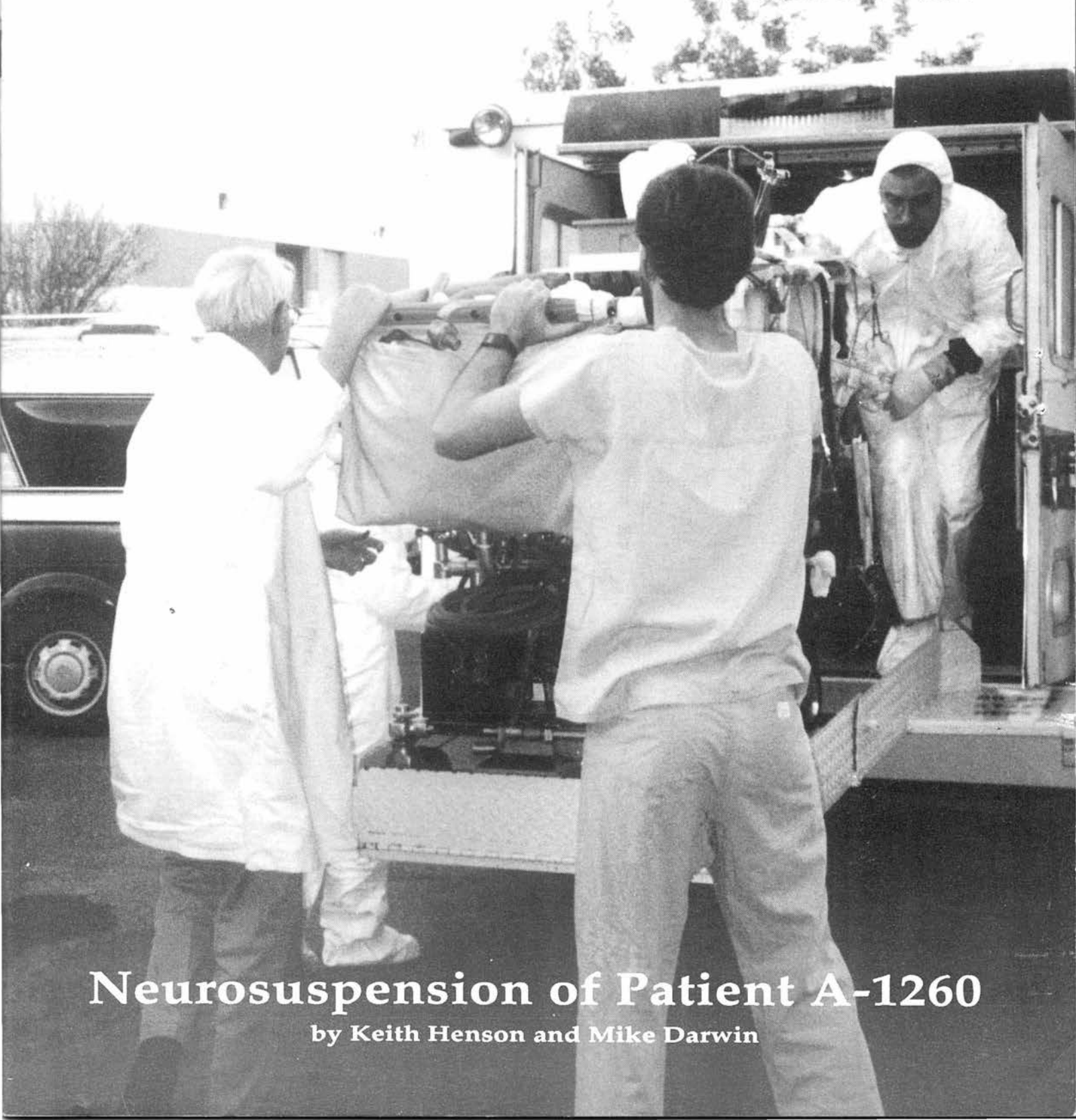


Cryonics

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Neurosuspension of Patient A-1260

by Keith Henson and Mike Darwin

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Cover: The team arrives in Riverside, where Ralph helps Hugh and Mike Darwin unload the patient via the ambulance lift gate. (Photo by Carlos Mondragón.)

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Issue to press: April 17, 1992.

Alcor Adds 21st Patient

This issue contains a wonderfully detailed report of the suspension of Alcor Member A-1260, who is referred to by the pseudonym "Nick" in honor of his request for anonymity. I knew Nick only casually, having met him a few times over the past couple of years. He was the sort of guy who evoked passionate, adamant responses from people, both from those who loved him and those who did not.

I liked him instantly and adamantly, for the same reasons that I like most Alcor members, only more so. He was forthright, funny, fun, opinionated, and intelligent. He was also an important man, who had a lot of things to say — things that needed to be said — and was saying them.

Nick, we will miss your fire for a while, but we will not stop caring for you.

Omni Update

In the March issue, I wrote a short piece entitled "Omni Deluge," which included a reprint of an article written by Alcor Suspension Member, Charles Platt. That article, "Confessions of a Cryonicist," appeared in the February issue of *Omni* along with our 800 number, prompting *Omni* readers throughout the U.S. and Canada to call us requesting more information. In the March issue, I stated that "This direct, one-page testimonial has already prompted over 400 *Omni* readers to call us for more information, and this is as of February 7! At this rate, the publicity power of this article will outpace the cryonics episode of *Donahue* in a matter of weeks!"

How right I was. Now, 9 weeks later we have received a whopping 917 information requests as a result of that article. Nineteen of those requestees have already become subscribers, and 6 others have applied for Suspension Membership! This compares extremely favorably with the publicity garnered from the *Donahue* show, which aired almost 2 years ago now (July of 1990) and has brought in 734 inquiries to date, 20 subscribers (12 of whom have since renewed), and 6 applicants for Suspension Membership (4 of whom have completed the sign-up process).

It's obvious that in a few weeks the information requests from this article will

top the 1000 mark. And Charles, not content with this, is working on another *Omni*-related cryonics project that could blow this one out of the water. I'll report on that in a future issue.

Once again, our sincere thanks go out to Charles Platt.

And A Good Time Was Had By All

If you weren't present for the celebration of Alcor's 20th Anniversary and the 25th Anniversary of the Freezing of the First Man, well, *you missed it*. For the 65 of us who *didn't* miss out, it was a truly engaging evening of presentations, panel discussions, and social interaction of the sort unique to cryonicist gatherings.

There were nine presentations in all, followed by a panel discussion by the nine speakers: Fred Chamberlain, Linda Chamberlain, Saul Kent, Carlos Mondragón, Max More, Greg Fahy, Mike Darwin, Ralph Merkle, and Greg Benford. (Mike Perry, the unofficial but uncontested Cryonics Historian, participated in the panel

discussion as well.)

All of the presentations were fascinating, containing unique historical perspectives, new and exciting research results, and insightful philosophical commentary. Greg Fahy quickly became the life of the party after showing extraordinarily encouraging light-microscopic and electron-microscopic slides of glycerolized brain cells. I hope to cajole Greg into formalizing a written version of his presentation for a future issue. Ralph Merkle, though, receives my personal 1992 Nano Eye-Candy Award with the computer-animated video presentation of various molecular bearings in motion that he and Eric Drexler generated.

I expect to publish at least a couple of the presentations in future issues. The complete text of Fred Chamberlain's historical perspective on Alcor will probably appear in the next issue. Thanks again to Maureen Genteman for her fantastic organizational skills and efforts in putting this together, and to Paul Genteman for his inimitable performance as the Master of Ceremonies.



Photo: Hugh Hixon
The Anniversary Dinner Discussion Panel. Left to right: Paul Genteman (standing), Fred Chamberlain, Greg Benford, Linda Chamberlain, Max More, Carlos Mondragón, Greg Fahy, Saul Kent, Ralph Merkle, Mike Darwin, and Mike Perry.

News Flash

The Death With Dignity Act will be on the November ballot in California. *Californians Against Human Suffering* submitted 567,407 signatures supporting the Act, far more than the required 385,000.

Although our information here is not complete, our understanding is that if this initiative passes, it will be lawful for a physician to assist in the death of a patient who has been certified by two physicians to have less than 6 months to live. How state autopsy laws and associated difficulties will apply to this is not yet clear. We should have more information on this in the next issue. (Thanks to Keith Henson for supplying this information at the last minute.)

From the 1988 British dictionary *Theutichinson Encyclopedia*:

"Cryonics — process of freezing at the moment of clinical death with the aim of enabling eventual resuscitation. The first human treated was James H. Bedford, a lung cancer patient of 74, in the U.S.A. in 1967. The body, drained of blood, is indefinitely preserved in a thermos-type container filled with liquid nitrogen at -196 °C."

The editors claim "Over 1.5 million copies sold." Thanks to Russell Whitaker for providing this information.

Letters to the Editor

Dear Editor,

I'd like to thank Mr. Lawson for his comment on my column (*Cryonics*, March 1992). I wish to point out though, that the term "transhuman" was not coined by FM-2030 (then F.M. Esfandiary). It is true that he has popularized the term (as has Ed Regis in the title of his book), but he did not coin it. The original usage was by Julian Huxley (1887-1975) before 1973. Unfortunately, I no longer recall the year he coined this term.

If the Editor will allow, I'd like to note that a regular feature in my journal *Extropy: The Journal of Transhumanist Thought*, called "Futique Neologisms" defines and attributes many future-oriented terms of interest to immortalists, Extropians, and Venturists.

Max More

Dear Editor:

As an older cryonicist I am wondering if there has been any interest expressed for a retirement community or if there are any plans for one in the future. Although this is a subject of importance — or will be — to each member, I cannot recall much discussion of the topic in *Cryonics*.

I have read in the *Venturist Monthly News* a comment that David Pizer was contemplating a facility on his grounds. A letter to him several months ago brought no reply. There has also been some talk about a retirement ranch targeted for Laughlin, Nevada. Is there any truth to that?

It would be appreciated if an update on these plans or any similar activities on the part of these and other members were to soon appear in the magazine. Perhaps *Cryonics* could print an open request for all suggestions on where and how and if a retirement residence or community could and should be founded.

Sincerely,
Paul Garfield

Right now there are no firm plans that I know of to form a cryonics retirement community, although there certainly are people interested in pursuing this. I don't expect that much progress will be

made on this idea, though, until our current search for a new facility is successful. However, I do encourage people interested in this idea to contact us here, so that we have an idea of how much interest there is in such a thing. — Ed.

Dear Editor:

Those of us who are Alcor members desire to hold on to life's rich moments as long as possible. With each day, the prospect that cryonics might work comes closer, thanks at least in part to Alcor's staff.

From time to time, I hear Alcor members saying how grateful they are to the staff members that work in the "trenches" at Alcor. From time to time, I hear Alcor members saying what a shame it is that Alcor doesn't do more about the low pay that our staff members receive for their long hours — and then they change the subject. Or, they suggest that Alcor pay their staff more money. That is like saying our country is in a recession and the government should print more money and give it to the people. I learned long ago in economics "One shouldn't impart what one doesn't have."

Well Alcor doesn't have more money to pay them more and the staff is usually the ones that have to say, "Alcor can't afford to pay us more." This sounds like the staff is saying they are satisfied with the low salaries they are making and therefore is misleading.

The staff knows they are working for below market wages. They would like to be paid more but they know Alcor is on a tight budget. There is no more dedicated, dutiful, hardworking group of people in cryonics today than the Alcor staff. There is only one group of people who can rectify this financial inequity and that is the Alcor members. Therefore I am appealing to all members who feel that the staff is underpaid and want to correct this delinquency. I am suggesting that we immediately start a special fund where members who are concerned can send in directed donations each month to be used solely for supplementing the low wages of the Alcor staff. These donations could be added up during the month and at the end of the month they could be split equally between each staff member in the first pay period of the following month. Those who

want to help out might want to mark their calendars and send in what they feel they want to donate on a regular, monthly basis.

I suggest that the proceeds from this "Staff Salary Supplement" fund should be divided equally between each full-time, regular staff member who has no other major outside income, regardless of the individual differences in regular salary they make from Alcor. In other words, if there were 5 full-time staff members, this fund would be divided equally into 5 parts. I am enclosing my donation to get the fund going and I hope others who have been concerned about the low wages we have been forced to offer our staff members will put their money where their mouths are. I suggest that members, who want to help, mark their checks "Staff Salary Supplement" donation. And, remember, those donations, made to Alcor, are tax deductible.

If other members feel the same way I do and Alcor begins to receive regular donations for SSS, I would like to see a short report each month showing how much the donations are.

Sincerely,
David Pizer

A Comment:

Thanks, Dave for your generous offer. It's nice when Alcor members offer to help out with the ever-present funding problems, including salaries for the full-time staff members. For some time there has been discussion about how to raise funds and/or cut expenses. One proposal was just to cut some staff positions, though it was decided against (though as it happened two individuals did leave for other reasons). Another proposal, to ask for donations, has been tried and is continuing to produce results, as now.

There was a third proposal, which involved the idea of asking for a contribution and offering something in return. In one version the "something" was to be a medallion with a cryonics theme. Since this is the 25th anniversary of Bedford's freezing, that idea was decided upon. I had done some work of this sort before (designing medallions that is) and offered to contribute what I could. The design I came up with (see illustration) is based on a photograph of Bedford from a 1917 col-



lege yearbook and on the Alcor phoenix.

