see new sights and did as much of it as was possible on our limited finances. I was thinking about her a few days prior to her birthday and thought of a wonderful birthday present she'd be sure to enjoy if she is ever reanimated in the future.

For a number of years we dealt with a travel agency doing business as "Creative Group, Inc." So on my wife's birthday, I visited the agency and a very pleasant woman agent asked how she might be of help.

I told her my annual purchase of a round trip ticket to Florida was a rather mundane transaction for a travel agency of her firm's name, but today I wanted to arrange a trip for my wife that befit her agency. When she asked what I had in mind I told her about my wife, it being her birthday, and as a birthday present, my wanting to make a down payment for a trip for her at some-time in the future. She asked what I had in mind and I replied I wanted

to arrange passage for my wife on the first civilian flight to the planet Mars.

She asked if I was serious. I assured her I was. She produced a gift certificate, filled it in and gave me a receipt for my down payment.

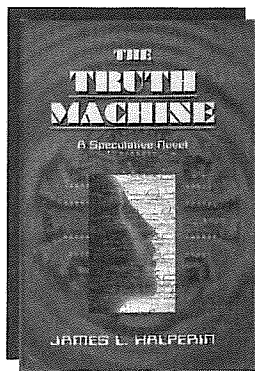
Oddly enough, it was only a few months later when I heard the news that NASA was starting to plan the details for a military flight to Mars. I assume a civilian flight will not be many decades later. Regretfully, I don't think there is any possibility of my wife being reanimated by then. She'll just have to take a later flight. But I know my wife and she won't be very happy about missing the first flight.

ABOUT THE AUTHOR

[*Joe Cannon's description of himself. -- ed.*]

Born in 1915, he graduated as an engineer and became a licensed consulting engineer in the early 1940's. Always a bit of a maverick, he preferred his independence to regular employment at higher remuneration. As an entrepreneur, he established an engineering office and at various times operated a commercial printing service, electroplating plant, engraving shop, and single handedly constructed houses, apartments, and commercial buildings. In 1958 he became one of the earliest discount store operators in the midwest. Although other engineers chided him about perpetual motion, he invented and holds a patent on an unique automatic flush valve. He also holds copyrights on several musical compositions for which he wrote both music and lyrics.





The Truth Machine

Chapter 23 "Cryonics"

Washington DC

June 15, 2015 — Vladimir Borovski becomes the first human to set foot on Mars. The crew of two Americans, two Russians, and two Chinese cut a deck of cards for the honor of being the first to exit the spaceship, and Borovsky drew the high card. As expected, there are no signs of life noted on the red planet's surface. — President Roswell signs S. 1122, the Cryonic Regulations Bill, into law, making the United States the first nation to legalize cryonic suspension of terminally ill humans. At least 300,000 Americans are expected to apply for freezing during the first 12 months. — In response to U.S. legislation, the pope issues a statement denouncing the practice of cryonics: "Life and death are matters that should be determined only by God." — The Unitarian Universalist Association, headquartered in Boston, publishes an official announcement that reads, in part, "Since there are varying opinions on the nature of the human soul, we believe cryonics is a personal decision best left to each individual."

2009

I won't speculate how the U.S. Cryonic Regulations would have been written had the Democrats controlled Congress that year, or if the President had been someone other than Garrison Roswell. The best word to describe how they did turn out would be "pragmatic." The second most descriptive word might be "mercenary." They offered a particularly profitable arrangement for the United States government.

On the day the Cryonic Regulations became law, popular evangelist Reverend Charley Bleacher declared on national media feed, "The field of cryonics ignores the fact that human beings are more than mere bodies. Indeed, we are immortal souls who happen to *inhabit* bodies. What do they suppose will become of our souls while those bodies are on ice? Maybe we won't just sit on a cloud somewhere for 30 or 40 years. We might all grab other bodies and enjoy another lifetime. Those

scientists could end up thawing out a million pieces of meat with the souls of a million pot roasts."

Politicians were more practical. If people wanted to try for a longer life (or immortality) here on earth, legislators weren't about to ignore them. When asked to remark on Bleacher's assertion, Senator Jimmy Hayes (R.LA) replied, "Everybody knows church attendance is down. I'm a religious man myself, but with all due respect, I suspect *some* men of the cloth are more interested in media exposure than in our immortal souls."

Texas Attorney General David West commented, "Cryonics has no more to do with God than a kidney transplant or an artificial heart. Suspension should be a personal choice, pure and simple. Nobody *has* to get frozen unless he or she believes it's appropriate. I don't see why cryonics is so different from any other form of medical treatment."

The technical aspects of thawing weren't perfected, but by 2015 many believed that those problems would eventually be solved. Anyone nearing the end of life had little to lose and everything to gain by being frozen. The demand for cryonic freezing was enormous.

Before the Cryonics Regulations, there had been obstacles that in retrospect seem utterly illogical. Suspended patients' wishes were often ignored; since suspendees were technically considered dead, they had no legal rights. Family members, their motives usually pure but occasionally sinister, often demanded that "the deceased" receive "proper Christian burials," rather than the suspension they would have preferred. Costs were exorbitant because of liability insurance and legal expenses (and until assisted suicide became legal in 2003, the inconvenience of waiting until the pa-

tient was legally dead). Local government red-tape was burdensome and inconsistently applied. Occasionally, autopsies were performed prior to freezing, even without evidence of foul-play. Worse yet, suspension often came too late, after much information in the brain was destroyed by trauma or disease.

