

CRYONICS

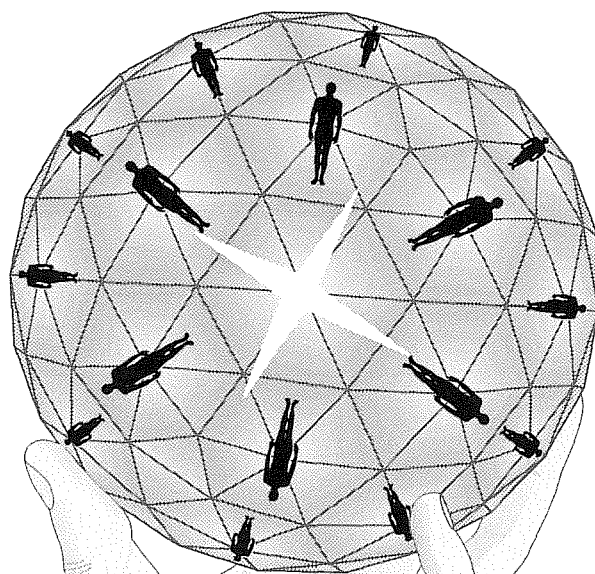
3rd Qtr, 1994

A PUBLICATION OF THE ALCOR LIFE EXTENSION FOUNDATION

Volume 15:3

IN THIS ISSUE:

Cryonics and Multiple Personality *Orders* By Ralph Merkle, Ph.D.



PLUS:

The Past, the Present, the Future, and Everything

Robert Ettinger's Presentation to the Sixth Annual Venturist Festival

ISSN 1054-4305

\$4.50



Alcor Foundation
7895 E. Acoma Dr., #110
Scottsdale, AZ 85260-6916
(602) 922-9013

Meetings

Board of Directors Meetings

Alcor business meetings are held on the first Sunday of every other month: January, March, May, July, September, and November. (The July and September meetings are on the second Sunday.) Guests are welcome. Meetings start at 1 PM. For more information, call Alcor at (602) 922-9013.

Sunday, September 4, 1994:

ALCOR
7895 East Acoma Dr., #110
Scottsdale, AZ 85260

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

Bay Area

Alcor Northern California meetings: Potluck suppers to meet and socialize are held the second Sunday of the month beginning at 6:00 PM. All members and guests are welcome to attend. There is a business meeting before the potluck at 4:00. The June meeting information is as follows:

Sunday, September 11, 1994:

Ralph Merkle and Carol Shaw
1134 Pimento Ave.
Sunnyvale, CA
Tel: 408-730-5224

After the business meeting and potluck there will be an *Introduction to Cryonics* talk and Q&A.

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

Colorado

A cryonics group will be forming in Colorado. Further information may be obtained by contacting Walter Vannini at 111 East Drake Rd, Suite 7046, Fort Collins, CO 80525, or 71043.3514@compuserve.com (email).

Midwest

Alcor Midwest is in full swing. It produces a monthly newsletter and holds monthly meetings. It has a state-of-the-art stabilization kit and responds to six states: MI, IL, OH, MO, IN, and WI. For meeting information or to receive the Alcor Midwest Newsletter, contact Brian Shock at (317) 769-4252, or 670 South State Road 421 North; Zionsville, IN 46077.

Boston

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

District of Columbia

Life Extension Society, Inc. is a new cryonics and life extension group with members from Washington, D.C., Virginia, and Maryland. Meetings are held monthly. 1994 meetings are scheduled for May 15, June 12, July 17, September 11, October 16, November 13, and December 11. Call Mark Mugler at (703) 534-7277 (home), or write him at 990 N. Powhatan St.; Arlington, VA 22205.

Las Vegas

Cryonics Laughlin meets the third Sunday of the month at 1:00 PM at the Riverside Casino in Laughlin, Nevada. FREE rooms at the Riverside Casino on Sunday night are available to people who call at least one week in advance. The time and place of these meetings sometimes changes, so before you come, please call Eric Klien at (702) 897-4176.

Directions: Take 95 south from Las Vegas, through Henderson, where it forks between 95 and 93. Bear right at the fork and stay on 95 past Searchlight until you intersect with 163, a little before the border with California. Go left on 163 and stay on it until you see signs for Laughlin. You can't miss the Riverside Casino in Laughlin, Nevada.

Southern California

The Southern California chapter of Alcor meets every month in an informal setting in one of our member's homes. The May meeting (on the fourth Sunday of the month) is now scheduled. For more information, call Michael Riskin at (714) 879-3994. The April 24 meeting will be at the home of Nance Clark at 4201 Via Marina in Marina Del Rey. For directions, call Alcor or call Nance at 310-306-3129.

England

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

The address of the facility is:

Alcor UK
18 Potts Marsh Estate
Westham
East Sussex
Tel: 0323 460257

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

Victoria Station has a regular train shuttle connection with Gatwick airport and can be reached from Heathrow airport via the London Underground tube or subway system.

People coming for AUK meetings must phone ahead—or else you're on your own, the meeting may have been cancelled, moved, etc., etc. For this information, call Alan Sinclair at 0323 488150. Near metropolitan London, contact Garret Smyth at 081-789-1045 or Garret@destiny.demon.co.uk, or Mike Price at 081-845-0203 or price@price.demon.co.uk.

Feature Articles

Page
9

Suspending "Mrs. Stone"

Tanya L. Jones

Page
13

Paperwork Counts!

Carlos Mondragón

Page
14

A Growing Perspective

Derek Ryan

Page
20

Cryonics and Multiple Personality Orders

Ralph Merkle, Ph.D.

Page
27

The Past, the Present, the Future, and Everything

Robert Ettinger

Page
33

Cooling Down

Hugh L. Hixon

Page
37

It's Not At All So Easy

Thomas Donaldson, Ph.D.

Columns

Notes from the President.....	7
<i>Stephen W. Bridge</i>	
For the Record.....	4
<i>Michael Perry, Ph.D.</i>	
The Donaldson Perspective.....	8
<i>Thomas Donaldson, Ph.D.</i>	

Departments

Up Front.....	3	Review.....	14
Letters to the Editor.....	2	Ads and Personals.....	6
Membership Status.....	39	Meetings.....	42

CRYONICS

Editor: Ralph Whelan

Volume 15:3 • Issue # 163
July (3rd Quarter), 1994
ISSN 1054-4305

CRYONICS is the Alcor
Foundation quarterly.

Subscriptions:


\$15/year U.S., Canada, and Mexico
\$20/year all other countries

Back issues are \$3.50 each.

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

Letters and Correspondence

Please address all editorial correspondence to:

=====	
Editor, CRYONICS	
Alcor Foundation	
7895 E. Acoma Dr., #110	
Scottsdale, AZ 85260-6916	

PHONE: (602) 922-9013 FAX: (602) 922-9027 EMAIL: ralph@alcor.org

Letters intended for publication should be clearly marked as such.

Contents copyright 1994 by the Alcor Life Extension Foundation, Inc., except where otherwise noted. All rights reserved. The opinions expressed herein are not necessarily those of the Alcor Foundation or its Board of Directors or management.



LETTERS to the EDITOR

Dear Editor:

I want to register a mild complaint about a couple of statements by Steve Bridge in the most recent issue of *Cryonics* magazine. I consider Steve a good friend, so my complaint, here, is on a friendly basis. I realize that he has tried to be fair in his description of the current situation, in which a splinter group of ex-Alcor members has created a new organization (CryoCare) which now competes with Alcor. In three areas, however, I think Steve's statements are a little misleading.

1. Steve suggests that CryoCare literature has included, or will include, "hints of incompetence, falsehood, and naivete" aimed at our competitors. This bothers me, because I'm the person who writes almost all the CryoCare literature, and I have scrupulously avoided mentioning anything about our competitors at all. Can Steve please tell me where I have implied anything negative about Alcor? I believe our literature has been much more critical of ourselves than any other cryonics group. Our first newsletter, for instance, is frank about the problem of earthquake risk and our slowness in setting up a Patient Care Trust.

2. Steve states bluntly that CryoCare has "raided" Alcor's membership. The word "raid" connotes forcible entry, seizure, and abduction. The reader may wonder what exactly CryoCare has done to deserve such an accusation. Well, so far, CryoCare has placed a couple of announcements on CryoNet (the computer network serving people who are interested in cryonics), has made presentations to some local groups of cryonicists, has sent out literature in response to information requests, and has contacted people whom we know personally or whose names have been made public (e.g. in postings that have appeared on CryoNet).

I suggest a comparison may be helpful, here. Once in a while, I get a phone call

from AT&T inviting me to use their long-distance phone service. I don't enjoy being disturbed by their salesperson, but I'm always willing to listen, because they may have an attractive deal to offer. This, to me, is how business works in a capitalist system.

CryoCare has done nothing more than this. In fact, we have done less. We haven't indulged in random "cold calling," and we haven't done bulk mailings.

Elsewhere in his article, Steve suggests that CryoCare has somehow "stolen" Alcor members. It seems to me, this underestimates the ex-members involved. Cryonicists are smart, independent people. They don't sit around waiting to be "stolen" or "raided." If they switch to a different organization, they probably have feisty reasons for doing so, especially since their future lives are at stake. Rather than blaming us for somehow abducting twenty percent of its membership, Alcor might examine people's motives for leaving. This, surely, is the crux of the matter.

3. Steve complains about a letter which was circulated by CryoCare regarding a "Transfer Agreement" between Alcor and CryoCare. This is a complicated matter, and some explanation is necessary.

The Transfer Agreement was devised to deal with the common situation where a person who wants to switch to CryoCare is unable to revise his or her financial arrangements at the exact same time that the membership documents are completed. The Transfer Agreement stated that if someone suffered a fatal accident AFTER becoming a member of CryoCare, but the person's insurance still named Alcor as beneficiary, Alcor would receive the insurance payout and pass it on to CryoCare, which would perform the cryopreservation. Conversely, if someone suffered a fatal accident BEFORE completing membership arrangements with CryoCare, but the life insurance had already been revised to name

CryoCare as beneficiary, CryoCare would receive the insurance payout and pass it back to Alcor, which would perform the suspension.

The Transfer Agreement was drafted by CryoCare and revised to satisfy some objections from Steve. Since the agreement imposed exactly the same obligations on CryoCare as on Alcor, I didn't expect anyone to object to it; but after Steve had signed seven of the agreements, Alcor's Directors warned us that for various reasons they disliked the wording of the

agreement and were not prepared to honor Steve's signature. They stated that if Alcor received an insurance payout on behalf of a member who had just switched to CryoCare, Alcor would return the money to the insurance company and would not pass it on to CryoCare. We were very worried by this development, so naturally we circularized all the people who had received the Transfer Agreement, to warn them that Alcor was planning not to honor it and urge them to complete their arrangements with us as soon as possible, to minimize the "danger period" during which they might lack any coverage. I think our actions were quite understandable, and I'm not sure why Steve objects.

On a more positive note, let me close by quoting a statement from one of Alcor's past presidents:

"This is official Alcor policy: Bickering and petty criticisms do not do any of our organizations any good. Alcor will engage in public criticism of other cryonics organizations only in terms of reporting that which they have chosen to disclose as news or publish as claims. We will avoid *ad hominem* jabs and inflammatory subjective language. We hope other organizations will adopt similar policies. Reasoned arguments and objective evidence is how people get close to what is true."

I found this statement from Carlos Mondragon in a posting that was placed on CryoNet. It happens to be precisely the model which CryoCare is endeavoring to follow. I hope that Steve, too, will be able to abide by this excellent policy laid down by his predecessor.

Charles Platt,
Vice-President, CryoCare Foundation

Steve Bridge responds:

Charles and I are human and sometimes see things from different perspectives. I have no desire to get into an argument with him over this situation, especially since my original article ("Life in the Time of the Schism" on page 12-13 of the April, 1994 issue of *Cryonics*) and Charles's letter were written over two months ago. I do think he read much more into my article than was intended or was actually visible. In fact, a couple of his statements are the product of total misreadings, which are perhaps understandable in this current era of competition.

Two brief clarifications:

1. I absolutely did *not* suggest that "CryoCare literature has included or will include "hints of incompetence," etc. To quote from my article, what I said was, "As you consider your options as an Alcor member, or for those of you who are considering which organization to join, you'll be reading and hearing many claims of greatness, competence, and scrupulous integrity pitted against hints of incompetence, falsehood, and naivete. Attempts to make one's own side look good and the other side look incompetent are normal as humans compete; but we ask that you take the time to talk to people on both sides before making up your mind."

I think it is pretty clear here that I expect individuals on *both* sides to exaggerate in conversations, letters and possibly in publications, since that is what humans do. I do not expect intelligent cryonicists to believe *any* individual cryonicist, including Alcor members, without comparing answers.

2. Charles states that CryoCare is not "raiding" Alcor or trying to "steal" its members. Maybe this wasn't the best way to phrase it and perhaps Charles himself is doing nothing like this. However, several times even in the past month (as well as before my article was published) we have received calls from Alcor members complaining that they have received unsolicited sign-up packages from CryoCare, that they have heard they were switching to another organization when in fact they weren't, or that they felt they were under extreme pressure from friends in CryoCare to switch. We have told them they were complaining to the wrong group and if they had a problem with CryoCare they should contact a CryoCare official (just as we want you to contact *us* if you have a problem with Alcor).

Alcor's policy is to work hardest on bringing in NEW cryonicists through interviews, speeches, publications and other public relations activities. I'm sure that is also the basic policy of CryoCare. We at Alcor certainly plan to continue that approach. There have got to be more than enough lovers-of-life out there that all six current membership organizations/service providers can prosper, if we can continue to find new ways to reach the public.

UP FRONT

BY RALPH WHELAN, EDITOR

Sometimes, editing *Cryonics* can be so inspiring that you can forget how much work it is. Occasionally the content comes together just right, and most or all of the features share not just a common backdrop (cryonics), but a common *wisdom* as well, and no matter what the ostensive thrust of each piece, you finish it feeling just a little bit clearer on how to achieve... well, how to *achieve*.

This kind of tone can be truly elusive in a magazine such as *Cryonics*, for in it we attempt to juxtapose our multifaceted, razor-edged viewpoints on precisely how to do what *for the life of us* needs doing. We feel angered and dismayed when our "comrades" fail to see things as we do. And we feel alienated from the vast majority of humanity, who look on perplexed beyond words by what we all *agree* on. Shouldn't we *expect* continual strife and animosity in such a situation, and just be glad that we so infrequently come to blows?

No, we shouldn't! That it "seems natural" does not make it sensible or desirable—witness our view of death. That it seems tolerable doesn't mean it can't topple our dreams—cryonics is anything but a sure bet. When you are fighting for your very existence, you don't just fight to win, you fight to *stop fighting*.

Several people touch on this motif in this issue, and all of them treat it well and differently. Most notable, though, is Ralph Merkle's "Cryonics and Multiple Personality Orders," which is the centerpiece of this issue. Much more so than his "Molecular Repair of the Brain" this article holds a powerful message for *cryonicists*.