Happily, the work has been progressing and it looks as if it will soon bear fruit. I have located a company that can engrave dies and do the striking, starting from 9-inch models which I am now preparing. Current plans are to produce a 1-oz. (troy) version in silver, which will be about silver-dollar size (approximately the size shown in the illustration) and a 1/4-oz. version in gold, which will be about nickel size. These are to be issued, and orders accepted, during the calendar year of 1992 only. Further details, including prices and ordering information, will be announced when available.

Mike Perry

To the Editor of *Cryonics*,

I was glad, at long last, to see the article in the March 1992 *Cryonics* by Carlos Mondragón explaining Alcor's policies concerning the funding of cryonics. I was glad to see that Alcor is moving away from T-Bills, that economies of scale are being achieved, that Alcor is more committed to fiscal responsibility or fairness than to grandfathering, and that the Patient Care Fund is in a sound position. I do, nonetheless, have many criticisms of the article and the thinking that lay behind it.

Carlos said, "Providing the capital for a suspension which will happen at some undetermined point in the future is primarily the responsibility of the suspension member," but guarding the Patient Care Fund capital is the responsibility of the Alcor Board of Directors. I am wondering why this latter statement was made. My concern is that it is an attempt to tell members not to worry themselves about matters that are the responsibility of the Board of Directors — to "have faith" in them. But every member who has made suspension arrangements for the purpose

of achieving a greatly extended lifespan is taking *full* responsibility for his or her own life. That means not blindly delegating responsibility for the Patient Care Fund to the Board of Directors. An Alcor Member can take responsibility for how the Patient Care Fund is handled by: (1) educating, lobbying or pleading with the Board to adopt better financial policies (2) switching to another cryonics organization or (3) terminating suspension arrangements altogether if the policies appear so bad that financial failure seems inevitable.

The kind of economic analysis Carlos gives appears monetarist or Keynesian, rather than libertarian. Carlos speaks of the Fed forcing short-term interest rates down to stimulate the economy, adding "Politically, this can only last until fears of inflation rebound, since people hurt by inflation vote in much greater numbers than those affected by unemployment." The "economic law" that there is an inverse relationship between inflation and unemployment (the "Phillips Curve") is pure Keynesianism. It is also wrong. Even a casual observer of world economies has a hard time missing the fact that there are plenty of countries which have both high unemployment and high inflation (like Italy), and others with low unemployment and low inflation (like Japan). Keynesians have short-range thinking and attempt to do "macroeconomic analysis" rather than think in fundamental terms. (When asked about the long-term effects of deficit spending, Keynes replied, "In the long run we are all dead.") A fundamental analysis of the Phillips Curve reveals that sudden inflation in the short-term lowers real wages (the "price" of labor), resulting in increased demand for the cheaper labor. In the longterm, however, unions will anticipate inflation in their demands for higher wages — eliminating the Phillips Curve effect.

Carlos speaks of an "assumption" that T-Bills do not "generate a rate of interest

greater than the rate of inflation." He dismisses this "assumption" by asserting that, through the magic of the free market, "over the long haul, investors can and do demand a real return on their money." He assures us that T-Bills give at least a 2% return and that "Sometimes, when inflation fears are high, we get more (as in the late seventies)."

The problem with this analysis is that it makes no reference to fact. The graph on page 16 of the October 1991 issue of *Cryonics* shows that at no time from the late 1940s until the early 1980s were T-Bills giving any real return above inflation. And the late 1970s, when inflation was high, was a period in which T-Bills were lagging noticeably behind inflation. High interest rates are no guarantee of a real return — inflation may be higher (and that is exactly what happened in the late 1970s). It was only in the mid and late 1980s (not shown on the graph) that a slight positive return was seen on T-Bills — and only because inflation was reduced and the economy was booming.

I want to stress that my article on inflation and this letter have not been written in the spirit of personal attack. My concern is that the policies governing the management of the Patient Care Fund — while ostensibly very conservative — are guaranteed to lose money. The Patient Care Fund itself may not be endangered because of the *Ten Percent Rule* of putting 10% of all unrestricted income into the Fund. But why should unrestricted income be used to compensate for money-losing policies? Wouldn't it be better to have that money for legal expenses or research? Adjustable Rate Mortgages do give a better return than T-Bills, but in the long run, all fixed-income securities lag greatly behind diversified portfolios of equities. This point was made so clearly in my article in the October issue of *Cryonics* that there is no need to repeat it here. But I am less concerned that this conclusion is not accepted by Carlos than I am with his underlying reasoning. T-Bills are simply *asserted* to give a *real* return — an assertion which has no basis in fact, an assertion for which no attempt at factual justification is made, and an assertion that ignores facts to the contrary. Epistemology rooted in fantasy, or speculation that ignores facts, can have dire consequences far beyond the solvency of the Patient Care Fund.

Devising gimmicks to cover-over bad investment policies is not the best way to proceed. A Patient Care Fund which is properly invested would not need infusions

from unrestricted income. Large suspension minimums are a poor way to deal with long-term poor returns on poor investment. And a surcharge on membership dues for a "sinking fund" of fixed-income securities will drag everyone down (unless the "sinking fund" receives 10% of unrestricted income). If providing capital for a suspension in the indeterminate future is the responsibility of the members (not the Alcor Board of Directors), then please dispense with the "sinking fund," proceed with the regular suspension minimum increases, and allow me to invest my money in equities.

Once again, personal attack is not my purpose. My purpose is to see cryonics succeed — and that means sound financing. I empathize strongly with the desire for risk-free investment, but I caution with great urgency against looking at nominal returns rather than real returns. I caution against financial gimmicks which ignore the question of investment policy. And I caution against over-concern about short-term market effects when the frame

of financial reference for cryonicists should be 50 to 100 years or more.

Sincerely,
Ben Best

Carlos Comments:

I did not mean to suggest members should have "faith" in our management of the Patient Care Trust Fund. The sentence Ben quoted was meant to emphasize the member's responsibility for providing adequate funding. Once a suspension occurs, Alcor is, in fact, responsible.

I'm afraid Ben read way too much into the sentence he quoted about the political consequences of inflation. It was not a defense of Phillips Curve theory (I agree with him on that); rather, it was an elementary observation of political reality and what will happen to interest rates when people fear inflation. Further, ideology has little to do with financial success: I don't know of a single dogmatic libertarian on the Forbes 400 list (Warren Buf-

fet is a liberal Democrat). Alcor is a survival mechanism, not a libertarian club — expectations of political correctness are just another unproductive burden on our resources.

Ben's discourse on the inflation/T-Bill issue begs the question. I simply have more confidence in the marketplace than in graphs based on numbers compiled by bureaucrats. In any case, T-Bills now comprise less than 25% of the Fund's assets and that percentage is diminishing rapidly, and as the Fund grows, the portion of it which can be invested in equities will also grow.

The "sinking fund" I suggested would have to be invested in equities (sorry I didn't say that in the article). We don't need to dispense with this idea in order to accommodate any member's wish to handle the problem himself: all the member has to do is have the requisite funds and a foolproof mechanism for transferring them to Alcor at legal death.

For the Record

Gilgamesh and the Transhuman Condition

Mike Perry



Although cryonics got its start in the 1960s, its roots go back to the dawn of history and far beyond, for the wish for immortality seems as old as humanity itself, a basic part of our nature. What forgotten lore may have preceded the invention of writing we can only conjecture. However, among the oldest written literature we possess is a tale that offers a stirring account of one man's quest for everlasting life, a message about reality, and some food for thought for the would-be futurist.

The *Epic of Gilgamesh* recounts a series of adventures of a king Gilgamesh of the ancient Sumerian city-state of Uruk, in Mesopotamia (modern Iraq), about 70 miles from Babylon. Recently archae-

ologists have been able to determine that there really was a king Gilgamesh of Uruk, who ruled around 2700-2600 B.C. The epic, in its original form, appears to date from several hundred years later, around the early 3rd millennium B.C., when the image of the king, who seems to have done a creditable job of building up and fortifying the city, must have been magnified and embellished considerably.

Starting from the Sumerian originals, versions of the story multiplied into other tongues and cultures such as Babylonian, Hittite, and Canaanite. (In particular it seems highly likely that the epic, or other literature related to it, influenced the early chapters of the Old Testament.) More ele-

ments were added, and further changes were made. Despite the inconsistencies and variations among the different versions, however, it has been possible, in modern times, to piece together a reasonably coherent story plot from fragmentary sources (usually cuneiform-inscribed clay tablets) which stretch over several civilizations and millennia. (The discovery and decipherment of these ancient texts, which were lost and forgotten for more than 2,000 years, makes fascinating reading in its own right, but would take us too far afield.)

Although the story, like many another ancient tale, is full of mystical and supernatural elements, it remains focused on

reality. The gods do not save man from his lot here on earth, do not fundamentally alter the nature of things, but in this case serve to highlight its features and bring home the need for man to confront his own problems.

The epic (in the 1972 English version of N. K. Sandars — see Sources) opens with a tribute to the king (as with many ancient writings, the authorship of the epic is unknown):

"I will proclaim to the world the deeds of Gilgamesh. This was the man to whom all things were known; this was the king who knew the countries of the world. He was wise, he saw mysteries and knew secret things, he brought us a tale of the days before the flood. He went on a long journey, was weary, worn-out with labour, returning he rested, he engraved on a stone the whole story."

Gilgamesh was "perfect, surpassing all others, terrifying like a great wild bull." The gods made him two-thirds divine and only one-third human. The dedication continues with a brief summary of the architectural accomplishments of the king: walls, a rampart, and a temple were built to impressive proportions.

In the story proper the young Gilgamesh, despite his perfections, is presented as overbearing, profligate, hedonistic — and generally too much for the good citizens to handle:

"... the men of Uruk muttered in their houses, 'Gilgamesh sounds the tocsin for his own amusement, his arrogance has no bounds by day or night. No son is left with his father, for Gilgamesh takes them all, even the children; yet the king should be a shepherd to his people. His lust leaves no virgin to her lover, neither the warrior's daughter nor the wife of the noble ...'"

To remedy this the gods are sought — not to do away with the king, but to provide a companion to keep him occupied: "You made him, O Aruru [a god-



THE EPIC OF GILGAMESH — N. K. Sandars

"GILGAMESH COUNTRY" IN ANCIENT TIMES

ness of creation], now create his equal; let it be as like him as his own reflection, his second self, stormy heart for stormy heart. Let them contend together and leave Uruk in quiet."

So (in a story reminiscent of the Biblical creation of Adam) Aruru takes wet clay and fashions it into a man, Enkidu, "like an immortal from heaven." At first Enkidu lives with the wild beasts. Then he is inducted into civilization, is seduced then instructed by a temple prostitute, and returns to the wild again, but is unhappy, for the animals now reject him, and he longs for a comrade, "one who would understand his heart."

Gilgamesh meanwhile is advised by his mother (who is a minor deity) about Enkidu: "He is the strongest of wild creatures ...; born in the grass-lands and the wild hills reared him; when you see him you will be glad; you will love him as a woman and he will never forsake you. ..."

Gilgamesh and Enkidu turn out to be just right for each other. They share a number of adventures, the main one being a "forest journey," which seems to have an actual historical basis as an expedition undertaken by Gilgamesh for building lumber. (Whether Enkidu was historical or not is unknown, but in some earlier versions of the story he is depicted as a servant rather than a near significant-other.) The forest

journey can be viewed on different levels, including a psychological one in which it is seen as exploring "the dark forest of the soul" (N. K. Sandars' commentary). Considering it as a real expedition, opposition would have been expected from the local inhabitants to a depletion of their resources.

In the story the real details, such as they may have been, are mostly replaced by mythical ones, but certain plausibilities remain; mainly, this theme of opposition. Chief among the resistance is the giant Humbaba, the guardian of the forest, who is cornered and, proving not as tough as was thought, begs for mercy. Gilgamesh is ready to spare his life, but not Enkidu, who persuades his friend and together they dispatch him. But now the powers that be (supernatural in this case) are angry, and Enkidu's days are numbered. Eventually he falls ill and dies. Gilgamesh (who by now, one gets the impression, is older and more thoughtful) must face the problem of mortality. He doesn't like it. He must find an alternative.

His search takes him on a long journey culminating in a voyage over the "waters of death" to visit Utnapishtim the Faraway, who with his wife was uniquely elevated by the gods to immortal status after surviving a deluge that shows a remarkable affinity to the Genesis account.



THE EPIC OF GILGAMESH — N. K. Sandars

DETAIL FROM THE SEAL OF GILGAMESH,
VORDERASIATISCHES MUSEUM, BERLIN

However, when Gilgamesh wishes to join him, Utnapishtim is not hopeful, just (in ordinary human terms) realistic:

"There is no permanence. Do we

build a house to stand for ever, do we seal a contract to hold for all time? Do brothers divide an inheritance to keep for ever, does the flood-time of rivers endure? ... The sleeping and the dead, how alike they are, they are like a painted [scene of] death. What is there between the master and the servant when both have fulfilled their doom? When the Anunaki, the judges, come together, and Mammetum the mother of destinies, together they decree the fates of men. Life and death they allot but the day of death they do not disclose."