After legalization, experts estimated the cost to cryonically freeze one average-sized adult would fall to \$3800; because of economies of scale this was less than 15 percent of the average pre-legalization price. It would also cost roughly \$800 per year to maintain proper conditions with absolute safety. Allowing for extensive record-keeping and a 50-percent profit for the facilities, insurance companies would underwrite "guaranteed-indefinite cryonic suspension" for a nominal monthly fee based on age, or for a one-time charge of about \$34,000 per person, about the same as the average funeral. Almost anyone could afford it.

Once S. 1122 became law, most funeral homes prepared to convert all or part of their operations into cryonic facilities.

Prior to the 21st century, there had been fears that the planet could not sustain major increases in population. As recently as the 1980s food and energy were in short supply, but both had become more plentiful and less expensive owing to improvements in science and transportation. By now it seemed the earth's resources could be leveraged through technology; in a sound world economy, at least 18 billion humans could survive comfortably.

Also, although ecological issues continued to loom, new technologies had already made considerable progress in the battle against water

and air pollution, ozone depletion, and global warming. And policies enacted during the Gore administration had demonstrated that effective regulation and enforcement were much better friends to the environment than population limits could ever be.

The remaining issues were largely economic and therefore political: What would happen to a person's estate during cryonic suspended animation? Federal and state governments relied on inheritance tax revenue. The governments would lose that revenue, yet be forced to regulate and inspect cryonic facilities for safety—an expensive proposition. Furthermore, if and when they were finally revived, could suspendees support themselves without government financial assistance?

S. 1122 turned cryonic suspension into a government profit center. United States citizens wishing to enter cryonic suspension were required to convert their net worths into cash on deposit with the federal government, to be repaid in inflation-adjusted dollars upon revivification. There were legal alternatives, but few were appealing.

(Note: A brief description of those alternatives may be found in the Appendix.-22g CP)

Since inflation averaged four

percent below Treasury's borrowing costs, eliminating the \$6.2 trillion national debt would save the government \$250 billion per year.

The U.S. government set up the Cryonic Reinsurance Agency (CRA) to regulate and guarantee performance of cryonic-insurers, so that suspendees would never be prematurely thawed because of the simultaneous insolvency of their cryonic suspension facility and private insurer.

Wealthy foreigners were permitted to enter the United States for suspension, but only if they deposited at least \$900,000, a bonanza for government coffers. This policy soon forced every other nation to enact similar government-guaranteed safeguards to persuade its citizens and their wealth from emigrating to America.

David and Diana stood directly behind President Roswell in the Oval office on the day he signed S. 1122 into law. Although delighted that cryonics would finally be legalized, David had really come to Washington to gather support for his as-yet unannounced candidacy for United States Senator in the 2016 elections.

Diana, now a professor at SMU, combined the trip with a book-signing tour. Her *Goals and Principles*

Jim Halperin's novel "The Truth Machine" presents detailed, well researched speculation about events and issues that may become important to us within the next 50 years. Whatever your views on objective "truth," you will find this story a fascinating exercise. "The Truth Machine" (ISBN #0-345-41056-4) is published by Ballantine and should be available in hardcover at all leading bookstores. Look for the paperback version in July, 1997.

Although cryonics plays only a peripheral role in this current novel, Jim's next work, "The First Immortal," explores the subject in detail.

of a *World Government*, which she had dedicated to the memory of Justin West, was selling well to college students and other academics. But she hoped it would catch on among politicians and bureaucrats in Washington. Telegenic and comfortable in front of a camera, Diana did not hesitate to use her celebrity to promote the book or the concepts espoused therein.

Since its publication, she had appeared on nearly every major talk show in America, including David Letterman's long-running "Late Show," during its final week prior to his retirement. The night she appeared, the show received the highest rating in its history, probably because of the appearance of former football star, actor, and famous murder defendant O.J. Simpson, rather than Diana.

Alluding to Simpson's controversial double-murder trial in 1995, Letterman asked, "O.J., when the Truth Machine finally gets approved, will you take a test?"

Simpson smiled and answered without hesitation, "Absolutely, Dave. And I hope they finish it soon, so I can finally prove once and for all that I'm an innocent man."

Diana got several minutes of air time; enough to explain her views to Letterman and his enormous viewing audience.

"I've spent the last two years talking to top experts on world poli-

tics. The consensus is that gradual introduction of a worldwide government is the best way to assure our survival. Even with a Truth Machine, which should be a reality in 5 to 10 years, how can laws be enforced by hundreds of autonomous governments? Although crime is decreasing in the United States, the world's getting smaller every day. Criminals of all descriptions use technology for their own ends, then use their knowledge of the law and extradition policies of various nations to escape the consequences.

"The important question to ask yourself is this: how many decades will it be before *individual criminals* have the ability to eliminate all life on the planet?"

Letterman listened politely. He played it straight, which lent gravity to Diana's views.

"World leaders, especially dictators, will be loath to cede power to any world body," she continued. "But a gradual introduction of international oversight, culminating in a World Government with authority similar to the United States federal government over individual states, is the only model that makes sense in the long run. It will be much easier to persuade world leaders to relinquish power over say, 20 to 30 years, than to expect them to do it all at once."

It was hard, Diana conceded, to imagine American voters today em-

bracing the concept of people in Rwanda or Pakistan voting on issues that affected Americans. "But by the time World Government exists," she told Stone Phillips on the "Today Show," "Ninety percent of voters in the world will speak fluent English. A person will be able to fly anywhere on the planet in less than two hours. Everyone will be able to access television and radio broadcasts, electronic newspapers, and computer network media from any country, instantaneously translated into English or any language of their choosing. In 20 years, the entire world will seem smaller and more homogenous than the United States does today."