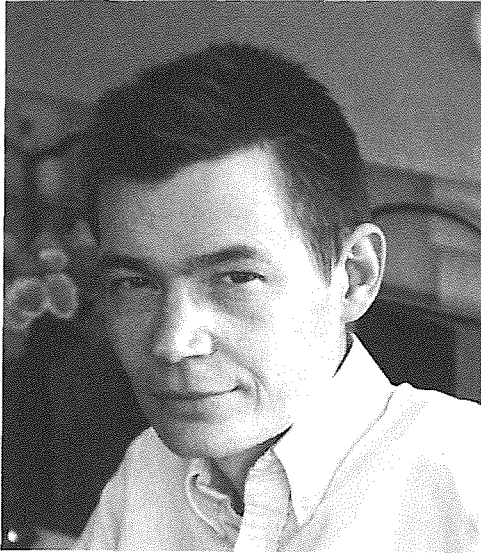
As this issue of *Cryonics* coalesced, so did a new and more productive "Personality Order" at Alcor. David Pizer—a Director and Treasurer of Alcor for many years—has joined the Alcor staff on a full-time *volunteer* basis, replacing me as Vice President. Dave's long-term focus in his new position is the facilitation of Alcor's new research program, as designed by Alcor's Director of Research, Dr. Mark Voelker. (More on that next issue.) Though I'm no longer Vice President, I'm still a Director and Secretary, and now full-time Director of Publications for Alcor. Look forward to a continuing upward trend toward a sharper, more professional (as well as more timely!) family of Alcor publications, starting with this one. To help Dave manage his new position, Director Michael Riskin, Ph.D., C.P.A. has taken over Dave's position as Alcor Treasurer, and therefore Director and President Emeritus Carlos Mondragón has replaced Dr. Riskin on Alcor's Patient Care Fund Investment Advisory Committee.

Same team. More productive line-up.

We hope you enjoy this issue!

About the Cover

The cover of this issue was designed by Ralph Whelan, using Aldus Freehand, Aldus Pagemaker, and some inspiration from M.C. Escher.



30 Years of

Immortality Immortality Immortality Immortality

The thought of eliminating death through scientific means is arguably the most profound idea in human history. When this idea is coupled with a procedure—cryonic suspension—that can be performed today, immortality becomes a possibility for the individual of today.

It was 30 years ago this year, on Jun. 5, 1964, that Doubleday published Robert Ettinger's *The Prospect of Immortality*, perhaps the most important one-day event in the history of cryonics. And this book was no flash in the pan; the author had been thinking about the main idea—freezing the newly deceased to possibly allow eventual reanimation—for many years already, and had already made a fledgling presentation of the idea in published form. (This was in his science-fiction story, "The Penultimate Trump," which appeared in *Startling Stories*, Mar. 1948¹.) And Ettinger, unlike most of those who were active in the early days, has continued in an

active role to the present, notable later achievements including publishing a second immortalist book, *Man Into Superman*, in 1972, starting a cryonics organization, Cryonics Institute, in 1976, and directing the development of a unique series of fiber-

glass-resin storage vessels for cryonics patients. Many who were unborn when *Prospect* was published have read his recent CryoNet postings on subjects ranging from philosophical issues in cryonics to his ongoing research with mammalian brain perfusion and cryoprotection. In June Pro-

fessor Ettinger (who taught college physics until retirement some years ago) spoke at the annual festival of the Society for Venturism, held at Don Laughlin's ranch near Kingman, Arizona. This talk (reproduced elsewhere in this issue) covers the genesis of *Prospect* and ranges over many other topics of interest in cryonics. In this column, intended as a complementary piece, I will consider the book itself, and some reactions it has provoked over the years. Let's begin with its publication.

A fledgling cryonics movement already existed, though no one would be frozen for several years. (The term "cryonics" itself was coined in 1965; earlier descriptive phrases included "the freeze program," "freeze and wait," and the imaginative, "freeze-wait-reanimate.") The early movement centered in Ev Cooper's Life Extension Society (LES), based in Washington, D.C. Though quite small—perhaps a few dozen in number—there was at least an audience able to appreciate the greatness of the work now being offered to the world. Cooper and Ettinger in fact had corresponded, and a decision had been made to create LES several months prior to the appearance of the book, after it was realized that publication would be delayed. When the book did appear, there was excitement and jubilation, which Cooper echoed in the third (August 1964) issue of the LES newsletter (see Figure 1).

What then, made this such a great book? In large part, of course, it is just the greatness of the basic idea it offers, of conquering death scientifically, something that, 30 years later, is still so radical it is hardly

mentioned in polite society, and is publicly disparaged.³ (Consequently, the world at large has yet to acknowledge the greatness of the book and you won't find it on any best-seller list.) The book, on the other hand, well deserves praise for its "lucidity and forceful writing." This is seen, right from the opening sentence in the Foreword, which cuts to the heart of the matter: "Most of us now breathing have a good chance of physical life after death—a sober, scientific probability of revival and rejuvenation of our frozen bodies." As explained in chapter 1, this rather startling conclusion rests on a *fact*, that bodies frozen and stored at cryogenic temperatures do not deteriorate significantly with time, and an *assumption*, that advancing technology should eventually allow resuscitation—and improvement—of an organism freshly frozen and stored at low temperature.

Much of the book's effectiveness lies in its clear identification of the various issues involved, and its organization around these issues. The "three great questions" considered are (1) whether the basic idea, freezing for eventual reanimation, is technically sound, (2) whether freezing and indefinite storage of individuals after death would be practical, and (3) whether eventual reanimation, assuming it possible, would be good for the individual and society.

It should be emphasized that the book, and cryonics generally, proposes to freeze dying individuals *at the time of death*, and to begin *right now by the best methods available*, and not to wait for breakthroughs or "until the process is perfected" before anyone is frozen. (All the wonders of tomorrow will not rescue those dying today, unless action is taken immediately to preserve them.) Thus it is crucially important to assess—as well as possible—the likelihood of eventual resuscitation of presently frozen organisms. The first several chapters of the book are largely devoted to this question, and to making the case that in fact reanimation is scientifically plausible and worth trying for.

Some formidable obstacles must be faced. No large organism has been solidly frozen and successfully revived. It is well-known that freezing extensively damages tissues. Something is known about this damage; some progress has been made in preventing it, but there is a lethal residual that no existing methods can halt or reverse. (The present tense here is appropriate; the situation today is not fundamentally different from that in the '60s, despite some progress.) On the other hand there are reasons for optimism about the *eventual* feasibility of resuscitation for those frozen with present-day (and some previous) methods. Freezing certainly preserves structure down to the cellular level and beyond, even

if damaged. Partial successes, in the form of revival of partially frozen mammals and organs—and smaller organisms entirely frozen—are numerous. Reasons for optimism surface too, when the nature of the freezing damage is studied closely. Even when a sizable tissue mass does not recover function upon rewarming, many cells are damaged little or not at all.

This brings up an important point: that techniques ought to become available for repair of damaged cells *from the outside*. (Presently cells must heal themselves, or die and disintegrate; but some limited work of operating directly upon cells, exchanging nuclei, etc. had been done,

and is noted in the book.) Many cells too could simply be replaced. In particular the brain, a critical organ, might be satisfactorily repaired due to the redundancy of the information it stores: "... it may well be that only a small percentage of the brain cells need escape with little damage; this may be enough for reasonably faithful reconstruction of the brain with freshly generated tissue."⁴ An interesting, worst-case scenario is imagined for brain repair: "... it is not inconceivable that huge surgeon-machines, working twenty-four hours a day for decades or even centuries, will tenderly restore the frozen brains, cell by cell, or even molecule by molecule in critical areas."⁵ This, it should be remembered, was written long before notions of nanotechnology became widespread. Today, informed by this newer outlook, we might replace the "huge surgeon-machines" with "vast, coordinated armies of tiny surgeon-machines"; otherwise the main points stand.

The book emphasizes that no claim is being made of having *proof* that resuscitation in the manner indicated, or any successful revival from a presently-frozen state, will be possible. With that in mind, though, and the evidence supporting the possible success, the option of freezing after death seems definitely better than its alternatives,

Figure 1: The following appeared in the August 1964 issue of the LES newsletter

BIG NEWS OF THE SUMMER:

Bob Ettinger's book *The Prospects of Immortality* [sic] was released by Doubleday June 5th, coinciding with a short serialization in *Cosmopolitan*, and a thoughtful article by Fred Pohl in *Playboy*. Quite a number of radio and TV stations carried and are continuing to carry interviews of Ettinger and discussions of the freeze-wait-resuscitate idea. Bob's book has been translated into French, and LES members report seeing it in paperback on the Paris newsstands.

The book itself is a marvel of lucidity and forceful writing. ...

Response ... has ... varied from enthusiasm to irritation with anything so revolutionary. ...

Ilean Rostand wrote a preface stating that the idea is solid. Gerald Gruman with his extensive background knowledge of the history of the concept of immortality wrote a second preface noting how great ideas such as this have often taken considerable time in taking hold. Penicillin, for example, is said to have taken 16 years between its discovery and its use.

Congratulations are more than in order. It is a great event toward the defeat of death.²

and worth the gamble. This position has, of course, been central to the cryonics movement since its inception.

With the technical problem considered, the book turns to practical matters. It is worth noting that essentially no cryonics facilities existed at the time, thus a certain speculation is necessary to support the position that such facilities *could* be set up; this was expected to happen shortly. (And it did, though only on a minuscule scale.) For the interim, persons interested were urged to make out a will specifying the desire to be frozen at death, and to obtain assurances of cooperation from family, friends, physician, executor of the estate, etc. Enough funds must be provided. Finally, it was hoped and expected that others interested in freezing would band together to form a "safety net" to see that the person in question remained properly frozen after death. In practice, as many will know, it has proved very difficult to establish facilities with the dedication and continuity to carry out long-term storage of frozen patients. As a consequence, many early suspensions terminated after only a few years. Much better success has been had with efforts since the mid-1970s, and some organizations *and patients* have now endured for 20 years or more, with good pros-

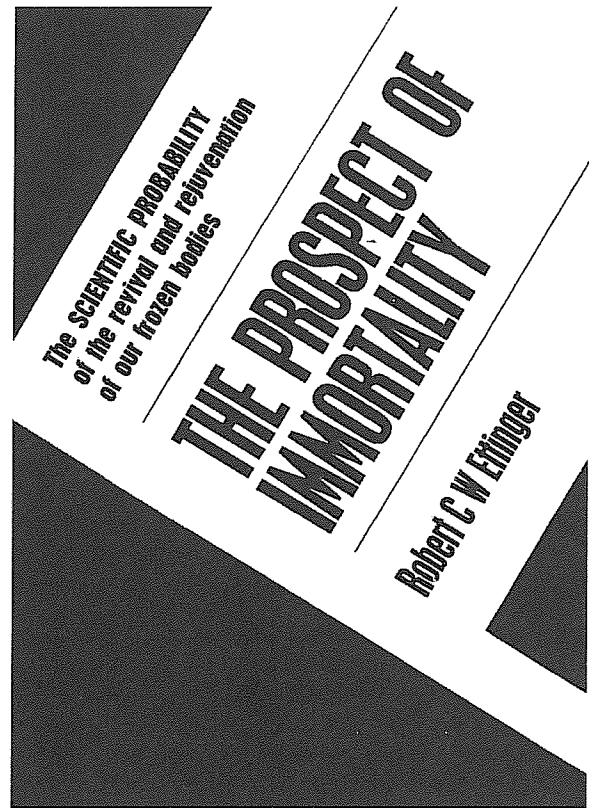
pects for continuing.

The closing chapters of the book are devoted to more philosophical issues, based on the important premise that, in addition to mere revival, future technology should allow curing of diseases and even rejuvenation or reversal of aging. In short, persons of today—even the sick, old and dying—could look forward to the possibility of a virtually endless state of youthful health. (This in turn could serve as a starting point for improvements leading to more-than-human existence, and life-styles scarcely imaginable.) Such hopeful prospects would

clearly lead to radical changes in society as we know it (it would become “as we *don't* know it” in major ways!). A very common reaction to the prospect of sweeping changes, of whatever nature, is a strong mix of fear, loathing, objections, and rejection. No small effort then, is devoted to meeting objections and reassuring the reader that the proposed changes would definitely be for the better. Everybody, then, should want immortality, and should work diligently to bring it about, starting at the basic level of individual survival, which importantly includes cryonics. This has convinced cryonicists—but unfortunately, the vast majority of humanity remains unconvinced. Though it has grown some, the cryonics movement is still very small. Very many more are perishing than being frozen, and much-needed research must be funded from limited, private reserves. Despite the favorable start, then, there is *much more* ground to cover.

After a great event occurs, eventually people start noting that a round number of years has passed. In the case of *Prospect* this is first noticeable in 1984, the 20th anniversary. (I find nothing about it in the 1974 literature, though by an interesting coincidence, in June of that 10th anniversary year the Avon paperback of *Man Into Superman* was published.) For the 20th anniversary there is a fine, short piece in *Cryonics* by Mike Darwin,⁶ thanking Ettinger for having the courage and genius to create his book, and noting that “Even powerful ideas take a long, long time to change the inertia of mankind’s whole way of looking at the world.”⁶ Another observation, “It has been a hard twenty years ... but WE ARE STILL HERE” can be extended. Though certainly not as tough as the first twenty, the last ten years have sometimes been pretty rocky, but WE ARE NOT ONLY STILL HERE, WE’RE *GROWING*.

The thought of eliminating death through scientific means is arguably the most profound idea in human history. When this idea is coupled with a procedure—cryonic suspension—that can be performed *today*, immortality becomes a possibility for the individual of today. This prospect then supersedes earlier approaches to solv-



The Prospect of Immortality is still in print and is available through Alcor for \$11.00. See the Order Form on page 40.

ing the problem of death through mystical means, and also the attitude of resignation prevalent among those who doubt the reality of supernatural assistance. For most people it is a very big mouthful to swallow—and it was all introduced through this book of 30 years ago. As Ettinger notes in his talk, we must now convince people that they *ought to* want and *do* want the immortal, post-human existence that science and technology appear to promise. Convincing them may be the hardest part of attaining it.

REFERENCES

1. *Cryonics* 12(5) 4 (May 1991).
2. *Life Extension Society Newsletter* 3 1 (Aug. 1964).
3. Will, G. “The last word,” *Newsweek* 7 Mar. 1994 74.
4. Ettinger, R. *The Prospect of Immortality* Doubleday 1964 (repr. Immortalist Society 1987) 29.
5. Ettinger, op. cit. 30.
6. “Twenty years of cryonics,” *Cryonics* 43 1 (Feb. 1984).

Advertisements and Personals

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

EXTROPY

The Journal of Transhumanist Thought #13
Boundless Constellations: The Emergence of Celestial Civilization; If Uploads Come First: The Crack of a Future Dawn; Utility Fog (nanotech); Two Questions for Extropians (Platt), response by More; Interview: Souls, Cyberspace, Sins, & Singularity; Sequential Neural Networks; reviews of *Good Mood*, *The Origins of Order*. \$4.95; \$18 for one year sub. (\$22 Canada; \$32/\$24 overseas air/surface) from Extropy Institute, 13428 Maxella Ave. #273, Marina Del Rey, CA 90292. E-mail: info@extropy.org

MARY NAPLES, CLU and BOB GILMORE
CRYONICS INSURANCE SPECIALISTS.

4600 Bohannon Drive, Suite 100
Menlo Park, CA 94025.
(800) 645-3338.

Venturist Monthly News promotes immortalist philosophy. For free sample write: The Venturists; 1547 W. Dunlap; Phoenix, AZ 85021.

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

Are you still healthy? Want to delay suspension? A book for users of *Antiaging Drugs* tells the good and bad of each one. Send for free brochure. *Periastron*, PO 2365, Sunnyvale CA 94087.