Gilgamesh however is determined, so he is given a task to perform — to go without sleep for "six days and seven nights" — but he fails. A second

and last chance, a magic plant that will reverse the aging process, is lost when the plant is stolen by a snake (which then sheds its skin, as snakes will do, in a form

of self-renewal). Gilgamesh is defeated, and in time, "lies in the tomb."

The dream, however, would not die. Today we are pursuing it with renewed vigor, and in the words of Evan Cooper, "... certain men and machines won't rest until eventually death has been thrown to the mat and pinned."

In closing, one is struck by the thought that, like Gilgamesh of old, we still are hybrid creatures, part animal, part god. We hybrids view the future, a limitless prospect, and wish to take part, not just collectively, but individually. Until very recently the dream had to be abandoned, or rooted in unverifiable suppositions. But that has changed, and it now appears that, through technology, we ourselves may complete the task half-finished by nature, the transformation to godhood that will open a new chapter in the story of life as we know it.

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Immortalist Philosophy

Memory: Replacement by Inference

Max More

Attempts to defeat the inevitability of death through biostasis will be frustrated if the process fails to preserve enough of what makes us who we are. According to the psychological criterion for personal continuity (or identity), the person who is revived from suspension is the same person as the one who went into suspension if

and only if they are psychologically continuous. A and B are psychologically continuous if they are connected by overlapping chains of strong psychological connectedness. Strong connectedness means that there are *enough* direct psychological connections. How many is enough is fairly arbitrary; we might say



that continuity requires earlier and later stages of a person to have at least 50% of the number of psychological connections that would normally exist over the course of a day.

Direct psychological connections include memories (from the "inside") of the earlier person's experiences persisting in

the later person. Direct psychological connections include more than memory, though these have been the most prominent factors in most discussions of personal identity; another form they take is the persistence of a disposition. If the person revived from biostasis exhibits the same dispositions as the pre-stasis individual, then we have grounds for believing them to be distinct temporal stages of the very same person.

A third type of connection exists between an earlier intention and the later execution of the intention. For example, the resuscitated person goes on a hike up Olympus Mons on Mars on the anniversary of her first mountain climb, and does this *because* she had decided to do this years before being suspended. This would be evidence for the persistence of the very same person.

So, for us to survive cryonic suspension, our memories, dispositions, and intentions must persist. Damage to or destruction of these psychological connections resulting from the suspension procedure must be repaired or reversed whenever possible. The purpose of this installment of the column is to pose the question: If all neural traces of memories (dispositions, intentions) have been lost, are inferred and reimplanted memories as good as those restored by repair of existing neural traces? I will suggest that the answer should be affirmative.

There are two reasons why someone might fear that implanted memories might not be as good as "real" memories. First, the concern might be about the etiology of the memories. Assume we replace your lost or damaged memories by gathering information from various sources external to your brain and then altering your neural weightings so that you will have access to the implanted memories.

This is obviously a very different process than the one which normally causes us to lay down memories. In the typical case, sense impressions or internal neural processes lead to the formation of internal representations of experience. But, when memories are implanted, someone is gathering information about what your memories probably were about from sources like your friends and associates, your diaries, known activities, lists of the books you read, and copies of your daily schedules and to do lists. Information gathered from these sources might then be fed into an algorithm that tells the memory engineer what adjustments to make to the patient's brain.

Though these typical and extraordinary sources of memory are very different, their results might be qualitatively indistinguishable. If the memory engineer successfully recreates your missing memories (or gets close enough), why should you be concerned about their causal history? In wanting to survive as the same person, what matters is the persistence of psychological continuity and connectedness, but not its cause. In the future, perhaps just 10-20 years from now, we might use

neural-computer interfaces and micro-electronic or nano-mechanical devices attached to our brains to store memories. If these devices were integrated into our cognitive functioning, then the memories stored in the mechanisms would be just as much ours as those stored in the usual fleshy mechanisms of the brain.

Second, someone might believe that implanted memories are inferior to "the real thing" because they believe that the two types of memory would be qualitative-

How Many Are We?

Alcor has 312 Suspension Members, 465 Associate Members (includes 162 people in the process of becoming Suspension Members), and 21 members in suspension. These numbers are broken down by country below.



Country	Members	Applicants	Subscribers
Argentina	0	1	1
Australia	13	1	4
Austria	0	1	1
Brazil	0	0	1
Canada	11	4	22
Denmark	0	0	1
France	0	0	4
Germany	1	1	2
Holland	0	1	0
Italy	0	2	1
Japan	1	1	0
Lichtenstein	0	0	1
Mexico	0	0	1
Norway	0	0	2
Portugal	0	0	1
Spain	6	2	0
Sri Lanka	0	0	1
Turkey	0	0	2
U.K.	11	6	7
U.S.A.	269	124	270

ly different. It is often thought that memories are much like internal photographs. It might seem that inferred and implanted memories would not be experienced as internal pictures and so could not be the same.

This way of thinking about memory is undermined by evidence that our internal representations are not like pictures at all. Cognitive psychologists have devised clever tests to determine what is really happening in the case of individuals with eidetic ("photographic") memories. The subjects are convinced that when they access a memory of something they have seen, such as a page of a book, they are looking at a determinate image. However, it took the subjects much longer to access the words at the end of the page than near the begin-

ning, suggesting that they had to sequentially process the information rather than scan across an internal page.

Another hint that our memories are not picture-like but are reconstructions of what we expect to remember is the evi-

In wanting to survive as the same person, what matters is the persistence of psychological continuity and connectedness, but not its cause.

dence demonstrating how expectation influences recall. In one experiment, subjects were shown a brief flash of a struggle between a white and a black man, one of whom was brandishing a knife. Most subjects "remembered" the black

man holding the knife, though in fact it was held by the white. Their memory was not a sharp picture in their head but an internal reconstruction of what they thought they had seen. You may have come across many cases of false memories — instances where you seem to remember events from a viewpoint that you couldn't have had (such as outside your body) or events that never happened.

If our typical memories are reconstructed or inferred rather than existing as pictorial representations, then memories inferred from unusual sources and implanted in the brain should be just as good. This is good news for cryonicists, allowing us another degree of freedom when considering possibilities for restoration of personality.

Future Tech

...The More They Stay The Same

Guest Columnist, Arel Lucas

I'm guesting for Keith this month since he has already pummeled his brains enough doing both a suspension and a suspension report, co-authoring the latter with Mike Darwin. And since I have a bone to pick.

(I don't know why that phrase has taken on such a hostile implication. As though picking a bone with someone were accomplished by grabbing it back and forth, growling with closed and chewing mouths. Why not an image of intimate sharing of food, offering choice pieces to one's partner, sucking the marrow from both ends . . .)

Now that I've grossed out the vegetarians among you, here's the bone. Keith has painstakingly shown in past columns, in good engineering fashion and with juicy images, what a future with working nanotechnology might be like. I would like to point out not what will probably change, but what will probably stay the same.

Human beings are highly conservative. Although I am aware from my extensive reading on evolution and primate

behavior how much we have evolved over millions of years, I was impressed by the feeling of family evoked by my visit to primate playtime at Marine World Africa U.S.A. last Sunday. Three chimpanzees, females ranging from 1-1/2 to 9 years, were herded out to play by a veterinarian and a professional keeper. The *Pan troglodytes* specimens behaved, essentially, like hairy people who walk funny. The nine-year-old displayed tool use in probing the vet's Chapstick with a stick to get the last bit out once she had sucked it nearly dry. The older ones interacted with the trainers in truly childlike fashion, and the youngest obeyed voice commands better than my urchin does yet at the age of 9.

Later, after their return to quarters, a solitary orangutan (by report that's how they like it) with a single keeper emerged onto the playground, which looked like a scaled-down version of a kid playground elsewhere on premises. Her keeper was emphasizing how these animals like solitude, how they are incapable of human-style emotions, etc., when she

came over to him, and as though on cue, just as he had denied an orangutan's capacity for love, offered him her toy, and took obvious pleasure in his playing with her. I was reminded then of an earlier look on the oldest chimpanzee's face. It was exactly the same as that of a playful human who has just provoked a fellow to rough play, and knows he or she is now "going to get it." She produced exactly the same grimace, and exactly the same gesture: she crossed her wrists over her head protectively. (A most sensible reaction to predictions of the future.)

Here are the visions in my crystal ball of the conservatisms which I see prevailing:

1. We are probably not going to become any more rational. The strange behavior of lobotomized people is the result of the fact that they are cut off from their emotions. The frontal lobe is responsible for vectoring all human perceptions through the limbic area, by which they are colored with emotion. Perceptions,

whether visual, auditory, gustatory, olfactory or tactile, cannot be properly stored without that emotional trace. Unless we lose the rhinencephalon, the limbic system, reprogram the frontal lobe, and re-engineer the endocrine system entirely, we are going to be left with "rationalism" as an impossible goal. Sorry, Don Quixote, you can tilt at that windmill all you want, but humans are not rational creatures. It has been said that, instead, we are "rationalizing" creatures, and I think that's right on.

2. The medical ethic will probably stay the same, except more so. Both fortunately and unfortunately for those of us in this transition period, medical ethics will almost certainly continue to evolve into a state where no lump with human genes will be abandoned to its fate, no matter how monstrous, no matter its age. Until perhaps sometime during the last century, people recognized that some things born to human beings can never be human — ones lacking brains, for instance. It has been adjudicated recently that anencephalic babies with only the brainstem extant are not "dead," and their transplantable organs must go to waste because they must die of ischemic injury.

It has also been decided by prosecutory precedent that a 23-week-gestational preemie must have thousands of dollars per day spent on its intensive care — although current medicine at the best children's hospitals can barely hope to save any gestational product of that age, and only with a grave prognosis for its fu-

ture. This bodes well for those of us who wish to save both our own and other's bacon from this deathist age, but ill for our being able to deanimate with peace and dignity, and ill for the finances of our health care system before nanotechnology makes medicine more efficient and powerful.

3. Managing human behavior will not change, except to go further in the direction of team organization. Hierarchies do work, but they work best when based on experience rather than naked power and/or acquisition. Committees don't work unless they become teams. One lesson of our age has been that cooperatives are unworkable where self-interest is subordinated to some nebulous "group." That particular leftist peoples' experiment, in which I participated fully a number of times in the '60s and '70s, wasted eternities of time arguing over procedural details, because it never divided responsibility, assigned out tasks for report back, delegated authority. How can you delegate authority when it's already divided equally among the members of a group?

In the States we're engaged in learning the lessons reflected back at us by imitators of management styles advocated but seldom followed up in our own country. The Japanese learned our lessons well — make individuals responsible for the quality of products; tailor each responsibility for the person to whom it belongs, according to training and ability; group the people responsible for a divisible portion

of a product, no matter their backgrounds or experience, and let them learn from each other. And the three Cs: communication, communication and communication. Of course there's also a fourth C: checklists, with people's names beside each item, another management tool for which the method might change ("Paper? You write on what with what?"), but the functions both of supplementary memory and communication of priorities and needs will not disappear.

4. People will still need each other. This is related to all of the above — the management of behavior, medical ethics, and the fact that we're 99-44/100% irrational with just enough logic to solve word problems. Loving support, in whatever form it takes, will remain the basis of human existence; where it breaks down people wither and die.

Culture in the sense of human society is exactly the same as culture in a Petri dish: we support what nourishes us. And what nourishes us best is each other. So our culture continues to be reflections and refractions of ourselves bouncing off one another and our artifacts, "shards of god," as Ed Sanders once put it, reflecting his own belief that human beings together comprise god in the making. This is one thing that I not only believe, but very much hope will not change — our appreciation of and caring for each other. Mainly because if it does change, whence will come the motivation to fetch us old-timers out of cryostorage?

Isaac Asimov, R.I.P.

Steven B. Harris, M.D.

It was with sadness that I heard about the passing of Isaac Asimov on Monday, April 6. His death was not unexpected for those of us who have followed his doings, but such things are always a shock nevertheless.

For those of you who don't know him, Isaac Asimov is (was) the premier science writer of this century. He was born in Petrovichi (then in the U.S.S.R.) in 1920, emigrated with his family at age three to America, and grew up the son of

Jewish candy store owner in Brooklyn. He showed early brilliance, but after getting a Ph.D. from Columbia and climbing the scientific academic ladder to professor of biochemistry at Boston University School of Medicine, discovered that he was not really a researcher, but a writer. (His department head discovered the same, apparently, and Asimov left academia for the world of full-time professional writing in 1958 with an institutional foot planted firmly on his

posterior.)

Boston Med School's loss (such as it was) was the world's gain, for Asimov was a polymath possessed of the world's clearest writing style and an associative memory of encyclopedic scope. (By all accounts, including his own, also an ego of proportionate magnitude). He ended up writing more than 500 books, on subjects across the spectrum from religion to history to science to several categories of fiction.

He was one of my boyhood heroes. From early on I read every book of his that I could lay my hands on, from science fiction to science fact. It was Isaac Asimov who got me interested in chemistry at the age of 10, with books on the chemical elements and the history of chemistry. Because of him I started on organic chemistry at age 15 with *The World of Carbon* (can't start any more basic than that book), and later taught myself biochemistry early in high school, all from Asimov's books. (Anyone who says that science is a mystery to him/her has no excuse: just go to your local library and look in the author index system under "A.") I had originally planned to be a medicinal chemist and did not quite end up going down that path, but it is no exaggeration to say that Asimov is in a major way still responsible for my career in medicine.