Despite the compelling arguments in *Goals and Principles of a World Government*, the concept didn't catch on right away. Diana expected that, but had confidence in her theories. Her strategy was to open the plan to debate and try to make the idea seem as unthreatening as possible. Diana believed that future news events throughout the world would inevitably demonstrate the need for World Government.

Unfortunately she wouldn't have to wait very long.



"Appendix.-22g: Legal Alternatives for Cryonic Suspendees"

To avoid depositing funds with the government, you could assign money to relatives or friends, who'd pay taxes on such gifts and who might not be around when you were ultimately revived. Or you could deposit the money in a government-insured bank account, but all interest earned would be assessed at up to a 40-percent maximum tax rate. You could also lend money interest-free to a tax-exempt charity, but if the loan was ever repaid it would retain a fraction of its original purchasing power. Or, in perhaps the best alternative, if you had art, antiques, jewelry, rare stamps or coins, or other valuables, you could lend them to a non-profit museum to be returned if and when you were revived.



Of Black Swans and Neural Nets

Anyone who has read only a little philosophy will find the black swan story almost trite. It seems that before biologists went to Australia, they considered the color white to be a *defining characteristic* of swans. Not long after landing in Australia, however, they noticed some very black but swanlike birds. Without a thought for definitions, they named them at once: black swans. (Some black swans have now come to the U.S. and can be seen in parks here with their white kin).

This story actually tells us a good deal about how our minds work. We do not operate on the basis of definitions, nor do we simply perform logic on definitions once formulated. We apply our words (and with them, our thinking) using different circuits entirely. As time has passed, the importance of neural nets, even the artificial electronic kind, has slowly come to be seen for many applications. Our brains contain their own kind of neural nets, operating by principles which don't match those of electronic ones. But both artificial and natural nets share one ma-

major feature: unlike conventional programs in conventional computers, neural nets can accomplish tasks such as recognition. The word "swan," as actually used by these apocryphal biologists, did not follow its official "definition" at all. Instead, it referred to a large class of possible traits, not all of which need be present, with a very fuzzy relationship to one another. When we recognize someone's handwriting, we work the same way; we may never have seen exactly this written passage, and may not even understand it, but we can identify an author's familiar traces.

This ability now shows up in electronic devices able to recognize spoken English words and other such fuzzy patterns. The complexity of the tasks affects the size of the neural net, how it's implemented, and its cost. A variety of electronic neural nets have been proposed and are now in use. Neural nets can also be produced by a program on a "normal" PC, if the number of nodes is small enough. Still, every node in a neural net acts as its own small pro-

cessor, so that if you want a neural net capable of any complex recognition task, you will need many nodes in a special kind of parallel computer.

Yet in one critical way neural nets are *not* like computers, and much more like animal or human brains: you cannot *program* a neural net, but only *train* it*. In this sense, some (among them, Webster's dictionary) would argue that neural nets aren't computers. The important point here is how they work, not what we call them.

The different varieties of neural net each use different systems for learning. If you wanted to simulate a neural net, your program would not simulate what it had learned but instead simulate the system for learn-

* Yes, if we construct an identical electronic neural net, and find the weights given by each node to each connection in the original, we can make the new one act just like the old one. Shall we call the act of doing so "programming the net?"

ing. In directly constructed neural nets, that system comes not from any program but from the connectivity and construction of its nodes — one more way in which they resemble our brains.

The structure and behavior of our brains' biological neural nets still needs more research, but is now unquestionable that we use such systems. What does that tell us?

1. I shall state here, for clarity, that I myself would not call any kind of neural net a "computer." Sure, we can attach them to our computers and so make our computers more capable, but we can also enhance our computers with speakers, CD-ROMS, modems, disk drives, and uncounted other devices which no one would claim are computers themselves.

I'm not saying that we cannot make thinking machines like us, just that if we do so, they will not be computers.

2. Well, if you insist, you may call such devices "computers." Or you may even propose that a very large computer simulate your own neural nets (though that seems a very uneconomical way to proceed, no matter how powerful the computer; why not use that power to make the neural nets directly?).

However, the sense in which we could be "uploaded into a computer" starts to become very fuzzy itself. Of course, before we do any such thing, we must first understand very thoroughly the operation of each node (otherwise called a *neuron*) and its connectivity (by all the chemical and electrical means through which neurons affect one another). Otherwise, the simulation will fail, probably quite grossly.

3. For reasons I've never understood, some cryonicists believe that computers are superior to "meat," i.e. organic brains. Yet this humble meat does things that our most powerful normal computers cannot imitate. Even our electronic neural nets lack the connectivity of our brains (or that of reptiles' brains), and therefore are now only limited shadows of our biological nets. While that lack can someday be remedied, it's far from the only deficiency.

It's also quite unfair here to compare hypothetical devices with brains. What keeps us from improving our brains just as much as we improve our devices? For instance, we evolved in a situation where our speed of neural processing was optimal. If that optimal speed has increased, then nothing in biotechnology prevents us from speeding up our neural processing. Anyone wanting to argue the merits of metal versus meat must address this issue, too — and be knowledgeable about what biotechnology might accomplish.

4. And now one *fundamental issue* to understanding how we work, how we may someday change ourselves, and just what kind of future we may someday see: neural nets do not operate *rationally*, using no logic at all in their learning or their operation. Since our own unconscious thinking involves the workings of many different neural nets, we too do not operate "rationally." This is *not* a bad thing. If we were to work rationally, just like computers, then we could not do many of the things we now do much better than any computers. Our biologists would have decided that the black swans weren't really swans, and our understanding of living things would be quite

faulty: a serious problem, since we are living things ourselves.