The Job's Not Over Until the Paperwork's *Done*



Every couple of weeks we get an inquiry about cryonic suspension from someone whose relative is dying or has just been pronounced dead. Many of these people have only a vague understanding of the purposes and limitations of cryonics. Most are constrained by finances or by legal considerations, such as other relatives who want more traditional dispositions. Almost everyone has a severe problem with the issue of *informed consent*. It is important for us to ask the questions: "How do we know the individual *wanted* this? How can we show we have not defrauded the person by promising things that are not possible or true?"

The legal issue of who decides about cryonic suspension is still muddled by the lack of specific legislation and regulations. Alcor's normal and preferred procedure for informed consent is for the individual member to read and sign a group of documents which provide very specific information about Alcor and cryonics, and about the limits of each.

While this paperwork can be a chore to work through, it is absolutely necessary in order to avoid misconceptions and conflicts. For example, many people think there must be guarantees that cryonics will work or that Alcor will revive them on a specific predetermined date. Some think that cryonic suspension itself will cure their diseases or perhaps that Alcor will act as Trustee for their estates so they can "Take it with them." Alcor's paperwork clearly points out that none of this is true.

If a family member is trying to arrange a last-minute suspension, the complications intensify. It is exceedingly rare for Alcor to approve a suspension arranged by a relative (especially postmortem) because the legal complications are so much increased.

Recently Alcor—for the first time ever—

was forced to remove a patient from suspension (see Carlos Mondragon's article "Paperwork Counts" elsewhere in this issue). This had been a last-minute suspension arranged by the patient's husband in 1990. Alcor's Board of Directors had approved the suspension arrangements because the couple had received the sign-up paperwork some months before and the husband had been attending cryonics meetings for years. The presumption of informed consent was strong for him and—absent other direction from his wife—he had the legal authority to direct the disposition of her remains. Unfortunately, a court later ruled that his wife had left countermanding instructions and had not been in a position to provide the informed consent which could have cancelled other instructions.

It is just such situations that make Alcor extremely reluctant to accept last-minute cases where the individual being suspended has not signed our legal forms. In fact, we require an additional \$25,000 over our usual minimums before we will consider

choice was unclear. And there is the moral issue: should we be in a position where we place people into suspension if they really don't want it? Even if we do think it is "good for them?" Always remember, just like a doctor cannot save everyone and so must concentrate his energies on those who can be saved, we must do likewise. All people who want or deserve cryonic suspension *will not* be suspended.

So don't wait!!!!

Does everyone understand this? It is bad enough when people who just found out about cryonics call us after a relative has died. In many ways it is worse when longtime readers of this magazine do the same thing—or have a relative call us later on *them*. You have the time and ability and knowledge to avoid this kind of crisis.

Cryonics is not very advanced. Hospitals do not perform transports or perfusions for us. State laws do not recognize the existence of most of the choices involved in cryonics. We do not have helicopters

poised to swoop in and rescue dying people or even attorneys posed to swoop in and handle all of the legal problems. For the foreseeable future, cryonics will be an endeavor for which you must be prepared and in which you must *participate*.

"State laws do not recognize the existence of most of the choices involved in cryonics. We do not have helicopters poised to swoop in and rescue dying people or even attorneys posed to swoop in and handle all of the legal problems. For the foreseeable future, cryonics will be an endeavor for which you must be prepared and in which you must participate."

such a case. And even then, *almost every time* we will say "No."

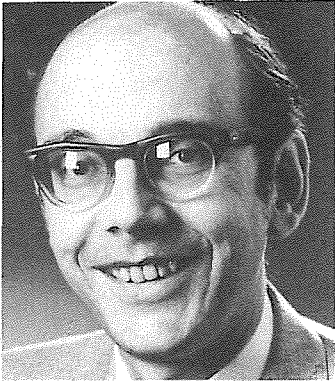
It may seem odd that a cryonics organization would turn down "business." But our first obligation is to the patients we already have in suspension. We have fought many court battles over the past decade to protect an individual's rights to choose cryonic suspension. But it makes little sense for us to risk the future of Alcor and the protection of the already suspended patients to take on a case where the patient's

Sign up *now*. Don't wait until the last minute, when we may have to say "No."

Paperwork Revision

Each suspension teaches us new ways to avoid problems—and new problems to avoid. Policies change over the years, new solutions are discovered, even the language changes. So once in a while we

Text concludes on page 39



The Effects of Immortality

I shall discuss here some of the effects, both current and future, that cryonics and immortality may have on us and human beings generally. I don't mean here any specific modifications or improvements to ourselves by new kinds of technology, nanotechnology or other, that we may someday create. Nor do I here take any position about the merits of such modifications. I mean the effects that lifting the simple burden of mortality would have on us and our behavior, even if we remain with the physical bodies and mind we have now. For if, on good grounds, we come to believe that we will continue for thousands of years, our outlook on many different issues would change greatly.

On *present* human scales these changes may take a thousand years to complete. Or then again, when substantial numbers of people have lived to over 100 they may have become history.

The very first change will come in our attitude to killing and war. I very much don't mean that we will cease to fight with one another, living in harmony ever after. I expect many struggles, and even massive wars, all of them resulting in very few or no actual deaths at all. Yet wars and deaths have been part of human history and prehistory for as far back as archaeologists have gone. How could such a change come over us?

First, if most people are over 100, there will be no more young men that old men can send off to war. And whether it takes 100 years or 1000, we will all become resistant to the cries that lead to war: the old have seen a great deal, and their heads will not be easily turned by any such cries.

Second, our threshold for deaths will go way down. Before WWII, Lewis Richardson, a British meteorologist and also a Quaker, did a study of wars. He felt, quite rightly, that we must first understand wars and killing before we moralize about it. He found two kinds, one a war of extermination (in which the sides were very unequal, and the "advanced" one treated the war as if it were the extermination of rats or mice) and the other kind, in which the parties were more or less equal. And for this second kind, his studies produced a fascinating statistic: they would *always* stop after death and injury rates had

reached 40%. (This statistic held true across 200 years of technological advances, nor did it matter just how the war ended). So what determines our threshold for death and injury? I believe it comes from our hopes for *future* lifespan; and so, if we expect to live thousands of years, that threshold will go way down. For many people now, they see themselves as risking nothing very valuable: they choose the excitement and danger of war against a slightly longer life, but only one of labor and misery. Yet if you expect to live far longer, you will quite reasonably believe that even a *present* life of misery will someday grow less miserable, even pleasant. You will learn a great patience.

Yet that's not the only change. If we expect to live for thousands of years, then many things we now think of as long-lasting and substantial we will see as transient compared to ourselves. Political parties, ideologies of all kinds, governments, nations, buildings, styles, fashions, fame, even scientific theories, all of these become *transient*. You are what is lasting.

This change gives an almost complete inversion of many values most people now have. How often have we heard, either in the eulogy of one of our fallen heroes, or the declared aim of a politician, scientist, or inventor, that he or she wanted to make something substantial to leave behind them? To do or create anything and expect it to outlast you would be absurd. Any group or nation that we joined we would expect to disappear while we continued on. They could not attract the patriotism and loyalty they now attract.

I don't believe this will cause us to cease producing science or art, but it would change our attitude to what we had produced. Not all science or art comes solely from a wish to make something lasting, even now (think of a firework display). Consider the Newtonian theory... or General Relativity today. To say that a physical theory or a piece of mathematics is "true" implies that it is long lasting, yet Newtonian physics lasted only 250 years before being superseded. All such achievements will be welcomed, but seen as provisional and transient.

This attitude may even *favor* scientific discovery: how often does it happen now that some major scientist fights to retain the

memory of his work when new ideas have begun to change it? Anyone who has ever been an academic will also know how professors try to found their own school of thought: rewarding those who go along with them, trying to cast out (not always successfully, or we could not advance at all) those with discordant ideas. Both ideas and inventions will be seen as *necessarily* transient. We have no good word to describe this attitude yet. It's not that we won't *want* such ideas, or take a frivolous attitude to them, but that we won't think of ourselves as bound to them in the same way many now do. They are tools that we pick up and use, and will drop someday for better ones, as we have almost abandoned typewriters for computers. (Though everything has its place: we still use the equations from Ptolemaic theory to work out where a star might be in our sky.)

This notion of transient creations compared to lasting human beings extends to literature also. Every book or poem will be approached not for what it may say to the Ages but for what it says to the person reading it. I am the one who is important: what does this poem say to *me*. Authors will write for specific audiences, with no pretense of universality. This implies, for instance, that the language used will become specific to the audience, and even the theme may become very special. Others outside may find the drama, novel, or poetry impenetrable; art would become very fragmented. (Yes, we will also see hypertext and other innovations, but the point still holds). I suspect that visual art will go through the same change. Its worth depends not just on what our eyes see but how we react to what we see, and those reactions can change.

Most especially, it's *not* that such art would glorify individuals. If you expect to live for thousands of years, you do not need glorification. But it would try to speak to your specific feelings and background: essentially to you and those similar enough to you. Both literature and visual arts would become a little like the letters (or drawings) we make for our friends, with no intention that they spread further; but at the same time very high skill and much thought might go into such works. Is this the end of all art? You decide.

Who tries to keep a fireworks display?

Suspending "Mrs. Stone"

by Tanya Jones, Suspension Services Manager

A less detailed version of this report titled "The Suspension of A-1206" appeared in The Alcor Phoenix, June 1994. —Ed.

The majority of cryonic suspensions occur with at least one day's notice of an Alcor member's deanimation, which generally allows time for reflection, planning, modification, and application of rather sophisticated stabilization procedures to tremendously variable transport operations. Cases which fall in the minority, those with little or no warning, have less flexibility in execution but provide a better platform for evaluating the efficacy of Alcor's emergency response system as it has been developed. The transport and suspension of member A-1206 was executed with but five hours between Alcor's notification that the member was seriously ill and the pronouncement of legal death. We responded, we suspended, and we learned.

One of the first lessons was that vacations should be avoided. At least six members of the Suspension Team were in Sunnyvale, California attending *Extro 1*, the first conference on transhumanist thought of the Extropy Institute. Everyone was studiously enjoying the very first presentation (*MATHEMATICAL IMMORTALISM: A PROGRESS REPORT* by Dr. Michael Perry, Suspension Team Member and Alcor's Patient Caretaker) when the call came in that an elderly New York member had been found by her son (an Alcor member) in an unresponsive state and was in the hospital after a late-night heart attack.

Over half the staff was in Northern California (Hugh Hixon, Tanya Jones, Ralph Whelan, Mike Perry, and Derek Ryan) when the initial call came at about 8:30am (PST) on Saturday, April 30, 1994. By 10:30am, "Mrs. Stone's" physician relayed to Steve

Bridge that the patient was in a coma and, given her age (91) and recent medical history, was not expected to survive the night. Mrs. Stone's application for cryonic suspension provided relevant information about her past medical history, including that she'd had a bout with breast cancer, an allergic reaction to gentamycin (one of the standard medications in Alcor's transport protocol), and, most important to the impending suspension procedures, she'd had a bypass operation about a decade earlier.

Within two hours of Steve's speaking with the physician, Hugh Hixon and I were being rushed to the airport by Keith Henson (who was also attending the conference) to catch the next flight to New York. Steve Bridge had arranged for Scott Herman to take Alcor's transport kit, custom shipping container, and supply of Viaspan™ (a blood replacement solution used commercially in stabilizing transplant organs) to the Phoenix Sky Harbor Airport, where they were awaiting shipment to New York. Additionally, the New York Transport Team Members had been notified of the impending suspension and dispatched to the hospital to await deanimation.

Once the stabilization equipment shipment and local emergency response had been coordinated, Steve's next step was to contact the New York City mortician who'd been contacted to assist with the transport. At about 1:30pm, the mortician and Steve had completed the negotiations regarding the use of the mortician's facility and services. They were discussing logistical details, when the mortician took another call. It was Mrs. Stone's son, calling to say that

his mother had deanimated and was awaiting removal from the hospital.

Hugh and I were somewhere over Nevada when this call came. After discussing several probable transport scenarios with Hugh, I asked Steve to stop the transport kit shipment to New York, as it

appeared unlikely that we'd use it. (We expected that no blood replacement would be possible due to the excessive clotting which occurs to people when their circulatory system shuts down, a decision based on the fact that Hugh and I were hours distant, and the local Transport Team members had not yet arrived at the hospital.) We could attempt the washout with the local equipment, but were expecting blood clots to prevent any significant circulation of the washout solution. With further consideration, we changed our minds—sending the transport kit was probably a good idea, as there were many items in it that were not in the local kit, and depending on how the circumstances developed, some of these items might be useful. Twenty minutes passed between these decisions, and they were poorly timed. The only flight which would get the kit to New York before late Sunday morning (this was Saturday) had been the plane from which the kit had been off-loaded, and it had just left.

Meanwhile, the New York Transport Team volunteers had been sent to the hospital with their transport equipment. Stan Gerber went straight to the hospital from his apartment in New York City, while Gerry Arthus and Curtis Henderson were traveling from Long Island. Gerry and Curtis were given permission by Steve to locate a back-up van for their equipment, as Curtis' van was old and possibly unreliable for long trips, but Steve also said that this wasn't critical, and that any search for a van should not delay the deployment of the equipment to the hospital. Gerry called one rental company who claimed to have a van imme-

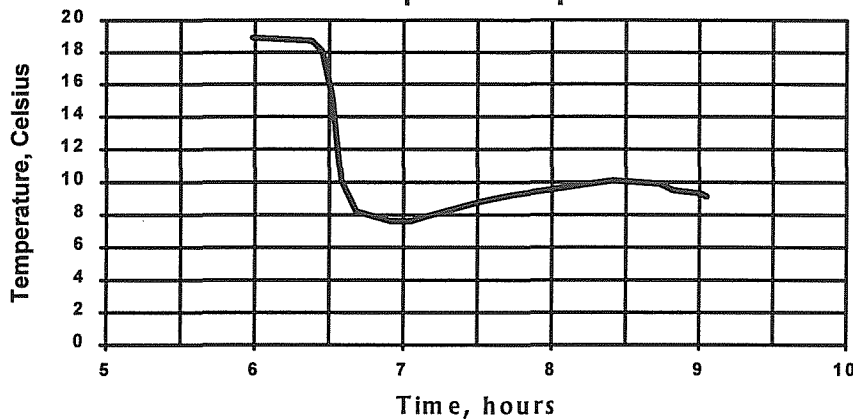


Jay Skeer (left) and Ralph Whelan prepare the perfusion circuit prior to the suspension



Hugh Hixon generates the arterial and venous glycerol concentration figures

A-1206 Transport Temperatures



diately available, so he and Curtis went to pick it up. Unfortunately, they didn't take the equipment with them, and subsequently, had to return to Curtis' home to pick it up when they found that the rental company was mistaken and no van was on the lot. This, in conjunction with the standard snarls of New York City traffic culminated in several hours delay.

Stan Gerber arrived at the hospital shortly after the patient was pronounced. The patient's physician had allowed the patient's son to pack her head in ice, and informed Stan that he could perform cardiopulmonary resuscitation (CPR) (which he did, manually) and administer the transport medications, but that the hospital would not provide him with medications from their inventory. Much to Stan's frustration, he had no medications with him, since the transport medications kit was still en-route with Gerry and Curtis.

The mortician arrived about an hour later and submitted the paperwork for the removal of the patient, which was then accomplished in short order. Upon arriving at the mortuary, Stan once again began manual chest compressions, and performed CPR (without ventilation, as our protocol requires) until shortly before the arrival of Gerry and Curtis at 8:15pm (EST). Stan had to stop CPR in order to head for the airport as Hugh and I were arriving. He was accompanied by the patient's son.