Last fall, when I heard through a mutual acquaintance that Asimov was gravely and irreparably ill, I obtained his New York City address and wrote a belated first and only fan letter to him at his apartment, one which not only said Thank You, but which also contained a lengthy plea that he reconsider the idea of cryonics (I also sent him the most recent Alcor handbook). I didn't have much hope for this last action, since for years I'd been reading Asimovian essays on overpopulation, and I was even aware of one essay from the '70s in which Asimov had specifically attacked the idea of cryonics. Still, I thought it no harm to try, and I did need to tell the man how much his writing meant to me. If my letter gave him a single smile it was worth the time it took to write it.

He never answered. And (worse) he didn't take me (or anybody else) up on the challenge. I learned later that he had long had some contact with certain members of Alcor New York, so it turned out that even as regards Alcor I probably wasn't telling him anything about cryonics that he didn't already know. Asimov's problem with cryonics was not lack of access or money (his writing had made him rich), and certainly was not lack of brains or scientific knowledge — his problem lay elsewhere.

Asimov was a contradictory man: although his mind ranged through time and

space in his books, in real life he was a lifelong acrophobe (who never flew in his life) and more importantly, an agoraphobe — a man who was much more comfortable with a typewriter in a sealed apartment in an overcrowded city (see *Caves of Steel*) than physically exploring new things. Such people do not like even the thought of being physically thrust naked into the future. As we cryonicists have observed of certain science fiction fans, when it comes to the future, they'd rather travel there by armchair, or not at all.

Moreover, while Asimov was a rationalist, an atheist, and a committed

Asimov's future worlds are either giant warrens of humanity (where overpopulation would make the idea of life extension a joke), or else empty worlds where people live in such psychological isolation that living long seems a punishment.

humanist (he was a founder of the American Humanist Association), he was also heavily liberal or even socialist in his politics. In consequence, many of his popular writings abound with cautionary warnings about the damage which would be done to "society" or "mankind" by personal immortality (such as overpopulation, stoppage of natural selection, stultification of research because of lack of fresh viewpoints in positions of power, etc.). Whatever you and I may think of these arguments, they were enough for Asimov, and he had enough integrity to back them up with his life when the time came.

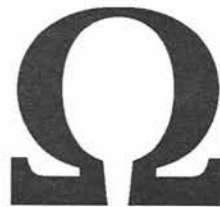
And perhaps this was not so hard to do, considering the way Asimov saw things. For as a science fiction writer his view of the future was not overly bright, and (again) his phobias seem to blame. Asimov's future worlds are either giant warrens of humanity (where overpopulation would make the idea of life extension a joke), or else empty worlds where people live in such psychological isolation that living long seems a punishment. Neither of these futures sounds like much fun, but Asimov could not seem to break free of one idea or the other. Asimov's stories also frequently describe another kind of joylessness: people fighting hopelessly against some ridiculous and restric-

tive social custom or belief in either a crowded or empty world — a custom which seems perfectly rational to the persons who hold it. There is considerable irony here, for Asimov himself died doing exactly what everyone around him was doing in the way of dealing with death, as much caught up in the social norms of his own culture as any of the various "enforcers of the status quo" in one of his stories. Again he could not seem to break free.

In any case, whatever the reason, Isaac Asimov is gone, ashes to ashes. The lesson for us, if there is one, is the familiar one that the road to radical life extension is a rocky one. It isn't enough to be lucky of circumstance, intelligent, knowledgeable, atheistic, or incredibly rich. (For what is a man profited, if he shall gain the whole Walmart, and lose his own suspension?) You can, as an individual, have all these things and die anyway, because you still

have psychological and political hurdles you can miss. As Asimov missed his. Asimov really believed he needed to die in order to give me more space (thanks, Dr. A, it feels much roomier now), but then again, he'd never flown over Arizona in a commercial jet. He really believed that personal immortality would stop human evolution, and I suspect that his ego would have prevented him from absorbing any argument that cultural and genetic evolution will become the same thing in a few years. Asimov really believed that powerful and inflexible people need to be removed by death in order to make a better world. He was a man of considerable power who believed this inflexibly....

And let us admit it — perhaps he was right. But what if he'd changed his mind?



The Stuff That Dreams Are Made Of

Ralph Whelan

A few months ago, Alcor Suspension Member Eric Klien made a directed donation of \$5,000 to Alcor, for the purchase of a Michigan Instruments Heart/Lung Resuscitator for the Alcor New York group. This piece of equipment is essential for a well-equipped local group, and I commend Eric for his generosity. (He bought the HLR for Alcor New York knowing he was about to move away from the Northeast.) Brenda Peters, President of the New York group was more eloquent than I in her gratitude:

I think we'll all sleep a little better knowing that [the HLR] is available for us if we need it. Someday we'll all look back on this and talk about how your financial help was a major boon to our newfound growth in the northeast. . . .

Only by working together can we save

ourselves and our friends and loved ones from oblivion. Hopefully, each of us will make a contribution equal by some measure to yours, Eric. But yours comes at a particularly strategic time in our history and thus is all the more valuable. It fuels a momentum that is critical to our success.

Our deepest and sincerest thanks go out to you.

In thanking Eric for his donation, it's important to point out that he made use of an offer presented by Paul Wakfer in the December 1991 *Cryonics*. In the interest of helping people help Alcor, Paul has made available "between \$50,000 and \$100,000... for any Alcor member to borrow against" for the purpose of a donation to Alcor. This offer is still open, and Paul has given me permission to restate the terms of his offer as follows:

- a) Only donations (directed or undirected) to Alcor are eligible for consideration.
- b) The loan is made for a period not to exceed 10 years.
- c) The interest rate is adjusted quarterly to 75% of the current 10 year federal government bond rate.
- d) Interest must be paid quarterly.
- e) Principle is repayable at any time without penalty.
- f) If the borrower is an Alcor suspension member, a promissory note stating these conditions is acceptable. Otherwise, collateral or a co-signing guarantee from a suspension member will be required.
- g) The receipt for tax purposes goes to the borrower.

The interest rate that Paul is using is so low, he is in effect making a donation that could be as much as half of the original donation, with the borrower supplying the other half.

Thank you, Paul and Eric, for your important contributions.

Contemptuous Bureaucrats

Carlos Mondragón

On Friday morning, April 10th, I had to wake up at 0530 in order to be at the downtown Los Angeles Courthouse by 0830. For once, it was worth it. The occasion was an *ex-parte* hearing before Judge Aurelio Muñoz.

I had recently made an attempt to get Jerry Leaf's death certificate certified. This had not been done earlier because of the Health Department was insisting on calling Alcor a cemetery on the concurrent VS-9 form and we wanted to avoid that. But an important need arose in this case when Kathy Leaf discovered that she could not get a new title to the house that she and Jerry owned in joint tenancy without a certified death certificate. Because she

needed to refinance and interest rates are inching up, every day of delay was a major hardship for her. The surprise came when I went to get the certification and discovered that sometime since the new year, the Department had changed its policy and decided that it would not give us certification under any circumstances.

Our lawyer called their lawyer. He was told that they had decided that since they had appealed, Judge Muñoz's injunction against them was *automatically* stayed. Only one problem: it doesn't work that way. In this particular situation the meaning of the law is quite clear. The Muñoz judgment is the law of the land until overturned or stayed by the appellate

court. They never even asked for a stay.

There was only one way to proceed: our attorney gave notice that we would be in court on Friday morning asking Judge Muñoz to order the Health Department to Show Cause why they should not be held in contempt of court and also asking him for an *ex-parte* (immediate) order forcing them to certify Jerry's death certificate.

When the doors to the courtroom were unlocked at 0820, about a dozen attorneys rushed in. They all wanted something from Muñoz within the half hour allotted for "law and motion" before his 0900 trial was scheduled to begin. The judge stood at his clerk's side and swiftly dealt with business. Until there were only three people left waiting to see him: Alcor's attorney, David Epstein, Deputy Attorney General Tammy Chung representing the Health Department, and me.

Still standing by his clerk, Muñoz leaned over a bit, turned his head to look at Ms. Chung with eyes that could cut through steel and asked, "Are you instructing your clients to violate my order?"

As usual, she stuttered, she hemmed,

she hawed. Muñoz interrupted: "I want this on the record, call in a reporter." He went up to his bench and sat down. It seemed that the court reporter was there and ready in about two minutes.

Ms. Chung was so flustered that she couldn't quite complete a sentence until Muñoz told her "Don't worry counselor, I won't put *you* in jail." She tried vainly to justify her client's position. Muñoz interrupted with "But he's dead, isn't he?" (No, you're not having an episode of *deja vu* — this has happened before.) This time she responded with, "They don't think he's

dead!"

"Who doesn't think so?"

"Alcor."

"Who do you represent, Alcor or the State? Does the State think he's dead?"

After this, Epstein stated our position for the record. Then Muñoz ordered that the Health Department pay a fine of \$1000 per day until such time as they comply with his order. He also ordered that Dr. Ken Kizer, the *head* of the State of California Health Department in Sacramento, come to court on April 22nd in Los Angeles to show cause re contempt. In fact,

everyone in the chain of command between Dr. Kizer and the clerk at the Watts office of the health department who turned me down when I went to get Jerry's death certificate certified will have to show up on the 22nd.

Muñoz agreed to sign an order on April 13th, specifically ordering immediate certification of Jerry's death certificate. In some ways I almost hope they ignore that order. Because if they do, these bureaucrats will end up in jail, where someone will do to them what they've been trying for so long to do to us.

To Move Or Not To Move?

Ralph Whelan

That is the question, prompted by a very enticing and comparatively inexpensive building in Scottsdale (near Phoenix), Arizona. The answer seems to lie somewhere between "Do we dare to?" and "Do we dare *not* to?" At the April 5 Board of Directors meeting, the DoWeDareTo's and DoWeDareNotTo's (some 40-plus members and members-to-be in all) had at each other for several hours. The issues line up something like this:

- Arizona is seismically *much safer* than California. The patients (and staff!) will be safer there.
- Our present facility is difficult to work in. It is *too small*. We are bursting at the seams, and our off-site storage facilities — which are not cheap — are also bursting at the seams.
- Our present facility is difficult to look at. Our neighbors, who are practically in our own front yard, are not dependent on a clean, medical image, and it shows. This affects our exposure in a negative way.
- The local zoning commissions will not give us a zoning variance as long as the very legality of cryonics in this state is still being litigated. This precludes a move to a larger and/or prettier facility within California.
- The California State Health Department is attempting to make cryonics illegal in California. If they succeed, other states

may follow California's lead and not allow us to enter. If we already have a presence in another state, that state would have a much more daunting task in attempting to remove us. Further, it's unlikely that Arizona will soon approach the oppressive over-regulation of California.

- The cost of living and operating in California is significantly higher than it is in Arizona. The overall figures that I've seen put this at about 11%, but these do not take into account things like Worker's Compensation Insurance, which is simply outrageous in California. Further, since the Alcor staff is underpaid, moving to a lower cost-of-living state would be analogous to receiving a raise in pay.

- A move anywhere, particularly to an out-of-state location, will be *very expensive*. No one's quite sure how expensive, but a conservative estimate probably approaches \$50,000. (!) That does not take into account the many months of disruption in the work schedules of the staff. Further, the current staff could not support two facilities, which means that moving will tend to be an all-or-nothing endeavour.

- Might we be moving from the frying pan to the fire? We're researching the political climate in Scottsdale right now, but even if we get a green light and a red carpet, what will happen once we are *there* and *doing suspensions*?

- How will this affect our ability to service

members? What about the Los Angeles area members, the largest concentration of Alcor members anywhere? There are arguments that they will have the opportunity to form a local group and be self-sufficient like other areas, but will this happen smoothly? Further, despite having an impressive facility, will enough people see it? Phoenix is not *nearly* the commercial and societal hub that Los Angeles is, so less people are likely to make the sort of "side trips" to the facility that we see now.

- The climate in Scottsdale will be unpleasantly hot for the staff.

- The Phoenix metropolitan area is smaller than L.A., so supporting an intensely diversified business like Alcor is bound to be more difficult.

Prerequisites for any area we consider are as follows: an inexpensive supply of liquid nitrogen; proximity to a major airport; substantially less seismic activity than we are currently subject to; weather which always permits year-round travel; affordable real estate; a tolerant regulatory climate (not necessarily in that order of priority). Prerequisites for specific properties were: 10k to 15k sq. ft. of space; attractive appearance; good price; attractive surroundings.

The specific building that was the topic of the April meeting is probably not going to be available. However, the search in the Phoenix area continues; if we do find a building that everyone can agree upon, Alcor will not purchase it. Instead, it will be owned by a partnership such as Symbex, the partnership that owns the building Alcor occupies right now.

We'll keep you posted on developments in this subject. If you have specific comments or questions, please call or write a Letter to the Editor.