Beneath every word in our language, beneath every thought and theory, lie these same fuzzy structures that cannot be put into words and that change whenever we touch them. When we learn some new fact or see some new thing, we learn not just about the world around us but something about ourselves too: our possibly false assumptions, our missing connections, our personal versions of the black swan.

If you think cryonicists will revive into a world where everything is known, remember the black swan. If you think we can somehow turn the universe itself into some kind of perfectly understood virtual reality, remember the black swan. At present, like children in a new playground, humans have found the power of the machines they can create. Delighting in this power, they think that their machines can do everything. Yet the very notion of a "machine" is now changing underneath us. The "machines" used for revival of cryonics patients will not resemble anything we would now call a "machine," nano or otherwise. The world of the future will not contain machines or computers in the sense we now understand.

We'll have no trouble dealing with this. Despite all the definitions in all the books, we too can recognize black swans.



Host

by Peter James, Villard Books (Random House), 1995.

Reviewed by Steve Bridge

Brian Shock once pointed out the monotony of most “cryonics fiction.” All too often the pattern is: guy dies — guy floats to wakefulness — guy discovers he’s been frozen and revived. Then the story lurches off to some unremarkable plot. That’s why we have been excited by the very few authors to employ some imagination on the theme, in particular Sterling Blake in “Chiller” and Linda Nagata in “Tech-Heaven.” (Both are still available in paperback from Alcor.)

While Peter James’s 1995 novel “Host” does not have as original a perspective as the two novels above, it does have some things to recommend it to many cryonicists. To give it a Hollywood hook, James’s story might be described as a combination of cryonics, uploading, and “Fatal Attraction.”

Joe Messenger is a world-famous artificial intelligence expert. Using a combination of machinery and human neurons, he has recently designed and built ARCHIVE, a computer which seems to be learning at a rapid rate. On its own, ARCHIVE has hacked into hundreds of computer systems to supplement its edu-

cation. Joe is also a cryonicist whose father was frozen (and tragically thawed by a corrupt organization).

Unfortunately, Joe, though married with a son, has a weakness for sex with beautiful computer geniuses, especially ones interested in cryonics, artificial intelligence, and uploading human minds into computers. Fortunately for him, there’s only one woman like that — Juliet Spring. Unfortunately, she knows she could die at any time from an inoperable brain aneurysm, and she’s got these possessive/vengeful urges about Joe.

Fortunately, just before her aneurysm bursts, she invents a way to upload her mind into ARCHIVE (without Joe’s knowledge). And fortunately, she is also a cryonicist, so Joe helps with her suspension.

Or maybe that should be “unfortunately,” too. Through a somewhat clumsy combination of unlikely accidents and legal decisions, Juliet’s suspension is compromised, and her body is cremated. Joe himself causes the final accident which results in the destruction of her brain. Of course Juliet still exists inside ARCHIVE. But it seems that Juliet

isn’t nearly as excited about being a computer mind as she thought she would be, and her thoughts (or “feelings?” inside a computer?) about the end of her biological self aren’t too pretty. In fact... Well, a Hollywood approach would probably say it best: “She’s beautiful, she’s twice dead, and she’s really *pissed off*.”

While this idea may sound a bit hackneyed to many of our readers, it’s probably brand new to the mainstream thriller audience out there (this was *not* marketed as science fiction). Certainly the combination of cryonics, uploading, and sex is new to cryonics fiction. James tells a pretty good story, with plenty of murder and suspense. He also took a lot of trouble to get most of the cryonics and uploading explanation right (except where it was inconvenient for the plot); and many of you will enjoy seeing how he uses the technology to generate literary chills as well as physical ones.



N F R
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Chemistry Imagined: Reflections on Science
 by Roald Hoffmann and Vivian Torrence, Smithsonian Institution, 1993

*Our Molecular Nature:
 The Body's Motors, Machines, and Messages*
 by David Goodsell, Copernicus (Springer-Verlag) 1996

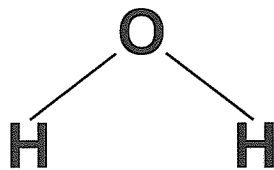
Reviewed by Thomas Donaldson, Ph.D.

Many people know virtually nothing about chemistry or biochemistry. Unfortunately, this lack of knowledge also occurs among cryonicists. Some of us may have gone so far as to recognize our ignorance and done some reading in textbooks, but reading textbooks may seem dry and forbidding. Further, textbooks tell us both more and less than we want to know: more, because we don't intend to actually do much chemistry or biochemistry; less, because we want some kind of broad idea of just what chemistry might do for us, and it's hard to get that from a detailed discussion of such topics as glycolysis.

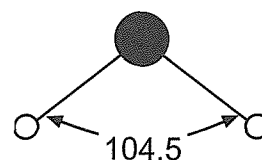
Some cryonicists may have also decided that they need not bother with either chemistry or biochemistry. I can only point out the old notion that ignorance has two forms, of which the last is worst of all: you may not know something and know it, or you may not know something because you believe otherwise and your belief is false. We are molecular machines. Any nanotechnological device will also be a molecular machine, and it is *chemistry* that limits just how any molecular machine may

be assembled.