About the time Hugh and I landed at JFK Airport, Gerry and Curtis arrived at the mortuary. Once the equipment was unloaded, they began to implement the transport protocol. The mechanical CPR device was placed and started. An IV was in place, but no fluid could be pushed through the clotted line. Of all the transport medications, only Maalox could be administered at this time.

Shortly after Hugh and I arrived at the mortuary, we were talking with Steve Bridge and found that a problem which had arisen from our inability to ship the transport kit in a timely manner had been solved, while yet another transportation problem had been discovered. When I asked Steve to stop shipment of the transport kit to New York, I'd overlooked a reminder to keep the Viaspan™ and the patient shipping container on the flight. As a result, these items were also removed by airport personnel. Ten liters of very fresh Viaspan™ existed in the Florida facility, though, and was close enough to be available for our use in New York. It had already been shipped quickly by a local volunteer and was scheduled to arrive in New York about two hours after myself and Hugh. That's the problem which had been solved. The problem Steve found was that the Phoenix airport cargo department was not open on Sunday, and it seemed that no airline would schedule the shipping of human remains until Monday morning.

This unforeseen complication resulted in the patient's son beginning to search the phone directories for an air ambulance service which would transport his mother to Phoenix. These proved to be quite expensive, and no service had a plane large enough to transport the patient without refueling stops (which ultimately would prove a more time-consuming trip than taking a commercial airline). An additional difficulty was that the air ambulances con-

tacted would only accommodate one or no passengers, which would have left suspension-critical personnel in New York. Steve also began searching for an answer to this in Scottsdale, by contacting all of the airlines that operate at the Phoenix airport in hopes that an exception to the shipping schedule could be made. Given that this was late Saturday evening, the prospects for a timely resolution seemed slim.

Meanwhile, Hugh and I still had an ischemic patient to prepare for transport to Scottsdale, whenever that was to occur. Our options were limited. Shortly after arriving at the mortuary, I'd tried to administer the transport medications and also had little success. With the Viaspan™ on its way, we at least had the option of attempting a blood washout. We consulted with a cryobiologist about the probable extent of the ischemic damage (now nearing six hours) with and without the blood washout, and the effects that further delays (including shipping) would have on the patient's chances for a successful cryoprotective perfusion. We concluded that attempting the blood replacement would do no harm, as it would not delay the shipment (still scheduled for Monday) and might provide her brain with some protection if clotting didn't actually prevent washout.

At this point, it was suggested that we use vessels in the neck as our access points, as using these vessels might circumvent some of the major clots in her circulatory system. The mortician had agreed to perform this shutdown and had both the skill and confidence to do so quickly. As he proceeded with a shutdown on the right carotid, Hugh and I realized that using the carotids for this part of the suspension procedure would probably be a mistake. If we opened the vessels in the neck, they would have to be delicately repaired by the surgeon in Arizona—if they weren't repaired, we'd lose a major portion of the circulatory system feeding the brain, which would undeniably result in a lesser-quality cryoprotective perfusion for the patient. Fortunately, the mortician hadn't opened any of the vessels for cannulation, so that problem was avoided.

We then asked the mortician to proceed



Keith Henson (left) and Dr. McEachern cannulate the aorta and right atrium



After cooling to dry ice temperature, the patient is prepared for the final cooling phase

with femoral cutdowns, which he did. Just before 1:00am, we were able to begin the blood washout. Almost immediately, we were able to see that the flush was having an effect. Dark venous blood was exiting the femoral vein. The draining blood also contained modest clots which had retracted with the cooling and the passage of time, and which were then flushed from the circulatory system with the introduction of the Viaspan™. As the flush continued, we saw Mrs. Stone's abdomen distending. It was filling with fluid, probably leaking from the circulatory system through a ruptured gastric lining. Given the circumstantial problems already experienced by this patient, we were determined to continue the flush for as long as we could. By the time Hugh shut down the pump, about six liters had been flushed (generally, we use about ten), the draining venous blood had lightened markedly to a pale mauve, and some of the bruising we'd seen on the patient's body had cleared (indicating that some perfusion was being achieved).

It was during the washout that Steve Bridge called us with some *very* good news. America West Airlines had agreed to open their cargo department on Sunday to receive the patient, at the convenience of our schedule (i.e. the patient's arrival). Many of the airline's decision-makers had been out socializing on this Saturday night, but a sympathetic and determined airline representative arranged the authorizations we needed to get the New York airport to put our patient on the next available flight, and even reduced the time requirement for when we had to have cargo at the airport (usually four hours in advance of departure).

With myself, Hugh, and the patient now booked on a 7:30am flight, we had little time to lose in getting to the airport, even with the reduction in advance delivery requirements. The washout nearly complete, we were preparing to pack the patient for shipment, when we discovered some of the New York equipment missing. (The single missing container was later found to have been misplaced by a mortuary assistant.) We had no sealable bags in which to pack the ice for shipment. Sealable bags had become important with the removal of Alcor's shipping container from the flight to New York. Ice was essential, in this case, as the patient's temperature was still a high 9.1°C (all temperatures are rectal) a full nine hours after her pronouncement. (The slight increase in temperature shown by the accompanying graph indicates the beginning of the blood washout, and occurred because insufficient time was available to completely cool the Viaspan™.)

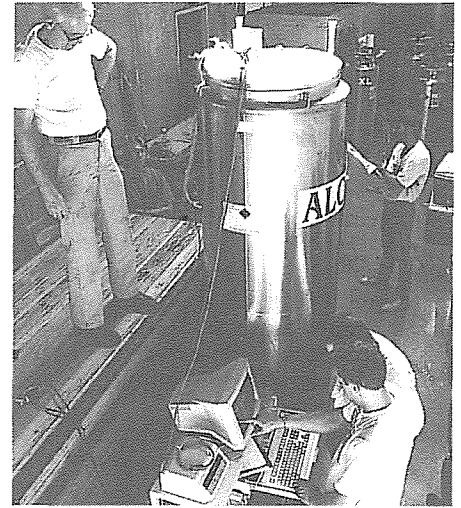
Unfortunately, no convenience stores were found to be open in Brooklyn at 2:00am on Sunday. The mortician, however, insisted that his container was watertight, and we relied on his expertise in this,

as we had few alternatives at this time. Ever aware of the encroaching deadline, we packed the patient, with the ice in the original bags into the container; surrounded it with insulating material, and secured all of this within an outer casing. Then we ran to the airport.

Almost exactly two hours prior to our scheduled departure, Hugh and I were perched uncomfortably in wire-frame benches at the airport when Steve paged to let us know that the ice bags in the shipping container had leaked, and that the patient wouldn't be allowed on the flight until the leakage was stopped and the container repaired. The mortician had picked up Mrs. Stone and was returning to his facilities where he, armed with more detailed information and new experience in shipping cryonics patients, was preparing to repack the patient for later shipment. (The mortician ultimately used a body bag, garbage bags, and twist-ties for the ice.) With our assistance being unnecessary (and indeed, more difficult to obtain with us at the airport) and the patient returned to the mortuary, Hugh and I took the scheduled flight to Phoenix, so that we could arrive before the patient and help with preparations in Scottsdale.

We arrived at the Alcor facility to find that preparations for the impending cryoprotective perfusion were well underway. Mike Perry was flying in from Northern California about an hour later. Ralph Whelan, Keith Henson, and Jay Skeer had already flown down from Northern California early that morning, and they (with Scott Herman, Steve Bridge, Joe Hovey, Dave Droit, and Paul Garfield) had located my checklists and were using these and our manuals to prepare the facility for a cryonic suspension. Many of the tasks on those lists had already been done or were nearing completion when Hugh and I walked in the door.

With the patient's arrival scheduled for 3:30pm (PST), and the remaining critical suspension personnel (including Dr. Nancy McEachern and Dr. Thomas Munson) arriving before then, we were able to complete most of the remaining preparations



Credit: Carla McFee

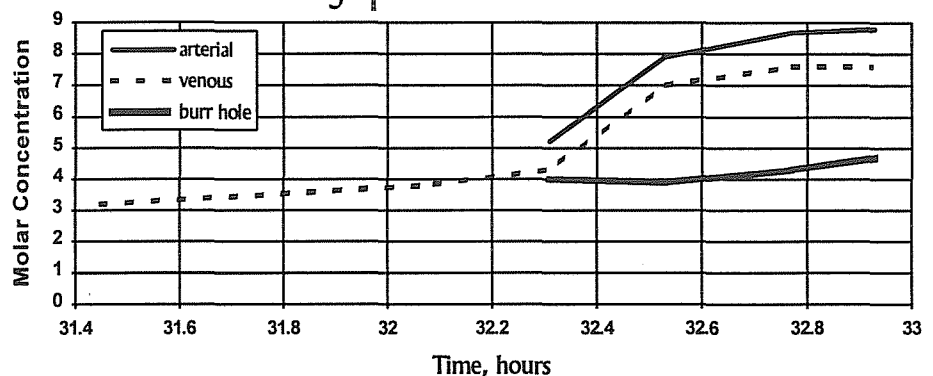
Hugh Hixon (left), Scott Herman (at computer), and Mike Perry (observed by Scott) enact the new automated cooldown system

for surgery before the patient was brought to the facility.

Flight delays ultimately resulted in the patient arriving at the Alcor facility at 5:00pm; her rectal temperature had dropped to 3.2°C during the airline transport.

Alcor perfuses its patients with cryoprotectants to reduce the damage incurred by the freezing process. The specific circumstances of this case led us to consider modifying our whole-body perfusion methods in order to optimize the cryoprotection this patient's brain would receive. Any 91-year-old patient would have a delicate vasculature, where any misstep during surgery could result in irreparable damage. Further, the pooling of the washout solution in her abdomen during transport preparations indicated at least one major leak in the abdominal vasculature. Without repair, we would experience serious leakage if we perfused her entire body, and quite possibly we would be unable to achieve simple capillary opening pressures, which in turn would significantly reduce the quality of the cryoprotectant distribu-

A-1206 Cryoprotectant Concentrations



tion throughout the entire body, and especially the brain. Based on these considerations, we decided that a neuro-perfusion circuit (which would prevent the abdominal leakage) would provide the best chance for adequate cryoprotection of the brain.

The surgery and cryoprotective perfusion promised to be difficult, given the ischemic damage and the patient's medical history, which included a previous heart-bypass operation. This case also promised to be educational, for similar reasons. At the suggestion of one of our consultants during this case, two burr holes were prepared in order to observe both hemispheres

of the brain for signs of edema (swelling). This showed us that the hemispheres may swell to different extents (right ~1.0mm, left ~3.0mm), and is a technique which will be used on future ischemic patients.

Dr. Thomas Munson was prepared to manage the surgical trays and instruments for the surgeon, Dr. McEachern, who would be assisted by Keith Henson. The surgery began at 6:01pm with the sternum being exposed using an electrocautery (following the preparation of the burr holes). Here, the previous bypass operation may have made the surgery a little easier: stainless steel sutures were clipped, and Keith was able to cut the sternum using a pair of paramedic shears.

Upon opening the pericardium, Dr. McEachern found a number of adhesions on both sides of the heart and a large amount of fat on the pericardial sac. The scar tissue proved to be a real hindrance, as it has in previous cases where patients have undergone bypass operations prior to cryonic suspension. When the surgery got particularly difficult, and Dr. McEachern was unwilling to attempt freeing the aorta from the surrounding scar tissue, Keith Henson proposed an innovative way to clamp off the descending aorta (it is standard in neuro cases to remove the lower extremities from the perfusion circuit). Keith proposed cannulating the aortic arch and using the cannula as an indicator for placing the clamp. With the clamp positioned, the cannula could be withdrawn, and the clamp secured. Keith's proposal was implemented, and successful.

The remaining connections for perfusion were completed shortly thereafter, and bypass was started at 8:44pm. At the start of the perfusion, the brain swelled to the extent mentioned above. As soon as the swelling was observed, the rate at which cryoprotectant was introduced to the patient was increased, in the hopes that higher osmotic pressures could reduce or eliminate the advancing edema. The swelling did not appear to get worse after this point, but we continued to watch the burr holes very closely to immediately catch any further expansion of edema (which would have resulted in the perfusion being ceased).

Perfusion was stopped at 10:17 after a slow and steady decline in perfusion pressure of unknown origin and increased perfusate loss through the patient. Samples taken then registered molar concentrations of cryoprotectant of 8.8M (arterial), 7.6M (venous), and 4.7M (burr hole). (The burr hole concentration figure is the best indication of the level of brain protection.)

The surgery and cryoprotective perfusion lasted over four hours, and in that time, Scott Herman and Monty Walter (a local volunteer) worked furiously to modify the neurosuspension cool-down system to provide for automated cooling of a whole-body patient. They completed a week's

worth of work in hours, finishing the project shortly after the conclusion of the perfusion. [See "Cooling Down" by Hugh Hixon, elsewhere in this issue. —Ed.] While they were finishing the last modifications, the patient was being prepared for the cooldown phase of the suspension. She was transferred into the silicone oil bath shortly after having been placed in protective bags.

The cooldown system worked nearly flawlessly from the start, despite its hasty implementation. Because the programming *hadn't* been tested prior to being required for a patient cooldown, Scott, Mike Perry, and Paul Garfield got little sleep over the next day or two, as they alternated shifts to monitor the cooldown system in case of any program failure.

Cooling proceeded uneventfully, as did the transfer of the patient into the long-term storage dewar. Different phases of the cooling transfers (from dry ice cooling to liquid nitrogen vapors to long-term storage) were photographed and videotaped by professional photographers Robert Bell, Carla McFee, and their assistant, Ana. We found that professionals are capable of preparing some of the most stunning cryonics photos Alcor has ever had.

One other interesting aspect of this suspension was that, at the request of Mrs. Stone's son, a Jewish orthodox service was later conducted for Mrs. Stone in Alcor's Patient Care area. Steve Bridge had given a talk on cryonics to a group of senior citizens at a local Jewish Community Center. He used his new contacts there to secure the services of a rabbi who seemed very interested in visiting Alcor.

As in every suspension, we learned some new things. Alcor's emergency response policies will now be modified with these improvements. To name just a few: the transport kit will always be shipped from Alcor, regardless of the circumstances of death (except for autopsy victims) if there has been any advance notice of the patient's decline; in the future, we will have compact medication kits available for Transport Team Members who are remote from the stabilization equipment or who live in areas where local travel is congested and slow; and better coordination of the Suspension Team Members would reduce the delays between the patient's arrival at the Alcor facility and the start of surgery (it should be nearly immediate).

Though there is an inevitable sadness and frustration experienced by everyone involved in high-ischemia cases such as this one, it's worth pointing out that the ultimate cryoprotectant concentration for Mrs. Stone is encouragingly high. This compares favorably with at least two other high-ischemia cases in Alcor's past: A-1058 and A-1108. Each of these suspensions occurred with no warning, and had emergency response and cryoprotective perfusion times of comparable lengths. (See *Cryonics* maga-

Thank You!

I'd like to thank once again everyone who participated in this suspension. Alcor continues to attract good-natured volunteers who are willing to tackle even the most daunting of tasks in order to improve the quality of a suspension. This was a complicated and draining suspension, and the calm, good sense, and humor of these people helped to make it bearable.