Neurosuspension of Patient A-1260

H. Keith Henson and Mike Darwin

Transport Team:

Hugh Hixon, *Transport Team Leader, Surgical assistant*
Mike Darwin, *Oversight, Consultant, Femoral Cutdown*
Arel Lucas, *Airway Management, Temperature Probe Placement*
Tanya Jones, *Medications, Scribe*
Max More, *Scribe, Airway Relief*
Paul Wakfer, *Logistics Support, Airway Relief, MALSS Monitoring*
Carlos Mondragón, *Film and Video Recording*
Leonard Zubkoff, *HLR Operator, Oxygen Supplies Management*
Keith Henson, *Carpenter Assistant, O.R. Nurse, MALSS Monitoring*

The responsibility of suspending members can be overwhelming at times. After all, if medical personnel err and kill someone, they have cost that patient the remaining years of his or her life, at most a few decades, more commonly a few years. If we fail, we could be costing our patients (who are often our friends) a chance at near immortality. Worse yet, if we don't do it (given the current state of cryonics), they will have no chance at all. Thus, cryonics is a stressful occupation (or whatever you think it should be called), and much of this article will be illustrating this point. The oversights are reported for the usual reason: so we can learn and do better next time.

A few weeks ago, patient A-1260 was one of that growing number of people well acquainted with cryonics, but not signed up. He had been to a number of Alcor functions over the years and was friends with several Alcor members. Because of his desire to remain anonymous, he will be known as "Nick" in this article.

Nick had been diagnosed with HIV from the time tests became available in 1987. As is common with HIV infection, he remained symptom-free and clinically well for a number of years following diagnosis of his HIV-positive status. However, as is almost inevitable with this disease, his T-cell count began to decline and he began treatment with zidovudine (AZT) and other chemotherapeutic agents to slow the progression of the disease, and to ward off opportunistic infections.

Like many patients on AZT, he stayed relatively free of symptoms until the last

five months of his illness. At that point he began developing multiple problems starting with a cytomegalovirus (CMV) infection of his gallbladder which was treated by surgical removal and medication with the antiviral drug ganciclovir. And again, as is typical of patients on AZT, he responded poorly to treatment. This infection was followed by another, this time cryptosporidium. (It now appears that patients on AZT do not live appreciably longer than those not taking the drug. However, they have a course which is characterized by more "well" time followed by a rapid decline, with the opportunistic infections which cause death being unresponsive to treatment. The reason for this difference is not yet understood.)

While the decision to join Alcor came late as a result of the usual mix of denial and funding problems (insurance is not available to HIV-positive people), once he and his lover "Jim" decided to make suspension arrangements, the sign-up process was completed in about two weeks.

It is worth pointing out that while Nick and Jim had long considered making suspension arrangements, it was their perception that it was not possible to do so given Nick's terminal status and his uninsurability. Due in large measure to the intervention and encouragement of Alcor member Steve Harris, this misunderstanding was cleared up and financing was put in place with a mixture of some up-front cash and a second mortgage on their home. Alcor does not encourage this kind of last-minute preparation for cryonic suspension, for the obvious reason that last-

minute can very quickly become *too late*. It is very important to point out that flexible financial arrangements *are* available, and can be made well in advance, and that Alcor will work with anyone to facilitate their cryonic suspension. This case also points out how the thoughtful intervention of a friend can make the difference between someone's getting suspended and not getting suspended. This is not an easy subject to broach with someone you care about who is dying, and Steve is to be commended for his courage and caring in doing this.

One of us (Mike Darwin) has had extensive experience both in-hospital and in cryonics-related situations in caring for terminal patients. Pain and discomfort are the handmaidens of death, and at best dying is not a pleasant business. However, even Mike was unprepared for the degree of misery Nick was in. Nick suffered from pancreatitis (perhaps as a result of his treatment with the new anti-retroviral drug didanosine, and perhaps as a result of CMV infection of his pancreas), which caused him severe abdominal pain, unrelenting (day and night) hiccoughing, and near-constant nausea and vomiting.

In addition, he had frequent diarrhea as a result of cryptosporidium infection. (Cryptosporidium is an organism that normally infects sheep and occasionally infects humans, causing a one-time illness similar to a case of "tourista" from which the patient recovers uneventfully. It causes severe diarrhea in immunocompromised humans, and there is currently no effective treatment. Experimental treatment with the newly available antibiotic azithromycin — which had been anecdotally reported to be effective against cryptosporidium — failed to control Nick's infection.) Any one of these would have been a misery; together, the infections had him in a constant nightmare.

The constant nausea and vomiting had prevented Nick from eating or drinking for several months; his food and fluid requirements were being met by intravenous feedings with total parenteral nutrition (TPN). Nick had been on every anti-nausea med-

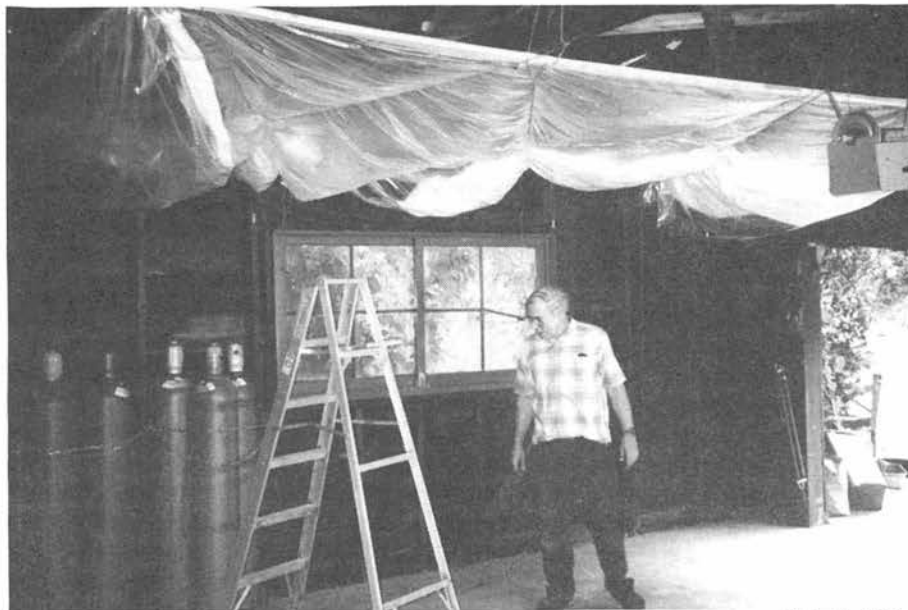


Photo: Hugh Hixon

Keith Henson surveys preliminary work of turning a garage into a field operating room. By cutting cords, suspended plastic sheets drop down to form walls.

ication available in the U.S., including Marinol, the FDA-approved version of marijuana. Unfortunately, Marinol is not nearly as effective at suppressing nausea as its natural counterpart. It was a source of some frustration that due to the U.S. drug laws Jim was unable to secure any marijuana in an attempt to relieve Nick's nausea. Mike has known several patients suffering intractable nausea secondary to cancer chemotherapy (including a lady in her late 60s!) who found that the only thing that relieved their nausea was pot. The misery that Nick suffered as a result of this law is unconscionable. Since both Jim and Nick are libertarians, the irony of this situation was not lost on them even in the midst of their suffering. Compounding this stupidity is the recent ruling by the FDA that no further applications for releases will be accepted for the legal medical use of marijuana. Due to drug enforcement efforts marijuana has become difficult and costly to obtain — unlike cocaine, a far more dangerous drug, which continues to decline in cost.

Nick's suspension arrangements were completed by March 14th, so the next day Hugh Hixon and Keith Henson went to Nick and Jim's home in the Los Angeles area to set up for the initial stages of the suspension at their home. Hugh had already scouted out the situation, which was about as poorly set up for a MALSS-supported stabilization as could be imagined. Nick's bedroom was up a staircase with three turns in it, and the twists and turns at

the entrance of the house made it impossible to get the MALSS (Mobile Advanced Life Support System) cart inside. The only feasible location for set-up was a garage located about 60 feet from the front door up a steep street. Considering that it took us over two minutes to move the last patient about six feet, there was concern over the ischemic time such a move would cause if Nick were pronounced in his bed.

That day, with Jim's assistance, Hugh and Keith cleaned out the garage, moved in several oxygen bottles, built a plastic

enclosure large enough to hold the MALSS cart by stapling plastic sheeting to the ceiling beams, and installed 2000 watts of lighting. Typically, this would not be necessary, since most houses have at least one doorway that will admit the MALSS cart. So, while it was kind of rough and ready, the nurse who pronounced Nick when the time came commented that he had certainly seen worse set-ups used for operating rooms in Vietnam. Keith and Hugh also restocked the cart and ambulance, refilled the MALSS cart oxygen cylinders, and for practice ran through as much of the process as they could manage.

While the patient's name will not be given here, his name and the fact that he had made suspension arrangements circulated among his friends, and word of this reached Mike Darwin. Mike (who knew Nick personally) offered his services, and, though the team thought they could manage without him, the offer was gladly accepted. Mike came in and found a number of oversights and deficiencies and he worked most of the afternoon and evening of March 15th with Hugh Hixon to remedy these shortcomings. One of the most glaring was Keith's failure to clean out (or even remember) the vacuum system on the MALSS cart from the last suspension. This is one of the side effects of doing things while 20 hours short of sleep. Well, that one goes on a checklist.

Earlier in the day (on the 15th), Mike had participated in a call from Steve Harris and conference with the Alcor Staff regarding Nick's medical situation and

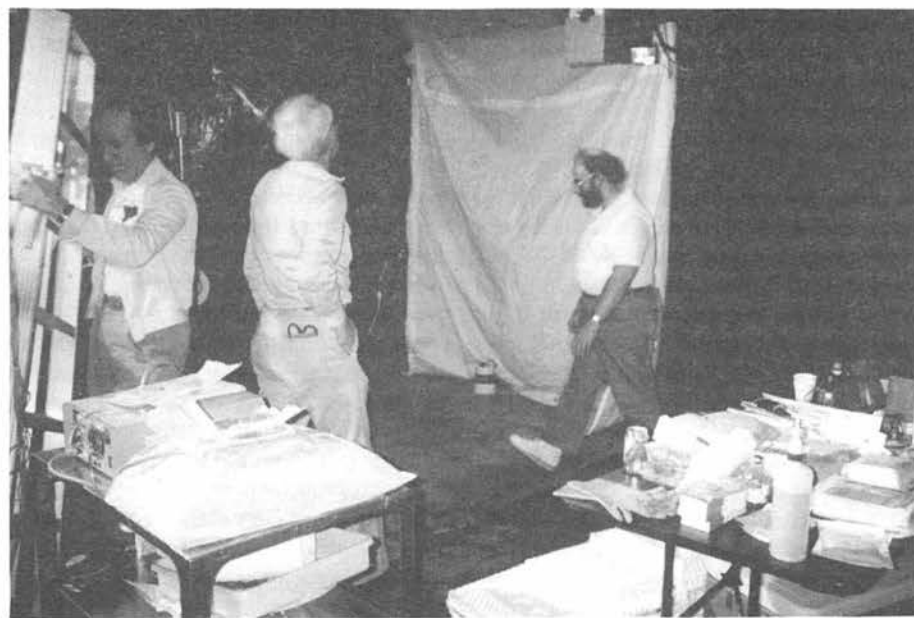


Photo: Carlos Mondragón

**With the whole team present, work continues on the garage/O.R.
L to R: Paul Wakfer, Hugh Hixon, Leonard Zubkoff.**

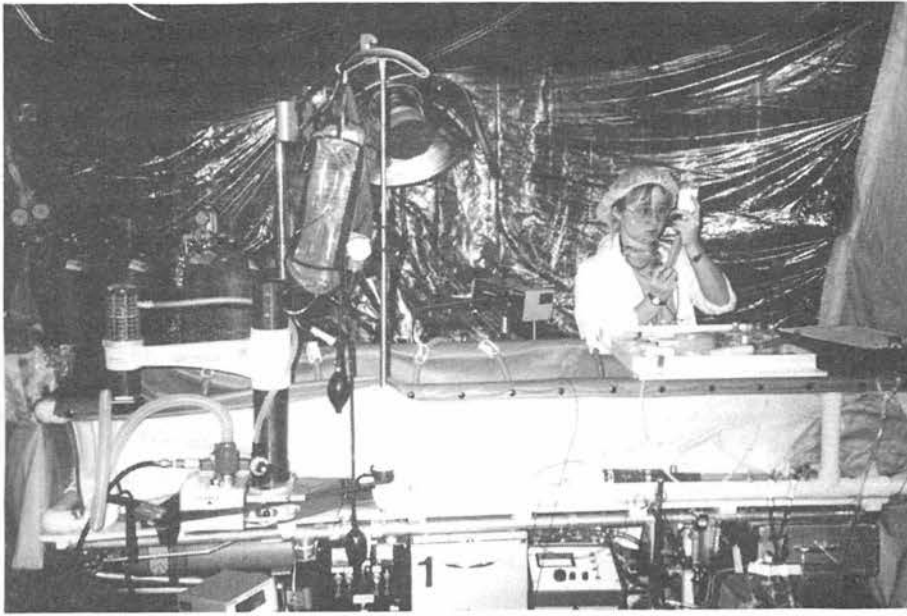


Photo: Carlos Mondragón

The time is drawing near. Tanya draws up some last minute medications.

prognosis. Nick had decided to end his misery by dehydration, and had stopped all food and fluids (with the exception of a morphine infusion) the previous Thursday (March 12th). (As with previous similar situations, we point out that in terminal cases such as Nick's, dehydration is the only means of hastening death that will *not* result in an autopsy. Legal initiatives such as Thomas Donaldson's have yet to ameliorate this barbaric necessity.) Both Steve and Mike expressed concern over this since with Nick's large fluid losses as a result of his diarrhea and vomiting, he was liable to dehydrate very quickly. Both Steve and Mike expressed surprise that Nick was even still alive. The Alcor staff related that they had been told by Nick's treating physician that death from dehydration would take a week to ten days. Unfortunately, this physician was probably not charting fluid intakes and outputs and was thus speaking in general rather than specific terms.