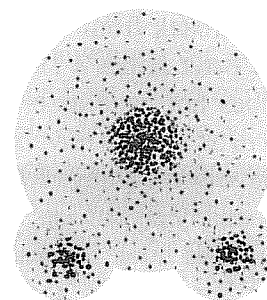
Roald Hoffmann, author of "Chemistry Imagined," won a Nobel prize. He also writes poetry, some of which is in his book. Vivian Torrence illustrates it with various collages pertinent to the subject. Hoffmann does not so much go through subjects as a textbook would, but instead presents each chapter as a meditation on one or another issue in chemistry. He begins with the importance of the elements and how they combine, and the equal importance of the structure of molecules. He gives us many diagrams, both of simple crystals and other chemicals such as glucose (the simplest sugar). Very early in the book he discusses these diagrams and how each kind of diagram eliminates one aspect of a molecular in order to emphasize another. For instance, we can have a stick diagram of water, with oxygen the center:



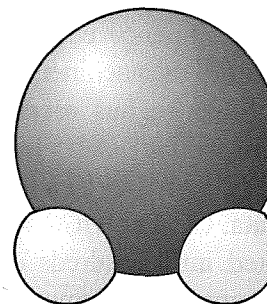
or we can have a similar diagram that illustrates the hydrogens' bond angle:



or we can have a diagram which shows the electrons as fuzzy clouds:



or another which treats them as hard hemispheres stuck together:



(Thanks to Cath Woolf for guidance on the preceding diagrams.) Molecules move in many different ways, not just rotating or moving from point to point, but with vibrations of all their atoms (those vibrations actually gave us ideas about molecular structure).

Hoffmann discusses a bit of history, too. He has kind words for the phlogiston theory, and tells how Priestley and Scheele, the "discoverers" of oxygen, initially believed they had made "dephlogisticated air." Lavoisier, for the first time, looked at atomic weights also, and gave oxygen its name. Perhaps partly for his ideas, he was beheaded.

About the middle of the book, Hoffmann raises one major difference between chemistry and other sciences such as astronomy or physics. Unlike the latter, which can only *discover* new things, chemists look for means to *create* new things. Such creation normally starts with substances made by other chemists, and uses these substances as a basis for building something new. Hoffman tells of Fritz Haber and the invention of a process to make ammonia, for instance... and adds to it a de-

scription of the way some bacteria fix nitrogen into another form, with much less work. The book ranges in this way through the entire spectrum of chemistry and biochemistry, and in one chapter even into the original formation of elements in supernovas. Along the way, you will get a much better idea of just what chemistry is about and why it is important.

The second book, "Our Molecular Nature: The Body's Motors, Machines, and Messages," by David Goodsell, basically discusses biochemistry, with lots of diagrams. It focuses on individual molecules and what they do, though it does start with a short discussion of how our cells consist not of nearly empty bags of liquid but of bags of liquid with lots of biochemicals seething around inside them. The diagrams usually aren't the stick-and-ball kind, but show the molecule as if its atoms run into one another, without clear boundaries.

The book discusses many different molecules, each one playing a role in physiology. The full title sets the basic theme: these molecules *are* motors, machines, and messages.

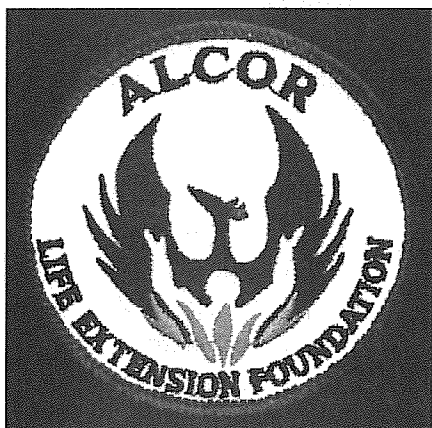
When Goodsell tells of a particular molecule, he explains how it acts as a machine, for example, to hold iron. He makes no pretense that his selection of biomolecules comes anywhere near a complete set; he simply discusses those he thinks either curious or important.

"Our Molecular Nature" is more a book for browsing than reading cover to cover. Leafing through it will give you an impression of the tremendous variety of molecular machines (natural nanomachines) which compose us, and will also teach you how each one works. The major point this book lacks is a discussion of what we might do upon learning how to take complete control over our biochemistry.

However, both books do point out the importance of actually synthesizing chemicals. Given the variety of elements and chemical milieus, it seems to me that we can never expect any single device or technique to make every possible molecule. Some form of chemistry will stay with us always.



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Tomorrow and Tomorrow
by Charles Sheffield, Bantam Books, NY, 1997

Reviewed by Brian Shock

First, you should know that I am not a Charles Sheffield fan. I have always found his characters shallow and unsatisfying, his storytelling clumsy and primitive, his ideas haphazard and ingenuous. In short, I feel that he writes like a beginner, despite his relative success as a science fiction author.

As much as I wanted "Tomorrow and Tomorrow" to modify these opinions, it did not. Even cryonics content, extropian themes, and cosmological scale could not save this novel from itself.

"Tomorrow and Tomorrow" sketches the nearly immortal life of Drake Merlin, an early 21st century composer whose beloved wife Anastasia dies from some unspecified form of cancer. In desperation, Merlin places Anastasia into "cryosleep" (an advanced form of cryonic suspension) and then has himself frozen a few years later. He awakens 500 years in the future, where he finds himself briefly indentured to a musical historian. "Cryocorpses" — including Anastasia, whose cancer remains incurable — are now stored on Pluto, Merlin learns. This hardly matters,

since future society considers his love for Anastasia to be "pathological." Perhaps it is, since Merlin kidnaps his wife's cryocapsule from Pluto and flees at relativistic speeds to the star Canopus. En route, he indulges an urge to see his wife's face, and in so doing disrupts the seal on her capsule. When he returns to Earth 300 years later (only a few months by his time), he is informed that he failed to reseal the cryocapsule properly; the ensuing months of denegeration have completely destroyed Anastasia's brain.