Participating in this suspension were:

In New York:

Gerry Arthus
Stan Gerber
Curtis Henderson
the patient's son
the mortician

In Scottsdale:

Steve Bridge
Fred Chamberlain
Linda Chamberlain
Dave Droit
Paul Garfield
Keith Henson
Scott Herman
Hugh Hixon (also in NY)
Joe Hovey
Tanya Jones (also in NY)
Bobbi Kraver
Ted Kraver
Dr. Nancy McEachern
Judy Muehlstein
Dr. Thomas Munson
Mike Perry
Dave Pizer
Trudy Pizer
Jay Skeer
Monty Walter
Ralph Whelan

zine of September, 1991 and June, 1988.)

Jerry Leaf, A-1058, suffered cardiac arrest local to our Riverside facility, and a transport team arrived at the hospital less than two hours after pronouncement (three hours after his arrest and subsequent, unsuccessful resuscitation efforts), at which time Jerry was packed in ice. This suspension was nearly compromised by autopsy, but some significant work by Alcor's attorney reduced the requirement for a full autopsy to a simple external examination and cardiac sample for toxicology studies. Cardiopulmonary support was initiated a full five hours after arrest, and Jerry was also found to have a ruptured gastric lining as

the result of ischemia. Ultimately, the cryoprotective perfusion in this case was not as good as that received by Mrs. Stone, in that the final venous concentration of glycerol was 2.4M, with a speculative concentration of the brain being 1.5M.

Bob, A-1108, also suffered an unexpected cardiac arrest, but was living in Florida at the time. In this case, no blood washout was done in Florida, and the patient was simply packed in ice and shipped to southern California for cryoprotective perfusion. Bob's perfusion was less than ideal, as in addition to the ischemic damage, the cause of death was arteriosclerotic cardiovascular disease. These conditions compromised

his perfusion, yet a final venous concentration of glycerol of 3.6M was achieved. (At that point in time, Alcor's goal for a cryoprotective perfusion was 4.0M final concentration.)

Alcor's response in Mrs. Stone's case compares favorably on many levels to these two in that all were whole-body patients with considerable ischemia and the achievement of local blood washout, and Mrs. Stone's final cryoprotectant concentrations were higher. We've learned from these (and indeed all) cryonic suspensions, and Alcor's capability has been improved for future patients.

Paperwork Counts!

Alcor is Forced to Surrender a Body for Burial

By Carlos Mondragón

In April the California Supreme Court refused to hear an appeal of lower court rulings which had mooted the anatomical donation of the body of "Sylvia Graham" to Alcor for cryonic suspension (see the report of the whole body suspension of A-1242, Oct. 1990 *Cryonics*). The effect was to let stand a court order directing that Mrs. Graham's next-of-kin arrange a "Christian burial."

This disposition of this case underscores the immense importance of executing for oneself the "onerous" paperwork which is required for Suspension Membership. Although we have from time to time reported on the progress of this case in *Cryonics*, here is a brief review.

Mrs. Graham had not executed *any* Alcor paperwork by the time she became critically ill and unable to do so. The suspension was arranged by her husband, Dr. "Marvin Graham." This was not the first or last of Alcor's "last minute cases" (those suspensions arranged by persons other than the patient). Under California law and the Uniform Anatomical Gift Act, a decedent's next-of-kin has the legal authority to arrange for disposition of remains, including anatomical donations, *in the absence of other written instructions by the decedent.*

The litigation which ensued did not dispute the legality of cryonics or the right of the patient to have chosen cryonics. Rather, the issue was the patient's intent. About two months after the suspension, the patient's sister produced a photocopy of an old will signed by Sylvia Graham which explicitly stated that she wanted a Christian burial, and did *not* want to be "frozen or

cremated"! The sister brought suit to force execution of that will. No original of the will was ever found, and it was Dr. Graham's contention that Sylvia had resolved her religious reservations regarding cryonic suspension and had, in fact, decided to sign up with Alcor several months prior to her death. The sign-up process had been delayed due to difficulties in arranging funding. Evidence supporting the fact that the other, primarily monetary provisions of the will had been rendered invalid by changes to her estate which Sylvia had made in the last two years of her life. Mike Darwin and I gave testimony (by deposition and at trial) that Sylvia had apparently already changed her mind on cryonics when she and Dr. Graham visited Alcor a few months prior to her suspension.

The trial court ruled that notwithstanding any evidence of Sylvia Graham's acceptance of cryonic suspension, she could not have given *informed consent* to the procedure. And since the judge accepted the legal status of cryonics as scientific research (that status having been established by an appellate court in Alcor's litigation with the California Department of Health) he went further: the standard of informed consent applied was equal to what would be required for medical experimentation on legally living patients.

Alcor never did intervene or participate in this litigation. We had fought in the courts long, hard, and *successfully* to defend and firmly establish the legal right to choose disposition of one's remains. Since this case presumed the right to choose, our role was to provide moral support and hope

for the best.

Ultimately, when Dr. Graham was forced to carry out the court order, our only choice was to demur. (An attorney assured us, meanwhile, that our move to another state did not change our legal status in this matter.) The court had ruled that Sylvia's will and lack of informed consent had sufficiently revoked her husband's authority to have made an anatomical donation of her body. But as next-of-kin he was still obligated and empowered to arrange a final disposition within the guidelines set by the will: no freezing and no cremation. Dr. Graham and Alcor complied with the letter of the law. At the end of May, Sylvia's body was transported back to California for burial, the first time such an incident has happened in the history of Alcor.

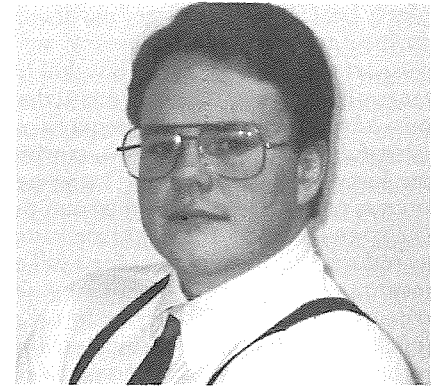
If there is any good news here, it is that you can expect the judiciary of the State of California to uphold your direction regarding disposition of your human remains after legal death. The caveat is that we had better be damned swift about making those directives. Even if full suspension membership has not been completed (for whatever reason), I believe that a signature on any two of the three core documents which comprise Alcor's core paperwork package would be sufficient to produce a different outcome in circumstances similar to those described above.

Membership Administrator Derek Ryan is at 1-602-922-9013, waiting for your call.



A GROWING PERSPECTIVE

By Derek Ryan



Everything changes.

Sounds simplistic and obvious doesn't it? About a year or so ago, (around the time I wrote my previous—and first—membership update for *Cryonics*) I used to think so, too. But then I worked at Alcor for another year. And now I can not only say it, but also understand it.

Everything changes.

For the benefit of those of you who are new to Alcor and the cryonics community, I offer the following brief review:

First, I came to Alcor in August, 1992, when our total membership stood at just over 300. Then, I signed up a lot of new suspension members (nearly 50 in five months,) got cocky, gloated a lot, and wrote a membership update in April, 1993 predicting *huge* membership increases for Alcor by mid-1994. Then, although I did sign up nearly 25 more by the end of 1993, Reality decided it was time to slap me silly. I didn't sign up many people for quite a few months, we actually lost a few members, (hitting a low of 331 members earlier this year,) and I discovered the true meaning of the word "humble." Most recently, I've started signing up people again (we're back up to 343 and steadily climbing), and I now claim to have a much more reasonable view of what to expect in the Real World Of Cryonics.

There. I've made it simple for those of you who are only skimming your way through this article to ferret out The Bottom Line. You are now free to glance at the accompanying illustrations, draw your own conclusions, and move on to another article.

But for those of you who want more, there is certainly more to say.

The last few years have been a veritable roller coaster ride for Alcor in many ways, and our membership growth rate has been

no exception. This has made writing these membership updates a more daunting task every year. (Actually, we've only published five of them as recurring features in *Cryonics*: the first by Thomas Donaldson and Hugh Hixon in 1989, the second and third by Ralph Whelan in 1991 and 1992, the fourth by yours truly in 1993. You're reading the fifth.) The point has generally been to analyze how things are going for Alcor in terms of membership growth, throw some history and raw numbers into the mix, and then make an attempt to extrapolate past and current trends into the future.

And of course, such an endeavor will always be an inexact science. Our annualized growth rate over the entirety of Alcor's existence (22 years) stands at just over 20%. (Which is astounding. Such a growth rate over that long a time period is almost unheard of in conventional business.) But

any of the past years is nearly futile. But just as stock market analysts look beyond past return rates, factoring their knowledge of specific trends and unusual circumstances into their predictions for future market performance, we can separate out some of the important things that influence our growth, and thereby formulate a much better guess as to what we should expect in the coming months and years.

Our New Competition

The first, most obvious thing which has affected our growth recently, and which will almost certainly influence our growth in the future, is the simple fact that some of our former members recently went off and formed their own cryonics organization. For quite a while, we had no idea how much this would affect our membership. Even though there was plenty of murmuring about it all through 1992 and 1993, it wasn't until the annual Alcor Board elections in September, 1993 that we first knew definitively that there would indeed be a new company. (As it turned out, there would eventually be a coalition of three separate companies: CryoCare, a membership organization; CryoSpan, a long term storage organization; and BioPreservation, a suspension services organization.)

Predictably, the estimates as to how many Alcor members might follow those first few in joining CryoCare varied according to whom you put the question to. Some thought there'd only be few (a dozen members or so), and some thought that there'd be a mass exodus (100 members or more.) As we probably should have expected, the real number nearly a year later (based on my most recent information) lies somewhere in between: 39 members.

Year	Total Members		Growth Rate
	(Beginning)	(End)	
1984	33	44	33%
1985	44	71	61%
1986	71	85	20%
1987	85	100	18%
1988	100	114	14%
1989	114	150	32%
1990	150	192	28%
1991	192	302	57%
1992	302	353	17%
1993	353	374	6%

our actual growth rates in each of those 22 years have often varied wildly from the overall average. (To see what I mean, just glance at the table below.)

As with attempting to analyze the stock market based purely on past indexes, guessing how many members we'll sign up next year based on how many we signed up in

As to whether we can expect to lose more members to CryoCare—and if so, how many—we can still only guess. The more the cryonics community grows, the more cryonics organizations there will be to choose from, the more often members will switch from one group to another. (There are now six with whom you can contract for cryonic suspension services: Alcor, The American Cryonics Society, CryoCare, The Cryonics Institute, The International Cryonics Foundation, and Trans Time, Inc.) Indeed, some of our most involved activists today came to us from other organizations. So we can expect to lose at least a few more to CryoCare eventually in any case. But naturally, we want to do everything we can to minimize that phenomenon, and even gain some members from CryoCare and the other organizations ourselves.

This makes for “interesting times” in the cryonics community. We are entering The New Era of Real Competition.

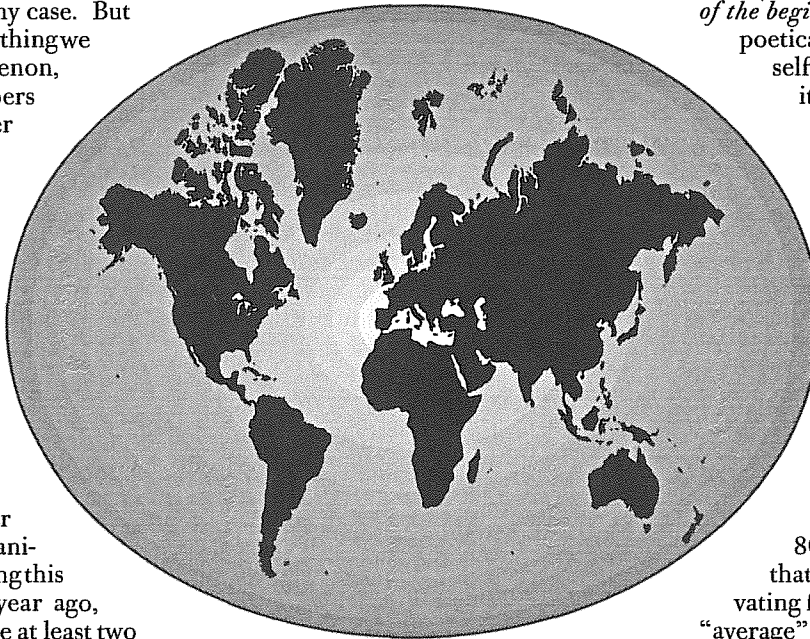
There are some who say that cryonics is still too small to support more than one or two organizations, that our lack of economies of scale should be more than enough incentive to remain banded together in one or two closely knit organizations. I remember vocalizing this sentiment myself nearly a year ago, before the split. But there are at least two important reasons that I no longer think this is *necessarily* so.

First, like many (most?) of you, I’m a *laissez-faire* capitalist. In my opinion, the open market is the most efficient method of deciding what is “best” and what methods of offering goods and services (and cryonics coverage) will give individuals what they desire most. Because there is no authoritarian power dictating the “ideal” number or makeup of cryonics organizations, any new companies which start up face the same Final Arbiter that the rest of us do already: market forces. That enough people saw it as in their interests to invest their time and money in another organization is all the proof required to show that there is *room*. And as it should be, only the realities of the market itself can determine just how long this will remain the case.

The second thing that changed my mind is the stark contrast between Alcor’s track record before the schism and after. For nearly two years, most of what got done by Alcor’s activists was bickering and politics. We were all Alcor members, and yet we often held completely contradictory views as to what Alcor’s institutional values and goals should be, never mind how best to

achieve those goals. Worse, the disagreements became more ubiquitous and all-encompassing as time wore on. Such a situation could only produce one thing: *entropy*. Lots and lots of entropy.

Since September, though, we have been able to devote our efforts to much more useful endeavors, like moving Alcor the hell out of Earthquake Central (not to mention Fire Central, Flood Central, Mudslide Central, Riot Central, and now, *O.J.* Central!) I don’t think I’m exaggerating when I say that we have done more to improve Alcor as a cryonics services provider in the



last 10 months than in the entire 24 months before the split. Apparently we can get a lot more done when we are free to work *for* something, rather than always *against*.

And this should hold true for the members who left as well, thereby netting us some less direct but still very important side benefits from the split. Because the principals of CryoCare now have control over their own organization, they too have a much better environment in which to see their own ideas realized. This means, we hope, that more productive work can be done for the science of cryonics itself, and for the cryonics community as a whole.

In fact, looking back over the last couple of years, and factoring in my knowledge of the individuals involved, I’m now convinced that a parting of ways was the *best* thing that could have happened. The *only* thing that could have happened. I’m just amazed that it didn’t happen a lot sooner.

Just look at the history of any of your favorite revolutionary groups, whether they be libertarians, Objectivists, space activists, or whomever. If the group is a) devoted to complex ideas which by their very nature *require* that you be willing to rebel

against societal norms, b) made up of *individualists*, and c) *growing*, then you will almost always end up with a situation like that which we saw in Alcor in ‘92 and ‘93.

The only thing that was really in question was who would go, and who would stay. I suspect that we are not done finding that out.

Our Increasing Competitiveness

In terms of how or whether we will grow then, the next obvious question is, “How prepared is Alcor to *compete*?” Is this new environment a harbinger of *the beginning of the end* of our growth, or merely *the end of the beginning*? Good question. (And poetically phrased, if I do say so myself.) If you ask me, I’d wager that it’s just the end of the beginning, and that we will continue improving and growing in both the near term and the long term.

Alcor is still *by far* the largest and best known cryonics organization. Though our numbers do not guarantee future growth, they do give us a considerable advantage. Any time new prospective cryonicists go looking for information about cryonics, they will most likely find our 800 number and call *us*. Beyond that, it is clear that the main motivating factor which usually leads your “average” intelligent lover of life to become more interested in cryonics and eventually sign up is personal contact with other cryonicists. As long as we are the largest organization, most of this sort of contact will involve *Alcor members*.