(Since Nick was still alert enough on Sunday to sit up and hold a conversation, Keith went back to San Jose, knowing that dehydration cases typically last a week or sometimes more, and not being aware of the conversation between Steve and Mike. He was home for less than 24 hours when the call came through that Nick was near death, having dehydrated much faster than expected. Keith now has a rather different view of dehydration times when a patient has large fluid losses from diarrhea or other causes. In spite of the cost involved,

he has become a champion of being on site and ready based on the *shortest* estimate.)

Early on the morning of the 16th a call came in to Alcor from Jim and the Registered Nurse attending Nick. They reported that Nick's condition was very grave and that death seemed imminent. Mike was put in touch with Jim and the attending RN. At that time Nick was unconscious and in deep shock with a blood pressure of 40/0, a respiratory rate of 3-4 a minute, and pupils which were only sluggishly responsive to light. Since the

suspension team could not be on location for at least two hours and additional preparation to the MALSS cart and ambulance were needed, Mike asked the attending nurse if he could pour what prescribed IV fluids they had available into Nick to reverse his shock and give Alcor more time to set up. Without this timely intervention, it is almost certain that Nick would have suffered hours of ischemia before an Alcor team could arrive. As we know from previous unlucky patients, this would have resulted in a very poor quality suspension.

Since it was by no means certain that Nick would respond to fluid resuscitation, it was decided that Mike should come into the lab, and assist finishing up preparation of the MALSS and setting up the operating room as quickly as possible. Mike and Hugh worked throughout the night to get this done. At about 8:00 a.m. a call came through that after he had stabilized, Nick was again deteriorating and that the transport team should come at once. By this time the equipment and team were almost ready to depart, although several critical items were still not in place. They were delayed approximately another 45 minutes to an hour before they could depart.

On hearing the news, Arel, Leonard Zubkoff, and Keith flew into the Los Angeles area. The available staff members drove the ambulance with MALSS cart and the Cryovita van full of support supplies over to Jim and Nick's home, and Max More was recruited from his university job for the standby. By 11 a.m. on Tuesday we

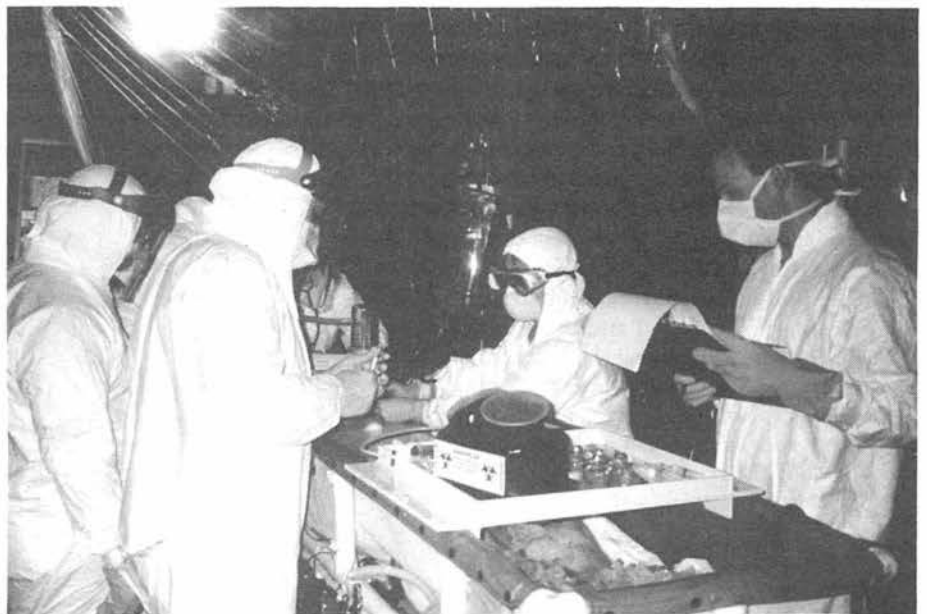


Photo: Carlos Mondragón

The initial procedures are underway. Keith Henson and Tanya Jones continue work on medications, while Max More takes notes.

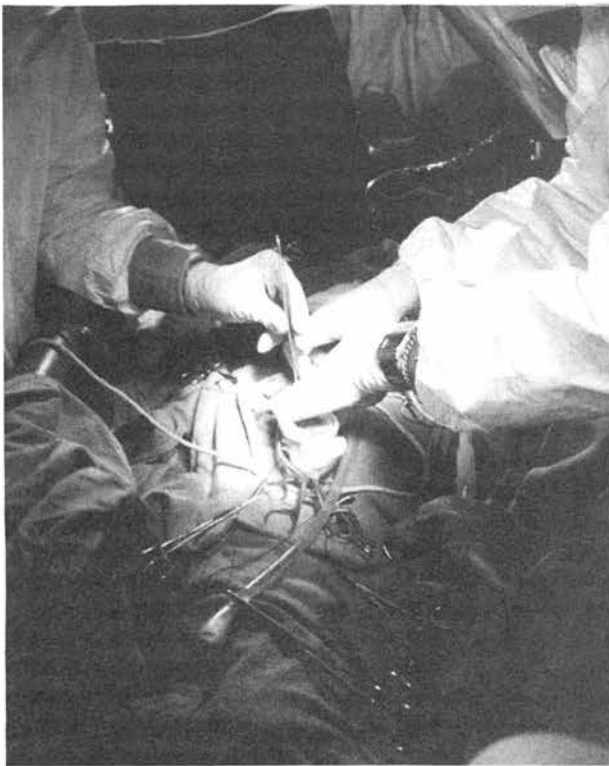


Photo: Carlos Mondragón

Work on the femoral cutdown is proceeding well. Mike Darwin is performing the surgery, with Hugh Hixon assisting.

were on site and ready to go. However, nearly 2 liters of IV fluids had reversed Nick's shock and yanked him a good ways back from death's door. He even got out of bed for short times that day. It seemed we were in for an indeterminate wait, but after the scare, nobody was about to complain. Keith used a little of the time to check the calculations Max and Tanya had worked out on the transport medications against a medication spread sheet he had created the week before, and all were right on.

The team used the time to check over readiness, make final preparations, and to upgrade our safety precautions to reduce the risk of transmitting Nick's HIV and/or associated infections to the Alcor team that would be caring for him.

Mike sent out for puncture-resistant nitrile rubber gloves and fluid-barrier Tyvek jumpsuits with integral shoe covers. These were added to surgical masks, full plastic face shields, and conventional latex surgical gloves which we normally use for suspensions. (The nitrile rubber gloves were discovered to work well as "liners" under conventional surgical or exam gloves, which could be discarded as they got dirty). Much credit goes to Paul Wakfer who took the initiative to run down these items at the last minute. Paul also took the Cryovita van (backup for the am-

balance) out and located a replacement tire for a blown spare.

Nearly at the last minute, Keith suggested adding pool chlorine to the MALSS ice bath to reduce the infectivity of the ice water which is pumped over the patient. The ice water, contaminated with body fluids, invariably splashes on anyone standing close to the cart. Paul went out and found some at about 8:00 p.m. the night before the suspension began.

If these precautions seem excessive, let us assure you they are not — especially three months later when you are getting your HIV status checked! Those on the team with medical backgrounds are comfortable working with AIDS patients giving day-to-day care without gloves or masks except

when handling body fluids (when gloves are required). However, a MALSS-supported transport is *not* your normal day-to-day situation. We are performing invasive procedures under field conditions using sharp instruments and in the presence of many gallons of splashing contaminated fluids. We are also working

with volunteers, and few of them have extensive medical training. A high level of precautions is in order to safely conduct these suspensions. Incidentally, we used the new sample collection method inspired by the last suspension when a team member got stuck (not an HIV-positive case). This greatly reduced the number of contaminated sharps to which team members were exposed.

An added precaution we took was the prophylactic administration of AZT to the entire suspension team during the period of potential exposure. While chronic administration of AZT to health care workers at risk for exposure to HIV is not warranted because of the serious side effects of long-term use, it is acceptable to use it for an acute situation where risk of exposure may be high. AZT is used as a prophylaxis against HIV for health care workers with known exposure. It is even more effective if the drug is already present when the exposure occurs. Fortunately, our precautions were effective and we were lucky. We had no incidents of exposure and there was no need for anyone to continue the AZT prophylaxis for the recommended 30 days following a needle stick or conjunctival (eye) exposure. (Whew.)

By Tuesday evening it seemed unlikely that Nick was going to be in dire straits for the next 12 hours or so. We were very short of bed space, so half the crew went back to Riverside that night, and the rest of us found places to spend the night. NOTE to transport team members: consider ad-



Photo: Carlos Mondragón

The cutdown is drawing to a close. Transport to Riverside is about to begin.



Photo: Carlos Mondragón

Hugh Hixon, Keith Henson, and Leonard Zubkoff complete preparations in the O.R., just prior to surgery.

ding an air mattress to your overnight kit!

Early the next morning we reassembled to move Nick to a downstairs bedroom which could be accessed by a gurney, but that was called off because he was in too much discomfort to be moved. Nick continued a slow decline in vital signs all day Wednesday, and by that evening it seemed likely that he would not make it through the night. All of us tried to get a little sleep that evening, but not many were successful at it. About midnight Jim and the nurse on duty decided Nick (who was again in deep shock and completely unresponsive) had under an hour to go, and (to minimize ischemic time) we were gathered to move him near the MALSS cart.

The logistics of moving our patient downstairs resulted in more discussion, arguments, and testing than any other aspect of the whole transport. (Mike missed this because he was in the garage priming the MALSS cart.) Keith's suggestion of using a gurney was tried with an empty gurney, but the required 70-degree angle looked so scary that nobody was willing to be a test subject. Hugh's suggestion of a fireman's carry was ruled out because a slip on the carpeted stairs might seriously hurt both the patient and the carrier. We finally tried and settled on Carlos's proposal, with Max on one arm, Paul on the other, Hugh taking Nick's feet under his arms, and Keith holding his head. We got him downstairs without any problems (good suggestion, Carlos), onto

the gurney, and (in our white Alcor lab coats) wheeled him up the street into the garage. Then we all got into face shields, double gloves, and the Tyvek "bunny suits." Tyvek, incidentally, is the tough, water-resistant material used for floppy disk sleeves and Federal Express envelopes.

The nurse, who was extremely supportive and competent, had called it close. Nick (with Jim holding his hand to the end) quit breathing and experienced cardiac arrest about half an hour after we got him into the garage. We used a standard hospital sheet carry, picking him up on the bottom bed-sheet and going in over the foot end of the MALSS cart. HLR support was begun on him within less than 60 seconds. Unfortunately, although circulation was promptly restored, Nick had vomited (without it being evident) a small amount of blood-derived material looking much like coffee grounds. This blocked Arel's attempt at placing the PTL

airway (a device which had been purchased some time ago by Mike for evaluation, but which had never been used). Seeing her difficulty, Mike cleared Nick's airway of vomitus, tried to position the PTL airway, failed, and then managed to get a backup Esophageal Obturator Airway (EOA) in place. Unfortunately we did not have an Esophageal Gastric Tube Airway (EGTA) in the emergency response kit. A disadvantage of the (older) EOA is that it has no passageway for a tube to neutralize stomach acid with Maalox or to place a temperature probe.

A disadvantage of both the EOA and the EGTA is that they both require a mask. The relatively high airway pressures generated by Heart-Lung Resuscitators makes holding the mask on (in a spray of ice cold water) a very painful task, mostly borne by Arel who was spelled by Max and Paul. Added practice with the PTL might help to solve this problem, since it does not require a mask.