Most novels would end with this tragic note, relying on the slight rehash of the Orpheus myth as an underlying theme. "Tomorrow" has only begun, however. Merlin reenters cryosleep, with the instructions that no one should revive him until a treatment exists for the "irretrievable" Anastasia. Eventually Merlin's protectors do revive him, even though they cannot cure his wife; Merlin has been in cryosleep for over 14 million years, and he requires uploading into computer storage for safer keeping in the eons to come.

"Tomorrow" then lurches into its second section a mere six billion

years or so later, where a galactic federation of "composites" (uploaded group minds) returns Merlin to consciousness and asks for his help in battling a mysterious galaxy-wide enemy. Inhabited planets around the galaxy's rim are dropping out of the faster-than-light communications grid, and future civilization has forgotten all about war and weaponry. The composites awaken Merlin on the off chance that an ancient "barbarian" will remember a few useful obsolete tricks.

The war against the "Shiva" (Merlin's name for this unknown enemy) fills the novel's next third as one long series of digressions. Eventually Merlin makes *billions* of self-copies, spreading them around the galaxy as intelligence agents. When he finally solves the Shiva problem, his composite benefactors more or less expell him from polite society, forcing him to absorb all of the scattered Merlin copies. In this way, Merlin ends up as a "composite" also, but one composed of several billion copies of the same initial consciousness.

Although the reader will probably have forgotten Anastasia after

so long, Merlin does not. His only hope for reclaiming her is to wait until the end of the universe, the Big Crunch. (Conveniently, this story occurs in a closed universe. Cosmologists aren't yet certain about the fate of *our* universe.) According to future physicists (and some modern-day physicists such as Frank Tipler), information can only be dispersed rather than destroyed, and as the universe contracts, dispersed information will converge*. Theoretically, at some point not long before the final contraction, Merlin should be able to reclaim Anastasia in her original form.

I won't spoil the ending, though there isn't much to spoil.

Many readers of *Cryonics* won't mind if Drake Merlin's character is so sparse as to resemble a variable in an equation. Many more won't worry about the frequent dead-end plot lines that pad this story in typical Sheffield style. Most won't even flinch at the ubiquitous, inappropriate literary quotes. If you require nothing more from your science fiction novels than the hurling moons of Barsoom or an Arisian lens, you are in for a treat, though a rather astringent one at that.

However, if you are a cryonicist, you may find yourself annoyed by Sheffield's obvious lack of research into the cryonics aspect of his story. His opinions and "improvements" on the current practice read like my

weekly list of crank phone calls: he mentions the necessity of freezing with liquid helium rather than liquid nitrogen (having never examined the Arrhenius equation closely); he expounds on the superiority of freezing organisms under pressure, scoffing at the cryonicists who weren't aware of this technique (himself having never heard of vitrification research); he flatly states a belief that reviving conventional cryonics patients would be as likely as reviving Egyptian mummies (having never read Arthur Roe's similarly inaccurate epigram comparing the revival of cryonics patients to "turning hamburger into a cow").

But these errors of fact are trivial when compared with the novel's *selfless attitude*.

Did you make your cryonic suspension arrangements only because you wanted to accompany your loved ones to the future, or because *you* wanted to see the future? Do you want to extend your life as long as possible to live for the sake of others or for *yourself*? Drake Merlin is nothing without his wife. Over billions of years — the remaining life of the universe — he does nothing but mark time, never learning or developing until forced to do so. Everything he accomplishes is incidental or *accidental*.

I'm reminded of the protagonist in Heinlein's "Door into Summer," who was frozen by unscrupulous

business partners, or the protagonist in Pohl's "Age of the Pussyfoot," who ended up in suspension only because his friends and family improvised a spur-of-the-moment suspension at his death; once upon a time, viewpoint characters *never* had the will to choose cryonic suspension for themselves. I can almost hear some cigar-chomping pulp editor lecturing about how readers would never sympathize with a selfish hero who single-mindedly pursued his own goals — heroes had to be likable, and nobody liked a self-made superman. Drake Merlin's selfless dedication to his wife may offer a blunt hook that approximates likability to some, but such a broad character trait doesn't make him any more endearing than a hero who achieves personal goals through an interesting struggle. Further, Merlin's selflessness contributes to his apparent blankness as a character; he's so busy living for his wife, he has no time to demonstrate his own personality.

In the end, Sheffield's poor characterization and poor attitude fatally detract from the overarching cosmological tale he wants to tell. I just don't care about what happens to a character who doesn't much care about himself.



* As an example, this principle works much like the idea that faster-than-light travel would allow you to "look into past." If you could somehow jump 100 light-years away from Earth in an instant, you could intercept photons reflected from Earth 100 years ago. If you had an unimaginably powerful telescope, you could see events unfolding on the planet's surface from that time. Some of these "image-holding" photons would continue moving outward toward the edge of the universe. If the universe were to contract, gravity would bend the course of all photons — and their information — back toward the center of the Big Crunch. For more about this entertaining concept, see "The Physics of Immortality" by Frank Tipler (who Sheffield mentions in an extended non-fiction epilogue to "Tomorrow and Tomorrow").

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Watch for future program developments as Alcor's Third Annual Cryonics Conference approaches.