Of course, what our members say to these newcomers is a separate issue. We can’t just rest on our laurels and claim the blue ribbon simply by virtue of our size advantage. In an open market, we’ve got to keep earning that support from our members every day, so that they *want* to speak well of us when cultivating new members, and so that they want to remain Alcor members themselves.

Certainly, our move out of the depressed earthquake zone and into modern-day boomtown Scottsdale, Arizona qualifies as one of our most significant answers to the omnipresent “What have you done for me lately?” question. Besides the impressive new facility, and the developing ties with the local medical community, one of the major benefits of moving to the Phoenix area is that our thoracic surgeon lives here. She is an Alcor member, and very committed to a) seeing that our members get good suspensions, b) insuring that our suspension procedures and team skills continue to

improve, and c) insuring that we bring more medically oriented personnel on board in the near future.

Things continue to look better for us financially. The Richard Clair Jones Trust and One Million A.D. corporation (both of which were left to us by Alcor Patient Dick Jones as part of his estate) continue to receive residual income from Dick's various syndicated TV shows. On the negative side, we recently found out that we will in fact only be getting 50% of the income from One Million A.D. (which receives royalties from all reruns of *Mama's Family*). On the positive side, the resolution of this issue means that, at long last, the income which has built up has finally been *distributed* to us. This will allow us to continue operating at our current level of revenues and expenditures for at least another year, affording us more time to grow, and more time to address our operating budget deficit in creative ways (i.e., other than cutting staff and services).

Our Patient Care Fund has shown consistent growth by every meaningful measurement (i.e., at the *total assets* as well as the *per patient* levels) in every year of its existence, 1993 being no exception. Furthermore, we have done some important work over the past year to insure that this trend continues or accelerates in the future. First, we formed a new Patient Care Fund Investment Advisory Committee (PCFIAC). Their first order of business was to revise our old Patient Care Fund Investment Policy. The new policy is quite a bit more intelligently designed. Since then, we have also adopted a more sensible (and well defined and researched) Suspension Income Allocation Policy. [This was printed in The Alcor Phoenix, June, 1994. —Ed.]

One of the most significant changes implemented with this new policy was the elimination of the old "10% Rule"—that 10% of all Operating income be paid to the Patient Care Fund—and the introduction of a *new* 10% Rule, i.e., that 10% of all Operating income be directed to the Alcor Research Fund. The reasoning for this was pretty straightforward. First, the old 10% Rule served mostly as a "fudge factor" making up for the inaccuracies and ambiguities of the previous suspension income allocation system. This is not to demean those earlier efforts. Indeed, that so much worthwhile work had been done previously in this regard is one of the main reasons that we believe our most recent estimates to be much closer to the *actual* costs. ("Standing on the shoulders of giants. . ." as they say.) It's just that, as the years go by, we keep accumulating more data and more experience. (Did I hear someone murmur "Recession?") So we now feel confident in directing that 10% away from the stron-

gest area of Alcor's Operations—Patient Care—and redirecting it to one the areas with the greatest need for funding: Research.

And the revving up of our research program is one of the hottest news items I have to relate here. We recently appointed Alcor Director Mark Voelker, Ph.D., our new Director of Research. Though it is still a bit premature to give much detail, I can tell you that our first plan for a comprehensive research program is being finalized as this issue goes to press. By the end of this year, you can expect to hear much more positive news about this, including some preliminary results. In the meantime, we would still very much like to hear your ideas and thoughts about possible research angles and objectives. You can contact Dr. Voelker through Alcor.

I should also note that from my perspective (and that of most of Alcor's staff and board), the increased movement on the research front is an immense relief. Even though we have been doing research and making improvements in our techniques and equipment all along, we have been the recipients of some criticism in the past few years for not devoting more of our efforts to this critical area. It was often hard to reach real consensus as to how best to balance the many pressing immediate problems (such as getting out of earthquake danger) against the obvious continuing need to make improvements to our suspension protocol. Until we achieve completely reversible suspension technology (i.e., true "suspended animation") there is no way that any of us can feel completely comfortable with the current state of the art. And as the largest and most resourceful cryonics organization in the world, it was absolutely imperative that we shift our focus to comprehensively addressing the remaining obstacles to achieving this.

Finally, I should mention that there have been some recent personnel changes (improvements, we like to think) on our Staff and board. To wit: Dave Pizer has come on as a full time volunteer staff member at the facility, replacing Ralph Whelan as Vice President. Ralph remains the Secretary on the Alcor Board, and has become full time Publications Director, which is allowing him to devote more time to improving the look, scope, and regularity of our various publications. Michael Riskin, Ph.D., C.P.A., has replaced Dave Pizer as Alcor Treasurer, and Carlos Mondragon (former Alcor President) has replaced Dr. Riskin as the Board representative on the Patient Care Fund Investment Advisory Committee. To some, all of this might look like nothing more than a round of Musical Board Members. To us, it means quite a few more man hours devoted to the tasks at hand, and better utilization of our available skills.

When it comes to competitiveness, the bottom line will always be results. I think it is clear that Alcor currently holds an advantaged position in the cryonics community. How we use that advantage henceforth will probably be the single most important factor which influences our future prospects for growth.

The Ever Shifting Playing Field

So we can reasonably assume that increasing competition will drive up the overall quality of available cryonics service, and that Alcor in particular must keep the "use it or lose it" attitude if want to maintain our edge. The next question then, is, "Where will the *new* members come from?"

One way to answer that might be to take a look at our database and assess where our current applicants in the sign-up process came from. Though we don't have this information on everyone, we do try to keep track of what source motivates an individual to first contact us. (I.e., we ask them where they heard of us, how they found our phone number, etc., so that we get a better idea over time as to which types of publicity do us the most good.)

For those applicants about whom we have this piece of data, we know that leading source is (surprise!) Alcor members. (18 out of our 96 current applicants got in contact with us this way.) As I mentioned above, personal contact with cryonicists has long (always, as far as I know) been the most prominent identifiable factor which eventually influences people to sign up, and I think that we can expect that to remain so for a long time. No news here.

The second greatest source of current applicants—*Omni* magazine—seems a bit more interesting. For those of you who have kept your head buried in the sand, former Alcor member Charles Platt helped us quite a bit via his connections with *Omni*. He wrote a brief article which was published in their February '92 edition (which accounts for 3 current sign-ups), and he thought up and helped organize the *Omni*/Alcor Immortality contest. The contest itself was announced in the January, '93 edition (netting us 4 current sign-ups), and the contest winner was announced in the January, '94 edition (which brought us 3 more.) Also, we have two other current applicants who entered the Immortality Contest but who didn't actually contact us first. We contacted them after getting a complete listing of everyone who entered the contest. All total, *Omni* accounts for 12 of our current applicants.

As I mentioned in last year's membership update, our association with *Omni* represents a major shift in Alcor's marketing strategy, i.e., it is our *first* marketing in quite a few years, (since before the Dora

Kent crisis) and by far the most extensive and far-reaching marketing we've ever done. (*Omni's* circulation is around 3.5 million copies.)

One reason we haven't been so concerned about direct marketing since Dora Kent is that we've received so much *free* publicity in the meantime. From 1987 until 1992 we saw a fairly constant stream of stories about Alcor in newspapers (which account for 7 of our current sign-ups), magazines (5 current sign-ups), on television (5 more), and on the radio (2 more.) Almost all of this press came to us as a direct or indirect result of the various legal battles in which Alcor was engaged during that five year period.

But since 1992, the amount of free publicity we receive has continued to spiral

upward, despite that Alcor is no longer such natural fodder for shows like *Hard Copy* and *Inside Edition*. (I.e., because we're not in the Legal Hot Seat any more, stories about Alcor and cryonics no longer have that element of sensationalism. Thank you, Tonya, Nancy, and Lorena!)

When we moved to Scottsdale, we were simply *overwhelmed* with interview requests. In particular, one solitary article which appeared in *USA Today* on April 11th earlier this year generated nearly 25 requests for radio and TV (mostly radio) interviews in *one day!* We were stunned, to say the least. For the next month or so, we averaged more than one live interview per day, generating even more information requests from the general public over that time than even the original *USA Today* ar-

ticle did itself.

Talk about the snowball effect!

Even more interesting than the amount of publicity we've been getting, is the ever increasing *quality* of that publicity. More and more, we are portrayed as a cutting-edge scientific organization that "takes all of this technological and scientific advancement we've all been hearing so much about a bit further than the rest of us." In this vein, you might take a look at my review of the recent episode of *Picket Fences* elsewhere in this issue. (Nudge, nudge.)

It seems that many of the individuals who comprise our "society" are slowly starting to realize that The World Of Tomorrow may not be much like The World Of Today. The rampant pace of improvements in computer technology, not to mention the more

The Playing Field of the Future

Futurists, life-extensionists, libertarians, etc. (i.e., those who we generally think are most likely to become cryonicists) are *anything* but mainstream. Almost no one who subscribes to substantially mainstream values gets off the sofa to call Alcor for a sign-up package the first time they see a news story about us on the tube. Even among those who are more radical philosophically, it's clear that repeated exposure to cryonics and cryonics-related memes is usually necessary before they actually decide to sign up. This is the main reason that the "first contact source" data about our applicants is, at best, only a hint as to what nudged them in our direction, and at worst, a completely misleading piece of information.

So what *does* get them interested? Mutant genes? Nobel prize winning parents? No dog as a child? Good question(s). When *you* have definitive answers, call me, and you and I will become millionaires together as the first successful Cryonicist Prospectors. Fortunately, though, we don't need a completely definitive answer to improve our efforts at finding potential cryonicists.

Put simply, the best questions for assessing whether given individuals are likely to become cryonicists center on values and worldview. Do they expect the future to be better than the present and desire to participate in making it that way? Do they want to grow, get smarter, and continuously improve themselves? Do they think that advancing technology can and should help us overcome biological, genetic, and neurological limits to life, love, and happiness? If the answers to these questions are, "Yes! Yes!! Yes!!!" then they are among those most likely to be interested in cryonics.

And, not coincidentally, they are probably also *Extropians*.

In fact, all of the above questions were lifted (in paraphrased form) off of the latest informational brochure about Extropy Insti-

tute (ExI—pronounced *ex-eye*), which is based in Marina Del Rey, California. *Extropy*, meaning (roughly) the opposite of entropy, is the central concept of a burgeoning futurist philosophy known as *Extropianism*. In the brochure, you'll find the following definitions: "*Extropy*: A measure of intelligence, information, energy, life, experience, diversity, opportunity, and growth. *Extropianism* is the philosophy that seeks to increase extropy." *Extropy* is also the name of the stimulating magazine (whose full name is actually *Extropy: The Journal of Transhumanist Thought*) which you may have seen advertised in *Cryonics* (see the ad on page 6), and which is published by the Institute.

The Extropian Community is growing like wildfire. Among other things, there is a highly active electronic mailing list, where futurist ideas are debated with scientific rigor and a refreshing amount of optimism. The print run of *Extropy* has expanded from 50 copies for issue # 1, which came out in 1988, to 4000 (!) copies for issue # 13, which just came out. The Institute itself, much like Alcor, has been receiving a constantly increasing amount of media attention.

Extropians are generally smart, educated, motivated, independent, self-aware, self-actualizing, and frequently even good looking (though this isn't a requirement for membership). They are avid technophiles, and they love to think about solutions to problems that most people don't even know exist yet. (A phrase they like to repeat which might serve well as a credo: "We learn from the mistakes of future generations!") In other words, they are the most "natural" cryonicists in the world.

Although Alcor's database doesn't yet contain the kind of information that would make this easily discernible, a sizeable portion (something on the order of 20% and rapidly rising) of the new members who have joined Alcor over the past couple of years are admitted Extropians, and many of them found

their way to Alcor—and became interested in cryonics in the first place—via the Extropian Community.

In my opinion, it is here—among the Extropians—that we will find many and probably even *most* of the Alcor members of the next decade. (Go ahead, quote me! I'd love nothing more than to become as famous for *yeasaying* as some of those turn-of-the-century dunderheads who ("Nay!") said that man would never fly, or go to the Moon, or produce automobiles cheaply enough for the common man to afford them.)

And to say that we have an *in* with this group is to understate. There is a tremendous amount of membership overlap between ExI and Alcor already. Max More, ExI President, is a long time Alcor member, as are *all* of ExI's Directors. (Included on the ExI Board are Ralph Whelan, Alcor Director of Publications, and Tanya Jones, Alcor Suspension Services Manager.) Also, according to the latest figures I've heard, *some 25% of Extropy Institute's members (whose numbers have risen from 0 to more than 300 in just two years!) are Alcor members as well.*

All of this bodes extremely well for Alcor's future. Their membership growth will probably far outstrip Alcor's in the coming years, given that the cost of ExI membership is just a few dozen dollars per year, and that the focus of the Institute is much broader and more philosophically oriented. But though it's hard to predict whether the ratio of Alcor members who are also ExI members will change in the future, there is no doubt that we stand to benefit substantially from their growth.

I won't belabor this any more than I already have, mainly because I think Extropy Institute deserves a full article's worth of "belaboring" in a future issue of *Cryonics*. In the meantime, feel free to contact them directly if you would like more information.

And don't be surprised if you find out that *you* are an Extropian, too!

“radical” breakthroughs like the cloning of the human embryo, have done a lot to help in this regard. What’s more, even though the open ended possibilities of a radically different future still scare a lot of people, the number who find these possibilities *fascinating* (the exact word used by a local Phoenix news anchor in wrapping up a story about Alcor shortly after we got here) is beginning to grow *rapidly*.

The problem we run into is that finding these people, guessing who they might be before they actually contact us, is problematic. We have yet to identify a single characteristic (or set of characteristics) which identifies a person as a *sure bet* cryonicist. We can generalize, certainly. But just name any category into which you think most cryonicists fall (e.g., staunch individualists, college graduates, technophiles, atheists, optimists, pessimists, realists) and I will show you a bunch of cryonicists who are clear exceptions to the rule, as well as a *horde* of non-cryonicists who seem to fit the bill perfectly.

Even our “first contact source” information doesn’t tell us that much, really. As I implied above but did not state in so many words, with most of our current applicants, we simply have no “source” information. (The actual number one “source”—and this applies to 47 of our 96 current applicants—is “Unknown!”) And even when we do know which publication or person served as the actual cryonics meme-vector for a new member, this still tells us little or nothing about what got the person interested in and receptive to radical ideas like cryonics in the first place.

It seems that the best we can do for now is to single out those people and organizations who seem to hold sympathetic worldviews on whole, and try to target them. We do have a direct mail marketing project which promises to do just that, which we started prior to the move, but which necessarily fell by the wayside as we prepared to make the trek across the desert to our new home. (It has not yet been restarted, but we hope to get it moving again before the end of the year.) In the meantime, there are a few new organizations I know of which look quite promising. For more about one of them, see the box on page 17.

It’s That Time Again!

Okay, now we’ve almost gotten to that portion of the membership update where I subject myself to needless pain and humiliation, i.e., where I make some predictions about our growth. Before I do, though, I may as well go ahead and suffer the pain due to me after last year’s attempts.

In April, 1993, when we had 356 members, I made two specific predictions for our membership growth. First, I said we’d

have 425 total members by January 1, 1994. We had. . . 374. It was growth, but not by nearly as much as we’d hoped. Also, I said that I expected us to have 535 members by July 1, 1994. As of this writing (July 15, 1994), we have. . . 343.