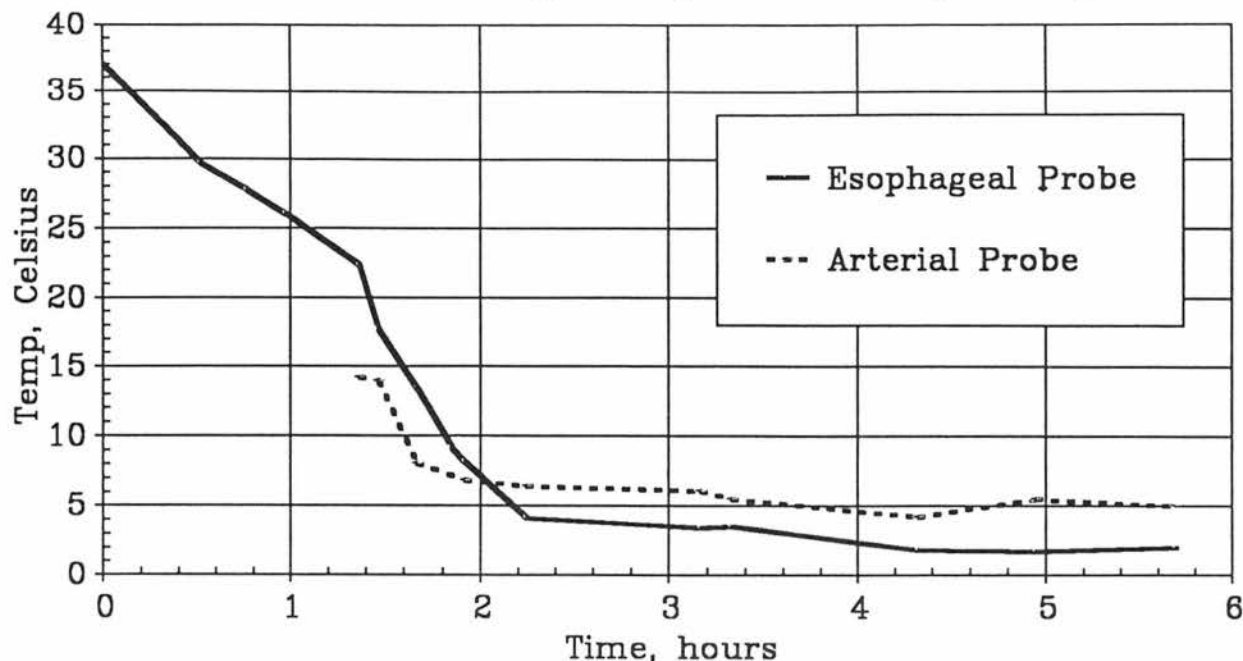
Arel suggested that next time we have a large bore-suction line available to handle respiratory emergencies, and Mike adds



Photo: Carlos Mondragón

Our contract surgeon begins the median sternotomy, with Hugh Hixon (left) assisting.

A-1260 Cooling Temperatures (Transport)



that the bag-valve respirator should be set up with a conventional mask to facilitate prompt respiratory support in the event there is trouble placing an EGTA, ET-tube, or PTL airway. Early airway management has turned out to be a major problem in several cases. Arel was sore up to the shoulders for several days from holding the mask on, but after the quickly-solved initial problems, the patient was well oxygenated, with the end-tidal CO₂ monitor showing a 3% to 5% reading on each breath: the best obtained so far. (About 5% CO₂ is expired by a normally perfusing and respiring person!)

Tanya administered the transport medications through a central venous catheter which had been left in place for this purpose. After administering the initial medications, Tanya went back to taking notes, with Mike dealing with the IV drips. Mike was having difficulty getting the dextran into the patient, and wanted to proceed with the femoral cut-down as soon as possible, so he asked Leonard if he would administer the remaining dextran. Since Leonard had no experience with this, Mike quickly explained the procedure of first filling the syringe through a 3-way valve, then turning the valve the opposite way and squeezing the plunger (more sore muscles) to force the dextran into the patient. He also explained to watch carefully for air in the IV line; Leonard thought he was pointing

to the opposite (mannitol) bag from the correct one, and began watching the wrong bag.

When he completed the dextran and shut off that line, Leonard reported that the dextran was complete. Mike asked him to start the other bag, which was apparently already hooked up. Leonard checked and found that it was already started, and reported this to Mike, assuming that someone else had started it, and was responsible for watching it. Because Leonard had not had training on this subject (not to mention that he was busy watching and changing oxygen cylinders), he missed understanding that the responsibility for the medications was being handed off to him, and nobody noticed at first when a pneumatically compressed IV bag started to pump air into the patient. Fortunately Tanya had removed most of the air from the bag prior to its being hung up, so at most a few cc's of air got into the patient. However, this experience reinforces the opinion that note-taking is too complex to combine with any other task, and that IV medications *must* be monitored by a trained person until they are turned off.

Although the intent was for Hugh and Keith to do the femoral cut-down, their inexperience with the prep and drape phase (inadequately practiced on pigs) slowed them down so much that they turned it over to Mike. Mike went on to do the femoral cut-down with Hugh assisting and

Keith handing off instruments. (The first thing they ran into was a set of arterial branches gnarled like tree roots.) Several sessions working with pigs made it possible for Keith to anticipate when instruments, suture, or heparinized saline would be needed next, and had also sharpened up Hugh's surgical skills. From arrest to going on bypass required 80 minutes, not as fast we'd like, but better than last time (105 minutes) and the record so far. Oxygenation and perfusion during HLR support was excellent, and the patient had a strong femoral (groin) pulse (as a result of the Heart-Lung Resuscitator support), which made it easier to do the cut-down. The patient's temperature was 22.3°C at the time bypass on the MALSS was started. This works out to a drop in temperature of 0.18°C per minute — excellent for HLR-supported surface cooling, though this is largely a function of patient mass/surface ratio.

Cooling to washout temperature went both smoothly and rapidly. Mike had installed an extra heat exchanger in the bypass circuit (in addition to the one on the Bentley hollow fiber oxygenator), and switched to a higher output pump for delivering the ice water to the heat exchangers. This resulted in a cooling rate of 0.47°C/min. When Nick's temperature reached 10°C, washout with Viaspan began. This procedure took about 7 minutes and (with large bore lines for the



Photo: Carlos Mondragón

The surgery complete, Tanya Jones begins the periodic drawing of fluid samples for analysis.

Viaspan this time) went very smoothly. Blood washout was deemed excellent in the field and confirmed upon arrival at the Alcor facility: Nick's hematocrit was 1%, indicating that about 98% of his blood had been washed out.

At 5:01 a.m. we shut down the pump/oxygenator on the MALSS in order to safely load it and Nick into the ambulance. At that time Nick's esophageal temperature was 3.5°C (he could have been kept off bypass safely for hours); he had cooled approximately 34°C in 3 hours and 20 minutes — a powerful testimony to the effectiveness of the portable ice bath and MALSS-supported cooling. Within a few minutes after Nick was loaded into the ambulance, clean-up in the garage was completed, all the support gear was loaded into the Cryovita van and assorted personal vehicles, and transport to Riverside was begun. The ambulance arrived at the lab at about 7:00 a.m. Keith and Arel (who had dropped off Max and picked up breakfast) made it by about 8:00 a.m.

Since there would be about a six-hour gap before the contract surgeon could get

there, most of the team headed off to get some badly needed sleep. Even though Keith had not slept at all the previous night, he did not feel like trying to sleep, so he remained awake to monitor and operate the MALSS. By that time Nick was on intermittent (10 minutes on, 20 minutes off) low-flow bypass to minimize the risk of cold-perfusion-associated-edema. Intermittent circulation of the Viaspan has been found to be important to supply tissues with needed oxygen and glucose, remove wastes, and control pH. Initially Hugh was going to operate and monitor the MALSS cart, but he was in worse shape than Keith, so he headed for bed. This was Hugh's first transport-team leadership, and he had gotten little sleep since days before it started from worrying about all the things which are needed and which can go wrong.

Mike left Keith with instructions to check pH once an hour and adjust with bicarbonate as required. Keith decided to check glucose as well, located a test kit, found the level to be low, and (following the directions in the transport manual) adjusted the glucose level. This was keeping Keith as busy as a one-armed paper hanger, so it was a great relief to him when Paul came back in to help after a quick trip home for a wake-up shower. About the time Paul came in, Keith stuck a clamp on the wrong line (no harm to the

patient, thank goodness) and opened a seam on the oxygenator, spraying a couple of hundred cc's of perfusate on the floor. Arel later made a suggestion of taping the lines with stripes of narrow-gauge tape: red for arterial, blue for venous, and green for the bypass line. It might not prevent all accidents, but it would sure help dead-tired people. After cleaning up the mess, Paul and Keith checked with each other when they changed the clamps.

Paul and Keith had problems both with measurements and with keeping the ice water flow ice-cold in temperature. Near the end of the MALSS support they moved the esophageal probe, and the reading dropped from 2.2° to 1.5°, more likely representing the patient's core temperature. The arterial probe must have been off by about 5°, because the arterial temperature (after going through the heat exchanger) had to be lower than the patient's core temperature. The readings were still very useful: they could see small rises in arterial temperature and take steps to correct it. The heat-exchanger water flow kept channeling between the pump and the return line, and required constant stirring and fiddling to keep the right level of water and enough ice in the cooler chest they were using. They kept at it for about 6 hours, until the rest of the crew returned, both rested and fed, and the contract surgeon showed up.

Three problems should be mentioned. First, the glucose test kit was missing the calibration strip for the meter, so the test strips had to be roughly read by hand. Second, due to unfamiliarity with procedures, and a failure of communication (side effect of a lack of sleep), no analysis samples were taken during the long period of low flow. Last, we ran one oxygen cylinder out, and while it did not hurt the patient, it was not noticed for some tens of minutes. Oxygen flow should be read with each temperature check.

Suspension phase:

Hugh Hixon, *Surgical Assistant, Blood Gases, Housekeeping*
 Mike Darwin, *Oversight, Burr Hole, Cephalic Isolation, Housekeeping*
 Ralph Whelan, *Perfusionist*
 Mike Perry, *Cryoprotectant Ramp Technician*
 Tanya Jones, *Scribe, Sample Taking*
 Arel Lucas, *Logistics Support, Housekeeping*
 Keith Henson, *CPA Concentration Determinations, Housekeeping*
 Paul Wakfer, *OR Circulator*
 Carlos Mondragón, *Records, Transportation*
 Leonard Zubkoff, *OR assistant, Cooldown Preparations*
 Mark Connaughton, *pH and Blood Gas Calibration*



Photo: Carlos Mondragón

The cryoprotective perfusion ramp has begun. Perfusionist Ralph Whelan monitors pressure in the perfusion circuit.

Nick was moved from the MALSS cart to the operating room table. With Hugh assisting, surgery to access the heart was seemingly uneventful. Arterial and venous cannulas were placed, Mike did a burr hole using the DuPuy pneumatic burr-hole tool. This time he did not open the dura. Brain swelling or shrinking was assessed by depressing the dura with a blunt instrument to "sound" the cortical surface, and observing the dura in the burr-hole for being flaccid or bulging. It seems that the profuse leaking of perfusate observed in previous well-supported cases was due to cutting nearly invisible vessels in the dura, not (as Keith had speculated) from the brain surface itself. This was the first time the DuPuy was used in a suspension and it worked very well, making a small hole in the skull in a fraction of the time it took to open a hole with a conventional hand drill. Observations of intracranial pressure were consistent with low injury patients: low pressure and some shrinkage of the brain during perfusion.

While all of this was going on, Arel made a food run. Later she and Keith got

busy cleaning out the MALSS cart. They used a lot of Clorox, and this time the vacuum system got checked.

With surgery completed, Carlos took the surgeon back to the airport, and Ralph started the perfusion ramp. After a quick lesson, Keith was put on measuring perfusate refractive index — which converts to a measurement of the level of cryoprotective agent going into and coming out of the patient. From the start, the computer model and the measured results were not agreeing. Dr. Perry was called over to see if anything odd was going on with his program, but it seemed to be okay — reality was out of adjustment. Early measurements indicated that the glycerol concentration was not increasing as rapidly as predicted and that we might not reach target.

The reason for this was not apparent until the conclusion of perfusion, and after cephalic isolation. At that time we discovered that the umbilical tape that the contract surgeon had used to tie off the aorta (so that the body did not perfuse) had not completely closed off flow — with the result that the patient's body had partially perfused! This was a potentially serious problem, in that the perfusate volume for neurosuspension patients is less than that used in whole body cases. We now know better, and in the future only metal (Satinsky) occlusion clamps specially designed for closing large vessels will be used for neurosuspension isolation.

Fortunately we came

very close to the minimum target glycerol concentration of 4.0 M (the final venous reading was 3.86 M or 27.84%). We just reached this concentration with the last drop of glycerol. Hugh was running blood gases, and we were pleased to see that Nick was using oxygen (as determined by the arterial-to-venous oxygen differences) at levels comparable to those observed in our canine total-body-washout animals cooled to similar temperatures and subsequently resuscitated!

About an hour before ending the cryoprotective ramp, an inquiry by Mike led to the realization that nobody had been assigned to get dry ice. The only source at that time in the night was forty-five minutes, so Carlos took off to get some. He made it back in time, but in the meantime Mike and Leonard had rigged a way to get cooling with the Silcool oil started using liquid nitrogen.

During our efforts to reach the target glycerol concentration another problem surfaced, one which really requires an immediate fix. During early cryonic suspensions it was discovered that when glycerol concentrate is added to the recirculating system (the perfusate being pumped through the patient), it tends to stratify; i.e., it sinks to the bottom of the reservoir and ends up being pumped into the patient



Photo: Carlos Mondragón

Keith Henson, having forgotten to look as busy as he was, gets nabbed for glycerol concentration analysis.

without being adequately diluted. (Glycerol is the very best available cryoprotectant, but very high glycerol concentrations are used to *dissolve* some tissues!) This problem was solved (we thought!) by continuous mixing of the perfusate with a magnetic stirring bar.

Unfortunately, if the reservoir level drops too low, the stir bar creates a vortex which sucks in air and fills the perfusate with micro-bubbles. This happened during Nick's perfusion, though — fortunately — the in-line arterial filter/bubble trap caught the air. However, we cannot rely on this in the future and several (patentable?) suggestions have been put forth on how to eliminate this problem. A decision has also been made to acquire (as soon as we can locate one) an air-bubble detector for use on the circuit. Operating room perfusionists have had bubble detectors for so long that few of them would willingly pump a case without one.