PROGRAM

Friday, April 3, 1998

7:00-8:00 pm	registration, reception	
8:00-10:00 pm	welcome: Merkle Mode Desert Contest	
	Speaker (tbc)	"Cryonics in Science Fiction"

Saturday, April 4, 1998

9:00-9:30 am	Introduction	
9:30-10:30 am	Fred & Linda Chamberlain	"Alcor Research Update"
10:30-11:00 am	break	
11:00-12:00	Ralph Merkle	"Nanotechnology Update and Molecular Repair of the Brain"
12:00-12:15	break	
12:15-1:30 pm	awards luncheon	
1:30-2:30 pm	Marvin Minsky (tbc)	
2:30-3:00 pm	break	
3:00-4:00 pm	panel	"What's in It for Me?"
4:00-4:30 pm	break	
4:30-5:30	Michael Cloud	"How to Make the Idea of Cryonics Infectious"
5:30-7:00 pm	break	
7:00-7:30 pm	reception with no host bar	
7:30-11:00 pm	banquet and fund raiser	
	Speaker (tbc)	

Sunday, April 5, 1998

8:45-9:30 am	Bus to Alcor Facility	
9:30-11:15 am	Alcor Tour and Sign-up Party	
11:15-11:45 am	Bus returns to Conference Site	
11:45 am-1:15 pm	lunch break	
1:15-2:15 pm	Paul Segall and Hal Sternberg	
2:15-2:45 pm	break	
2:45-3:15 pm	Dave Pizer	"A Retirement Community and Safe Storage"
3:15-3:30 pm	break	
3:30-4:30 pm	Robert Ettinger	
4:30-5:00 pm	wrap-up	

Letters, Continued from page 3

bioethicists would simply object to the fact of an agenda behind creating acephalic clones; as we have seen in the recent case where a couple conceived a child to act as tissue-donor for one of their previous children, society smiles only on random, unplanned, pointless creation of life.

I have found that when I launch into an explanation of "acephalic clones" (which I have on a few occasions), journalists tend to stop listening. "Transplanting frozen brains into clone bodies" offers a much tighter sound-bite than "transplanting frozen brains into clone bodies grown without brains," and so the former appears much more often than the latter. Although I'm not obsessed with pleasing the public, I prefer not to risk arousing it unnecessarily because of a misperception by the press.

Brian Shock

Dear Editor:

In the editorial, "Mortal Faith", David Pizer suggests that religion is causing the unnecessary deaths of its followers. I will assume that Mr. Pizer is basically talking about Christianity. Mr. Pizer states that religious leaders should stop making promises of an eternal afterlife:

"They may continue to say they think and hope there is such an afterlife, but they should not guarantee one." (pg. 23, 2nd Qtr. "Cryonics" 1997)

Mr. Pizer apparently does not understand that it is not the reli-

gious leaders who guarantee an afterlife. The guarantee of an eternal afterlife comes from the Bible, which is the Word of God.

2 Timothy 3:16 *All scripture is given by inspiration of God, and is profitable for doctrine, for reproof, for correction, for instruction in righteousness:*

1 Corinthians 15:49 *And as we have borne the image of the earthy, we shall also bear the image of the heavenly.*

1 Corinthians 15:50 *Now this I say, brethren, that flesh and blood cannot inherit the kingdom of God; neither doth corruption inherit incorruption.*

1 Corinthians 15:51 *Behold, I show you a mystery; We shall not all sleep, but we shall all be changed.*

1 Corinthians 15:52 *In a moment, in the twinkling of an eye, at the last trump: for the trumpet shall sound, and the dead shall be raised incorruptible, and we shall be changed.*

1 Corinthians 15:53 *For this corruptible must put on incorruption, and this mortal must put on immortality.*

1 Corinthians 15:54 *So when this corruptible shall have put on incorruption, and this mortal shall have put on immortality, then shall be brought to pass the saying that is written, Death is swallowed up in victory.*

John 3:16 *For God so loved the world, that he gave his only begotten Son, that whosoever believeth in him should not perish, but have everlasting life.*

Mr. Pizer states further in the article:

"Currently there is a technology, available to us biological mortals, to reach the future and become immortal; that technology is called

cryonics." (pg. 24, 2nd Qtr. "Cryonics" 1997).

There is no guarantee that cryonics will work. It is merely hoped that cryonic suspension will bring a person to a time when medical technology can cure whatever threatens that person's life. Any claim more than this, is deceptive. Belief in God, and the Bible, requires faith. As it stands now, cryonics requires faith as well.

Brent Fox
Calhoun, GA

Dear Brent:

Press and public alike often ask me if all cryonicists are atheists. I can now honestly say that this is not the case.

I have always regretted the perceived rivalry between religion and cryonics. Cryonic suspension is (or should be considered) a "speculative medical procedure," not a means of circumventing deities or spirituality.

For example, recipients of coronary bypass surgery wish to extend their lives, but no one accuses them of unreligious behavior. The primary difference between coronary bypass and cryonic suspension is a matter of probabilities — we know the rate at which coronary bypass surgery succeeds, but we don't yet have such information for cryonics. As long as we recognize this, we can treat cryonics as an experiment in progress rather than a matter of faith.

Brian Shock



Alcor Northern California Sign-up Party!

On **October 12**, there will be a meeting (oops, I mean *party!*) organized by the Life Extension Fellowship of Silicon Valley to help people make fast progress on their cryonics paperwork. We'll have a notary, life insurance agents, witnesses, paperwork for many cryonics organizations, representatives of Alcor and ACS, and "Certificate of Religious Belief" wallet cards.