Not even close!

What happened, you ask? Well, can you say, “Schism?”

Way back in April, ’93, things were very, very different. (Hence, the opening line of this article.) Sure, we weren’t growing much at the time (we only gained 7 members in the first six months of ’93,) but I still had reason at that time to believe that all of the growth-inhibiting politicking might soon cease, and that all of Alcor’s activists would consequently jump back on the bandwagon. Steve Bridge, who had fairly strong ties with activists on both sides of the fence, had just come on board as Alcor’s new CEO, and many of us were trying very hard to see that we got past our differences and got back to the work of making Alcor stronger.

As you already know, this just didn’t happen. Instead, things got worse right up until the split in September, ’93, and this couldn’t help but affect our growth.

Immediately after that fateful September board meeting, things got better in a hurry. Those of us who were staying to work for Alcor (i.e., most of the board, all of the staff, and a number of key activists) were finally, mercifully, freed from the infighting, and our growth rate reflected this. We gained *three times* as many members in the months of October, November and December of ’93 as we did in the previous 9 months.

But then our growth tapered off again for two big reasons. First, we moved. (Anyone out there ever done that? Can you say, “Backlog?” I knew you could.) Then, we finally received the official membership resignations from those who were switching to CryoCare. Fortunately, we can reasonably expect that both of these things were one-time deals.

Since then, the membership total has started to inch upward again, and I feel confident that we will return to our “normal” (whatever that means) growth rate in the coming months. Besides having finally worked my way out of *most* of the backlog that had accumulated in Membership Administration during and after the move, there are a couple of other factors which give me reason to feel more positive. For one thing, we received nearly 30 new applications for membership during January, ’94 (!) due partly to the resolution of the *Omni* contest and partly to the increase of the neurosuspension minimum funding amount which we implemented on February 1 of this year. Because this happened right before we moved, (multiplying the

backlog phenomenon even more than we expected,) we have just recently been able to turn our efforts back to helping these people complete their arrangements.

Also, one of the main reasons Dave Pizer has come on as a full time staff member is to help me help our applicants through the sign-up process. (Something which usually only gets done when the other current-member-related tasks in Membership Administration are caught up, which means, *almost never* when I have to do it all by myself.) Due to the complex and not very well understood scientific phenomenon known as cryocrastination, we have come to understand that *ongoing encouragement* to get signed up is critical when it comes to seeing that applicants complete their arrangements in a timely manner. Dave’s help should thus be tremendously valuable.

Having said all of that, (your laughter here,) I will now relent, make my predictions, and dismiss the class for recess.

Give me that drum roll again please. . .

380 members by the end of 1994. (Giving us at least some growth for the year, despite it having been “The Year Of The Schism.” This will continue Alcor’s amazing trend of growth in every year of its existence, giving us all a timely morale boost.)

And. . . 425 members by July 1, 1994, around the time that the next Membership Update is published. Mark it on your calendars and prepare to experience some more of this kind of fun again next year. (And if it’s Derek-bashing you’re into, feel free to look forward to it for that reason, too. Just promise not to be too disappointed if I deny you the opportunity by exceeding these goals.)

In any case, remember that cryonics is a *long term* proposition, something I’m coming to appreciate more each day. These annual attempts at prognostication aside, it is our prospects over the long term that really matter. I know that Alcor will continue to grow, and I’ll love nothing more than to tell you all about it over and over again in these very pages, until those of you who get tired of listening to me finally exact your long anticipated revenge on me at the Far Edge Party. (Just be careful. One of me is probably just annoying. But a few million copies of me would be kind of an unstoppable force.)

See you there.



Cryonics and Life Extension

A Three-Day Conference presented by The Life Extension Foundation

November 4th, 5th, and 6th, 1994 at the Marriott Hotel, Ontario Airport, California

This is a time of unprecedented choice and competition in cryonics. How can you evaluate your options, learn about the latest technical advances, and get authoritative answers to all your questions? **The Cryonics and Life Extension Conference** offers a unique opportunity, open to everyone who has a serious interest in cryonics.

Topics will include:

Latest Advances in Human Cryopreservation. State-of-the-art techniques for stabilizing cryonics patients, minimizing injury, and maximizing chances for resuscitation.

Dewars vs. the Cold Room. Is liquid nitrogen the best method for long-term care? If not, how cold should our patients be? How reliable are other methods of refrigeration? What are the economies of scale?

Investment Strategies for Patient Care Funds. How should we balance risk and revenue?

New Models for Cryonics Organizations. Is a "full-service" organization still the best model for stability, growth, and research? What are the advantages of the new system of independent, competing service providers?

Frontiers of Cryonics Research. What's being done, what needs to be done, and what are the implications for cryonicists today?

Estimating our Chances. How much should we depend on nanotechnology to save us? How can we calculate the rational odds in favor of reanimation?

Rejuvenation Now. Does aging research offer real hope in our current lifetimes? What are the best current therapies, and what can we expect to see in the next ten years?

The Legal Rights of Cryonics Patients. Will we ever be allowed to choose cryonics before legal "death"? Who should have legal custody of cryonics patients? Will the patients themselves ever have human rights?

Improving the Image of Cryonics. How can we present cryonics more effectively to the general public and the scientific establishment?

Events

On Friday evening, November 4, there will be an informal mixer. Panel discussions and presentations will take place all day on Saturday, November 5, followed by a banquet. A half-day of panels will follow on Sunday, November 6. On Sunday afternoon, there will be a guided tour of the operating room and laboratory shared by BioPreservation, CryoSpan, and 21st Century Medicine. Sponsors of the conference include The Alcor Foundation, the American Cryonics Society, BioPreservation, CryoCare, CryoSpan, and the Venturist Society. Representatives from these groups will be on hand to answer questions and give out literature.

Participants

The following leading personalities have stated that they intend to participate:

Steve Bridge
(President, Alcor Foundation)

Fred Chamberlain
(Director, Alcor Foundation)

Linda Chamberlain
(Co-founder, Alcor Foundation)

Mike Darwin
(President, BioPreservation, Inc.)

Thomas Donaldson, Ph.D.
(Author, *A Guide to Antiaging Drugs*)

William Faloon
(Executive Director, The Life Extension Foundation)

Steven B. Harris, M.D.
(Leading anti-aging researcher)

Hugh Hixon, M.S.
(Director, Alcor Foundation)

Saul Kent
(President, The Life Extension Foundation)

Bob Krueger, Ph.D.
(Management consultant, CryoCare)

Ralph Merkle, Ph.D.
(World expert in nanotechnology)

Carlos Mondragon
(Director, Alcor Foundation)

Brenda Peters
(President, CryoCare)

Charles Platt
(Vice-President, CryoCare)

Michael Riskin, Ph.D., CPA
(Director, Alcor Foundation)

Courtney Smith
(Financial adviser, CryoCare)

Mark Voelker, Ph.D.
(Director, Alcor Foundation)

Paul Wakfer, Ph.D.
(President, CryoSpan)

Brian Wowk, M.S.
(Director, CryoCare)

Jim Yount
(President, American Cryonics Society)

H. Jackson Zinn, J.D.
(President, International Cryonics Foundation)

Registration

Advance registration is \$50, which includes the Saturday evening banquet. There will be a \$25 surcharge if you register at the door.

To pay by credit card, **call (800) 841-5433**. To pay by check, send \$50 to The Life Extension Foundation, P.O. Box 33022, Hollywood, FL 33022.

The Marriott Hotel at Ontario Airport is offering a special rate of \$64 per room (single or double). To be eligible, **call the hotel at (800) 284 8811 before October 15, 1994**.

If you want to know more about cryonics and life extension, this conference is of vital interest. Space will be limited, so please book early.

We hope to see you there!



CRYONICS and *Multiple Personality Orders*

by Ralph Merkle, Ph.D.

There has been some recent discussion about the relationship between nanotechnology and cryonics. It would seem more appropriate to discuss the relationship between future medical technology and cryonics.

To illustrate this point, consider "Cryonics, Cryptanalysis, and Maximum Likelihood Estimation" (which will appear

methods to the recovery of information about neuronal connectivity from frozen brain tissue (see sidebar); a particular method used to determine the wiring in World War II rotor machines can be adapted to determine the neuronal wiring when partial or incomplete information is available (i.e., as a result of damage caused by a poor suspension in which there was significant ischemic time, poor perfusion of cryoprotectant, etc).

The application of cryptanalytic methods to cryonics is largely unrelated to nanotechnology, yet it is relevant if we are to estimate the ability of future medical technology to revive a frozen patient. Likewise, other technologies will no doubt be relevant to future medical capabilities and yet not be closely related to nanotechnology.

Before considering the kinds of damage that future medical technology might reasonably be able to reverse, it is worth pointing out that the critical issues facing cryonics today are not primarily technical in nature but are instead more fundamentally bound up with human attitudes, emotions, and beliefs.

Not too long ago some Southern California coroners deliberately subjected an Alcor suspension patient to roughly 24 hours of warm ischemia (he'd been shot in the head).

"Anyone with any experience in cryonics is well aware that most people's response to cryonics has little to do with rationality and logic. A common attitude was expressed by Southard (a cryobiologist) in a debate on national television: people are supposed to die and saving lives of people who are 'too old' is a bad idea."

in the proceedings of *Extro 1*, the recent Extropy Institute conference). This paper considers the application of cryptanalytic

Cryptanalysis and Cryonics

Cryptanalysis is the art and science of deciphering secret messages sent by others. The cryptanalyst often has little more to work with than strings of seemingly random characters (variably supplemented with stolen designs). From IWPUY FEWPC QLHID XOIRE the cryptanalyst must deduce "Attack at dawn!" despite the confusing and obscuring transformations to which the original message has been subjected.

Cryonics would seem to pose utterly different problems, yet the two are closely related at a deep and fundamental level. In cryptanalysis, we seek to deduce the plaintext despite the obscuring transformations introduced by encryption. In cryonics, we seek to deduce the healthy state of a person, despite the obscuring transformations introduced by the process of suspension. If the suspension went well and little damage was done, this deduction should be easy. If the suspension went badly and significant damage was done, more sophisticated methods might be needed to deduce exactly which synapse joined which neuron, or what path an axon took.

Intriguingly, some of the mathematical methods used to cryptanalyze World War II rotor machines map quite directly onto the problem of determining neuronal wiring given partial information about that wiring. In the rotor machine, the exact connections within the rotor were often unknown and had to be deduced. In a bad cryonic suspension, the exact connections between neurons might be unknown and have to be deduced. The similarity in the problems is more than a simple word play: techniques developed for cryptanalysis should often be applicable to cryonics.

In both cryptography and cryonics there must be redundancy if we are to succeed. In cryonics, this redundancy is present both at a low level (in the many molecular parts that make up a single nerve or synapse) and at a higher level (in the redundant storage of information in different regions of the brain). If the structure doesn't "look right" locally (given a full knowledge of what healthy neurons should look like) then the local structure can be corrected until it does. If the structure doesn't "function right" globally (a dot appears in the wrong place in your field of view, or a sine wave sounds a bit flat when it shouldn't) then the global structure can be corrected until it does. Powerful cryptanalytic methods can use both local and global information to deduce the original neuronal structure, even when it is obscured by the physical transformations that might occur during a bad suspension. Only when damage is so extensive that there is more than one possible structure that both "looks right" locally and "functions right" globally will we begin to lose, a bit at a time, the unique characteristics that distinguish one human being from another.

In the various legal actions that have been pursued in California courts, I do not recall anyone arguing that cryonics was either infeasible or improbable, nor do I have any reason to believe that the coroners in question would have claimed that cryonics was infeasible had they been asked about the subject. The action taken was directly contrary to the wishes of the patient, and did not further the coroners supposedly legitimate duty to conduct an informative autopsy. Indeed, rapid cooling would likely have been helpful in preserving additional detail. The individuals responsible have not been punished, nor is there even any consideration that such a course of action might be appropriate.

In short, not only is it possible that they killed him, they wouldn't even argue that they hadn't. They'd say they were just doing their job. And they'd do it again. Clearly, the current social and legal context is not optimal for those interested in long term survival.

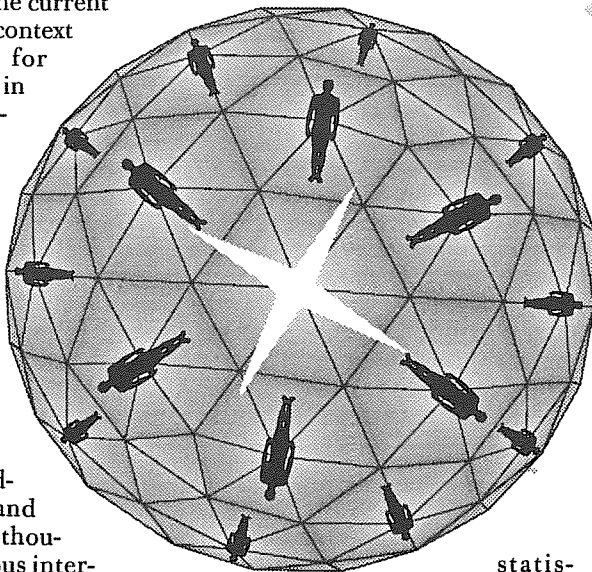
Or consider that there are

over 5 billion people on the planet (most of whom profess that saving lives is good and ending lives is bad) and that only a few thousand take a serious interest in cryonics: a method of quite literally saving the lives of billions of people. Perhaps some percentage of these people are perfectly rational individuals who would adopt cryonics if they thought it would work and are merely unpersuaded that it is feasible. Anyone with any experience in cryonics, however, is well aware that most people's response to cryonics has little to do with rationality and logic. A common attitude was expressed by Southard (a cryobiologist) in a debate on national television: people are supposed to die and saving lives of people who are "too old" is a bad idea. It is also common for people to argue against cryonics on the grounds that it might result in overpopulation: this casual suggestion that mass murder is a suitable method of dealing with concerns about population is completely at variance with normal ethical standards.

The fundamental issue in cryonics today, therefore, is to understand and change this rather odd attitude; to arouse at least

some small percentage of the population from their hypnotic indifference to their imminent demise and focus their activities on some simple strategies for staying alive. Cryonics is not the only such strategy: many researchers pursuing the goal of extending human life span have noted that support for such activities is curiously small, and that overt hostility is not an uncommon response.

There are, of course, many ways to gain greater acceptance for cryonics. Legal action has been used and has resulted in a beneficial improvement in the behavior of some officials, notably officials of the California Department of Health Services, who view the increased record keeping burden (someone who was frozen and then revived would cause confusion in mortality



statistics) as a sufficient reason to kill people.

The court records with their arguments are matters of public record and are both extremely amusing and utterly horrifying: "There is also an overwhelming public purpose for ensuring that only recognized types of disposition are being carried out, especially in light of the facts of this case. Cryonic suspension, as practiced by Alcor, presents serious questions regarding public health and mortality statistics. Should cryonically suspended people be considered 'dead' or should a separate category of 'suspended' people be created? How should such people be registered in official records?" "...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?"

Fortunately, the courts were not im-

"It is also common for people to argue against cryonics on the grounds that it might result in overpopulation: this casual suggestion that mass murder is a suitable method of dealing with population concerns is completely at variance with normal ethical standards."

pressed. "These are, of course, but a few of the presently imaginable conundrums which could arise should Alcor at some future time actually succeed in reviving the currently dead. Nonetheless, we are confident that those persons who will then head our various branches of government will be far wiser than we and entirely capable of resolving such dilemmatic issues without our assistance."