Cephalic isolation has been greatly improved due to the introduction of new tools by Keith and Mike. We now have this procedure down to a fraction of Jerry

Leaf's best time. After trying umbilical tape (which proceeded to untie itself), Mike found cable ties to be an efficient way to occlude (tie off) the esophagus and trachea. This goes a long way toward maintaining a clean surgical field during cephalic isolation.

Cooling to -79°C was started at about 11:00 p.m. After cooling was started, the grueling and seemingly endless process of cleaning up began. About this time Mark Connaughton came in and calibrated the blood-gas machine so we could try to make better sense out of pH data that did not agree between two machines. Cleanup was fairly well completed by about 2:30 a.m., though there would be a lot of work done over the next few days in restocking, re-ordering, and of course patient cool-down and subsequent transfer to liquid nitrogen storage.

The final result was that this suspension ranks among our very best to date. And while there were plenty of new surprises and problems of every imaginable sort, it is fairly clear that the most serious problem (nearly having the patient

deanimate with us hours away) was more the result of inadequate pre-suspension medical evaluation than lack of preparation.

Organization and attention to detail need a lot more work, and we are really going to have to train some of the suspension team members (in addition to Mike) as backups to do the cardiac surgery. Emotionally, suspensions are about as rough on people as can be imagined, but there was great (and effective) effort by all concerned to be more supportive of each other. Sadly, we have to expect to be doing more HIV cases as time goes on and Alcor grows.

Mike Darwin wishes to add his thanks to all involved for allowing his participation in the suspension, and his special thanks to Arel Lucas for her constant and invaluable support and to Paul and Maureen Genteman and Brenda Peters for their assistance and support. Keith adds that *he* is responsible for the harshest presentation of our problems in this article.

Analysis of the Subscriber Questionnaires

Paul Wakfer

About a year ago, at the suggestion of Alcor suspension member Naomi Reynolds (who also supplied many of the questions), a questionnaire was enclosed with each copy of Cryonics sent to subscribers who had not become suspension members. Here, at last, is an analysis of the replies to that questionnaire.

Method of Analysis

The questionnaire was designed as a set of 20 questions each concerning a possible reason why the respondent had "not yet decided to become an Alcor suspension member." Answers were entered by circling:

- 0 for "not a factor"
- 1 for "somewhat important"
- 2 for "very important"
- 3 for "main reasons"

Having no contact with, or guidance from, the designer(s) of the questionnaire, it seemed to me that the most natural method of analysis was simply to use the number circled as a weighting of each response and to calcu-

late a "response evaluation" for each question by averaging these weightings for each question. The most common problem in the implementation of this method was that a few respondents had chosen not to answer all the questions. After some consideration, I decided that the best method of handling this was to omit any null responses to individual questions from the total to be averaged over. In addition, there was room at the bottom of the questionnaire for replies to:

1. "Other (please specify)"
2. "Do you have any comments or suggestions that would help us to get you or others like you to sign up?"
3. "My age is ____ years."
4. "I first heard of cryonics ____ years ago."
5. "My sex is ____."
6. "I first heard of cryonics from ____."
7. "If you wish, you can provide your name below."

Miscellaneous Facts

1. 475 questionnaires were sent out; 66 were

completed and returned.

2. Of those returned, 9 were from females, 57 from males.
3. 26 chose to provide their name.
4. 3 respondents were already signed up with a different organization.
(This question is not included in the analysis below and their answers to other questions are not included in further analysis.)
4. 65 respondents supplied their age. Average 36.7; low 16; high 75.
5. 62 reported the time since first hearing of cryonics. Average 11.7 years.

Response Evaluations (Highest to Lowest)

In order to interpret these results, bear in mind that the vast majority of responses to each question were 0. (In fact, of 1105 individual responses 761 were 0, ie. not a factor). A possible interpretation for this phenomena is that for each respondent, only a few of the items on which they were queried, were a factor in their decision to not sign-up. It is for this reason, that the response evaluations are small numbers.

Question	Value
I can't afford the insurance	1.39
I can't afford the sign-up fee	1.26
I can't afford the yearly dues	1.14

I'm young and don't expect to need cryonics soon	0.87
I live too far away for Alcor to reach me soon enough in case of an emergency	0.80
The odds that cryonics will work aren't high enough (there's no guarantee)	0.73
I'm not certain that cryonics is a good idea	0.61
I don't have confidence in any existing cryonics organization	0.49
My spouse / family / friends strongly disapprove	0.43
I can't obtain the insurance	0.30
I'm too busy to sign up	0.28
My family and/or friends wouldn't be with me in the future	0.28
I don't think I could adjust / fit in / be happy in the future	0.22
There's too much paperwork	0.19
Because of business or professional reasons (I might lose standing or respect, my colleagues wouldn't approve)	0.19
I don't want to be part of future	

population/ecological/social problems	0.19
I haven't reconciled cryonics with my religious beliefs	0.16
I think cryonics is a good idea, but I'm not personally interested	0.15
A friend or family member got me a gift subscription	0.11

Where did you hear about cryonics?

Reading: Books	21
Magazines/journals	12
TV: Talk shows	4
News	3
Documentary	2
LA Law	1
unknown	4
Cryonicists named and unnamed:	9
Friends:	5
Family:	2
Other:	2

Other reasons for not signing up

Concerns about Alcor behavior and viability	7
Technological concerns	6
Improve career/family/economic status first	5
Personal and future concern	5
Need to know more	3
Proximity to Alcor	2
Uncategorizable others	15

Suggestions of what would get people to sign-up

Alter financing arrangements	7
You're doing a good job now	6
More/better information/media	5
Produce more/different research, better technology	5
Magazine modifications	4
Easier sign-up	2
Improve/demonstrate Alcor financial viability	2
Development regional centers	2
Uncategorizable others	6

Where Am I?

David Pizer

I was reading an excerpt from the State of California's Appeal against Alcor in our lawsuit against them. As you probably know by now, the State of California has been refusing to issue death certificates to persons who chose cryonic suspension, and Alcor has sued them for relief.

In their latest appeal they state: "Alcor argues that the right to determine the disposition of one's own body is a fundamental right based upon the concept of freedom of choice. However, such right must be balanced against the state's interest in regulating such method and place of disposition of human remains for the purposes of maintaining public health and safety and keeping proper mortality statistics."

Notice that they admit that we have a right to determine the disposition of our remains, then they try to take that right away from us. If we have a right, as they admit, then it seems that they should not be able to remove it from us.

Later in their appeal they assert the following: "Or, even more specifically, what would happen to such estate and assets if and when cryonic suspension is successful and the decedent is restored to life? Whose identity is the person to assume or be assigned

and what of the record of the person's death?"

These lazy bastards are worried that if cryonics works they will have to do some extra paperwork to modify their records, so they would rather we just be buried and rot. In other words, rather than do a little extra work, the California State Health Department would kill us!

After I finished reading their appeal and vomited several times, it inspired this little quiz:

Where Am I?

Help! I live in a land where we are all suffering from a deadly condition and the government wants me to give up any chance of survival. One of the reasons they assert is that my attempt for survival makes it too hard for them to keep statistics. Where am I?

1. Nazi Germany, 1943.
2. Rome, 200 AD.
3. Cave in France, 1 million B.C. (before the invention of writing).
4. Soviet Union, 1956.
5. State of California, 1992.

Help! I, and 5 colleagues, have just been arrested for trying to help an elderly lady avoid death. Where am I?

1. Anne Frank's attic, 1942.
2. Spanish Inquisition, 16th Century.
3. Dr. Semmelweis's lab, 1800s
4. Dora Kent suspension, Riverside California, 1988.

Help! I am being publicly humiliated for openly stating a revolutionary new hypothesis that will benefit mankind. Where am I?

1. With Galileo.
2. With Charles Darwin.
3. With Louis Pasteur.
4. With first man frozen, James Bedford.

Help! I have just been informed by the state that I can not spend my own money to try to save my life. Where am I?

1. Wall Street, 1929.
2. European Famine.
3. Fascist Italy, 1939.
4. Cryonics in California, 1992

Help! I have just been told by my government that I must do my duty and die. Where am I?

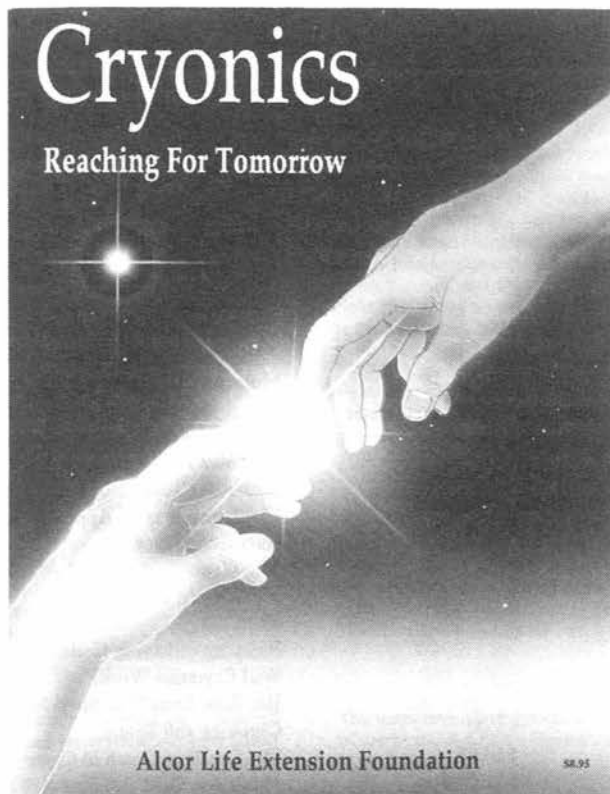
1. Kamikaze School, Tokyo Japan, 1942.
2. K.G.B., Lubyanka Prison, Moscow, 1954.
3. Crusades.
4. Jonestown, Guyana, 1970s.
5. California, 1992.

Cryonics Is. . .

Low-temperature preservation of terminal patients when medicine is unable to heal them. This treatment is called *cryonic suspension*. The goal of cryonic suspension is the transport of today's terminal patients to a time in the future when cell/tissue repair technology is available, and restoration to youth and health is possible — a time when freezing damage is a fully reversible injury and cures exist for virtually all of today's diseases, **including aging.**

It is our belief that if human knowledge and medical technology continues to expand in capability, people with conditions that would cause them to (incorrectly) be considered dead by today's medicine will be routinely restored to life and health. This coming control over living systems should allow us to fabricate new organisms and sub-cell-sized devices for repair and resuscitation of patients who will have been waiting in cryonic suspension.

There is already substantial scientific evidence available that current suspension techniques are preserving memory and personality — and that the repair and resuscitation technologies we envision will be developed within the next 50 to 150 years.



Non-members may call toll-free (800) 367-2228 or write (see reverse for address) and receive the book, *Cryonics – Reaching for Tomorrow* for free (regular retail price: \$8.95, member price: \$5.00.)

Alcor Is. . .

The Alcor Life Extension Foundation: a non-profit tax-exempt scientific and educational organization. Alcor currently has 17 members in cryonic suspension, hundreds of Suspension Members — people who have arrangements to be suspended — and hundreds more in the process of becoming Suspension Members. Our Emergency Response capability includes equipment and trained technicians in New York, Canada, Indiana, and Northern California, with a cool-down and perfusion facility in Florida and the United Kingdom.

The Alcor facility, located in Southern California, includes a full-time staff with employees present 24 hours a day. The facility also has a fully equipped and operational research laboratory, an ambulance for local response, an operating room and the world's largest and most technically advanced cryogenic patient storage facility.

All Alcor Directors and Officers are required to be full suspension members.

Call toll-free (800) 367-2228 or write (see reverse for address) for the free book, *Cryonics: Reaching for Tomorrow*.

Table of Charges and Dues

Sign-Up Package: \$100 (certain limitations apply; call 1-800-367-2228 for details)

Whole Body Suspension Minimum: \$120,000

Neurosuspension Minimum: \$41,000

Outside U.S. Surcharge: \$10,000

Annual Adult Dues: \$288.00

Additional Adult Family Member Annual Dues: \$144.00

Additional Family Member Child's Dues (under 15 years of age): \$72.00

Adult Student Annual Dues (must be full time student): \$144.00



You can tour the Alcor facility in Riverside, California under the expert guidance of the Alcor staff. The facility is open to small groups (15 people or less) who wish to learn how terminal patients are placed into suspension and how they are cared for at -320°F.

The Alcor tour also features a discussion of the scientific evidence that patients in cryonic suspension have a realistic chance of being restored to life, health, and youthful vigor as well as a fascinating exploration of the advances likely to come in the 21st century and beyond. The tour provides an invaluable opportunity for you to have your questions about cryonics and the prospect of an extended human lifespan answered.

The Alcor tour is free of charge. If you'd like to make arrangements, call (800) 367-2228.

Yes, I want to make cryonic suspension arrangements with Alcor. Please send me _____ Sign-Up Package(s).

Name _____ Age _____

Sign-up fee: \$100 per person.

Address _____

City _____ State _____ Zip _____ Phone _____

Payment enclosed (check or money order). Bill me.

I understand that an Alcor Sign-Up Coordinator will contact me at the above number.

ALCOR LIFE EXTENSION FOUNDATION
12327 Doherty Street
Riverside, CA 92503

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**For information on cryonics call Alcor:
1-800-367-2228 (toll-free, non-members only) or 1-714-736-1703 (members).**