There will be an ACS board meeting before this event, and an Alcor North meeting and potluck afterward. Here are the details:

Date: Sunday, October 12, 1997

What: 11am: ACS board meeting

2pm: Help with cryonics paperwork

Also Dim Sum (that is, **food!**) courtesy of Ralph Merkle

4pm: Alcor North meeting

6pm: Potluck dinner (that is, **bring** some food!)

Where: **Tim and Ailing Freeman's house**

(408) 720-1778

1104 Hollenbeck Ave.

Sunnyvale, CA

Directions: follow Route 101 to Mathilda, which is in Sunnyvale, about an hour's drive south of San Francisco. Take Mathilda south to El Camino Real. Go right (north-east) on El Camino one block until you get to Hollenbeck. Go left (south) on Hollenbeck. 1104 Hollenbeck will be on your left immediately after Remington.

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The Alcor Life Extension Foundation is a non-profit tax-exempt scientific and educational organization dedicated to advancing the science of cryonics and promoting it as a rational option. Alcor currently cares for 35 patients in cryonics suspension, and has hundreds of signed up Members. Being an Alcor Member means knowing that should the worst happen Alcor's Emergency Response Team is ready to respond for you, 24 hours a day and 365 days a year.

Alcor's Emergency Response capability includes equipment and trained technicians in Arizona, New York, Indiana, Northern California, Southern California, and England, and a cool-down and perfusion facility in Florida. Alcor's Arizona facility includes a full-time staff with employees present 24 hours a day.

Meetings

Board of Directors Meetings

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

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

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

Bay Area

Alcor Northern California meetings are held the second Sunday of each month at 4:00 PM, followed by a potluck supper and socializing. All members and guests are welcome to attend. For meeting information, call Alcor at 1-602-922-9013

Boston

There is a cryonics discussion group in the Boston area meeting on the second Sunday each month. Further information may be obtained by contacting Tony Reno at (508) 433-5574 (home), (617) 345-2625 (work), 90 Harbor St., Pepperell, MA 01463, or reno@tfn.com (email). Infor-

mation can also be obtained from David Greenstein at (508) 879-3234 or (617) 323-3338 or 71774.741@compuserve.com (email).

District of Columbia

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

England

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

The address of the facility is:

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

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

is on the trading estate on your right.

If you're coming to an AUK meeting you should phone ahead since meetings are sometimes rescheduled. Call Garret Smyth on 0181 789 1045 or Garret@theoffice.net or Mike Price on 0181 845 0203 or Alan Sinclair on 01273 612 071. Note: the email address listed above for Gattet is different from the previous erroneous listing.

Florida

Austin and Glen Tupler, two Alcor members living in Florida, are interested in revitalizing Alcor's local group in their state. For more information about local meetings and organization, please contact them at 954-583-0801.

Los Angeles Area

For more information about local meetings in this area, call Alcor Director Michael Riskin at (714) 879-3994.

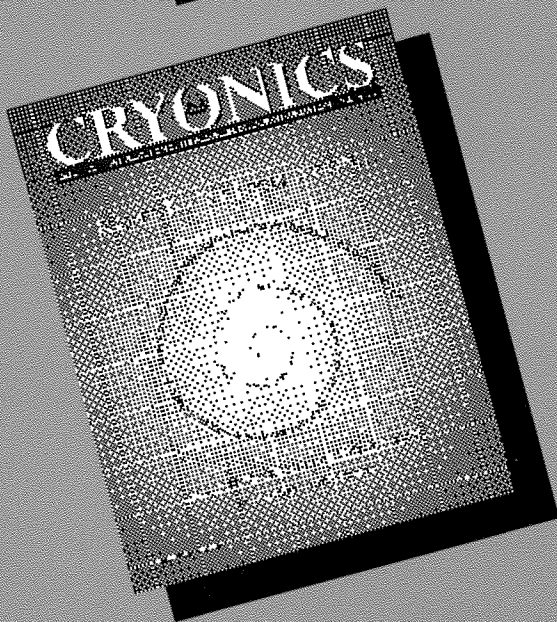
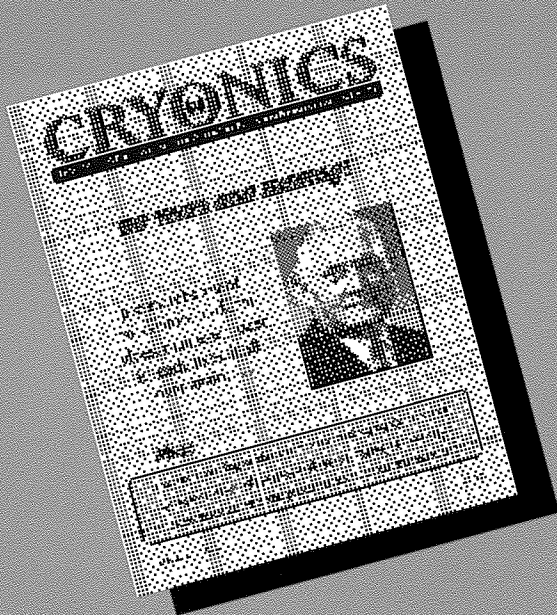
Indiana

Alcor's former president, Steve Bridge, has returned to his home state and plans on organizing local meetings. If you would live in the Midwest U.S. and would like to meet other cryonicists in your area, call Steve at 317-375-0968.

San Diego

Alcor's Medical Director, Dr. Thomas Munson, lives in the San Diego area and wishes to get a local Alcor group started. If you would like to get in touch with Dr. Munson, call 619-454-2321.

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