Stories that present cryonics as reasonable and life-saving are also useful. The recent episode of *Picket Fences* [see "On the Fence" by Derek Ryan, elsewhere in this issue.—Ed.], though intended primarily to entertain and amuse, still presented cryonics to a broad audience in a fashion that is likely to elicit sympathy and interest in many.

Direct one-on-one contact with friends, relatives, coworkers, and others has proven effective. Television, newspapers, and other news media simply can't substitute for a conversation with someone you know. Simple questions and simple answers ("Ohhh! You pay for it with life insurance!") can clear up concerns that would otherwise go unaddressed.

Some are influenced by impressive facilities and reasonable finances. There is a certain feeling of confidence that comes from an impressive building that has the right "look." And there must be adequate money to pay for the liquid nitrogen, and financial safeguards to insure that the money stays safe.

Some are influenced by organizational stability and cohesiveness. An organization with a well known and well understood set of objectives—with officers and staff who understand and share those objectives and will continue despite adversity—is an asset that can favorably influence many.

Some are of the opinion that logic and

rationality, feeble forces though they may be in the human psyche, should be pursued as well. There is evidence that at least some people can be persuaded by this approach. Articles in scientific and technical journals, presentations at conferences, discussions of the technical issues: these are all part of the modern scientific approach.

Asked to choose which course of action to pursue, different people pursue different approaches. Some might support the Hemlock Society in their quest to legalize "death with dignity." Some might take direct legal action, or pursue a career in law to make sure appropriate and effective legal actions are taken in a timely fashion. Some might make money and use it to support cryonics directly. Some might pursue a successful career as a writer, adding cryonics to the plot whenever they can slip it in. (How much help have we received from the writers of *Picket Fences* and other

on only a few here—there are many others). Not everyone either can or should attempt to do all of them. As more people enter cryonics, each individual will decide where and how much they can help. Some will be content to pay their dues and hope for the best. Others will want to take a more active role and try to improve some part for the betterment of all. There are many ways of contributing, and I expect that all of these contributions will help.

Each person will add to the whole, and almost none will leave it smaller by their efforts.

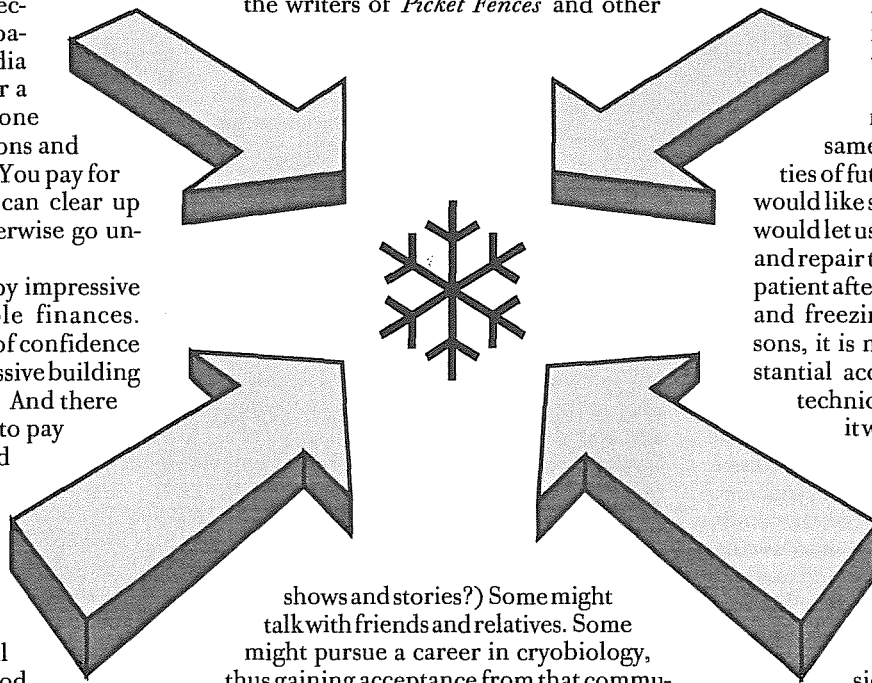
Which brings us to that small minority of us that put our faith in logic and rationality. Here, the question is simple: will cryonics work? To persuade those who act on evidence and logic the path is clear. There are

two main issues: how much damage is done during suspension, and what kinds of damage will future medical technology be able to reverse?

Clearly, we would like to minimize damage while at the same time maximizing the abilities of future medical technology. We would like suspension technologies that would let us simply warm the patient up, and repair technologies that can revive a patient after substantial delay, ischemia, and freezing injury. For various reasons, it is my opinion that to gain substantial acceptance of cryonics in the technical and medical communities

it will be necessary both to show that suspension damage can and is being minimized, and also to show that future medical technologies will be able to reverse substantially greater injuries than typically occur in a suspension.

While many people have thought about both parts of this problem, most have emphasized one aspect or the other. This emphasis allows a more detailed and accurate analysis than would be possible if an attempt were made



shows and stories?) Some might talk with friends and relatives. Some might pursue a career in cryobiology, thus gaining acceptance from that community, providing evidence that cryonics will work and improving suspension methods.

All these and more need to be pursued simultaneously. There are many things that need to be accomplished to make cryonics a success (and I hasten to add I have touched

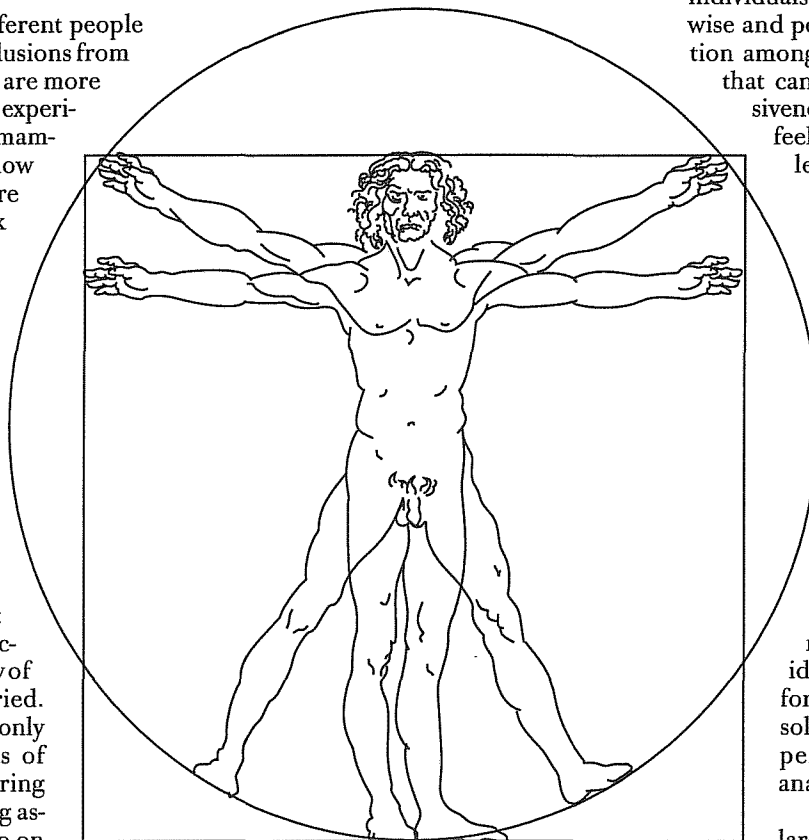
by a single individual to simultaneously pursue both. Different individuals also vary in their backgrounds, career choices, and interests and so it is natural for people to emphasize that aspect of the problem which fits most easily with other aspects of their life. Such diversity is healthy and should be encouraged.

It is also the case that different people are more influenced by conclusions from one area or the other. Some are more impressed with (for example) experimental work which recovers mammals after several hours at low temperature, while others are more impressed by work showing that future medical technologies should be able to reverse even severe injuries. Various efforts to determine which is "really" more important miss the fundamental point that different people in the world today can be more effectively persuaded by different approaches: pursuit of both areas is important.

Opinions about what course of action will most effectively increase the probability of success of cryonics are varied. These differences depend not only on differing interpretations of available evidence and differing levels of expertise in differing aspects of the problem, but also on differing objectives. The objectives of (1) the terminally ill patient facing certain death within a few months differ from (2) the objectives of the older person who expects to survive perhaps another decade, which differ from (3) the objectives of the younger person who might or might not need cryonic suspension at all, which differ from (4) the objectives of the healthy person with a loved one in suspension. This is only a small sampling of the varying motives that people can bring to this issue. Given the broad range of circumstances and the widely differing backgrounds and types of knowledge, it is un-

surprising that diverse courses of action have been proposed.

As we discuss and evaluate the alternative courses of action that are available, it is worthwhile to remember that people who disagree with us do not necessarily do so because of either intellectual inferiority or



hideous personality defects. As an example, some think that current suspension technologies have a relatively high probability of success. Some think the probability of success is moderate or low. There is room for disagreement, and discussion of this issue would seem likely to improve our collective knowledge of this subject. To be useful, however, such discussions must make apparent to a broader audience facts, lines of logic, and concepts that were previously apparent to only a few. While determining the reason or reasons which cause another's opinion to differ from our own

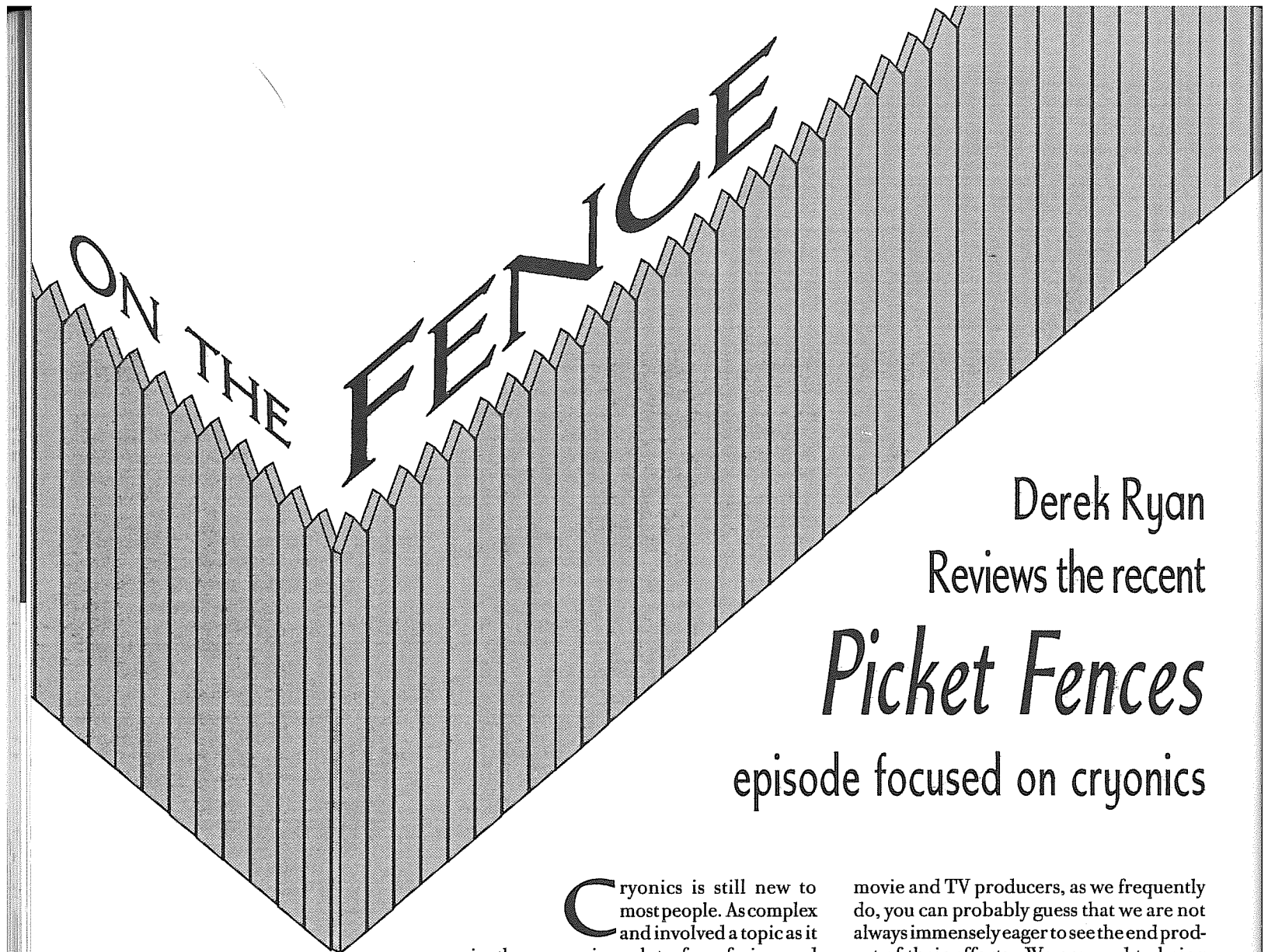
can be difficult (much like debugging a program, in some respects), the results can often be illuminating. Differing implicit assumptions, different backgrounds, errors, etc. can all play a role.

The creation of unpleasant sounding labels and their application to those foolish individuals who fail to agree with our own wise and perceptive views is an old tradition among humans, but it is a tradition that can breed factionalism and divisiveness. Calling people names might feel good, but it both divides us and leaves us no wiser than before. A better approach is to deal with the individual differences one at a time, gradually making explicit the implicit assumptions, and gradually bringing clarity to the subject. There will likely remain some disagreements, but it is my experience that they will not be over trivial issues that are easily resolved, but rather over difficult issues where the preponderance of evidence is not yet entirely clear and where people of good will can reasonably disagree. Explicitly identifying such areas is useful, for others can then focus on resolving the issues (either by experimentation or theoretical analysis or both).

We are few and the world is large. Success is likely but not assured, and depends on cooperation. We should encourage forms of discussion that are likely to clarify and enlighten, and discourage attempts to label one or another group in ways that encourage division and factionalism but bring no gain in our understanding of the issues, of the world, and of ourselves.



"To gain substantial acceptance of cryonics in the technical and medical communities it will be necessary both to show that suspension damage can and is being minimized, and also to show that future medical technologies will be able to reverse substantially greater injuries than typically occur in a suspension."



ON THE

FENCE

Derek Ryan

Reviews the recent

Picket Fences

episode focused on cryonics

On May 6th of this year, CBS aired an episode of its first-season melodrama *Picket Fences* devoted entirely to the issue of pre-mortem cryonic suspension, in this case for a boy suffering from leukemia. To date, the episode is the most in-depth and favorable treatment of cryonics ever to air on network TV.

Cryonics is still new to most people. As complex and involved a topic as it is, there remains a lot of confusion and misinformation which gets repeated and regurgitated with every new discussion.

With fictional treatments of cryonics, this tendency to obfuscate the facts is particularly prevalent. Naturally, writers trying to sell their stories have a strong motivation to entertain and somehow “hook” their audience. And unfortunately, when it comes to modern day science, it seems that truth is sometimes quite a bit less entertaining than fabrication. This explains a lot about many of the stories we have seen over the past few years which involved cryonics and/or suspended animation. (E.g., the movies *Late for Dinner*, *Forever Young*, and most recently, *Demolition Man*.)

Although these truly *fictional* presentations may heighten the overall awareness that suspended animation might be possible and/or have beneficial effects, the most immediately tangible effect is arguably more confusion for us to address when people come to us in search of cryonics information. So when we get those information requests from fictional writers and

movie and TV producers, as we frequently do, you can probably guess that we are not always immensely eager to see the end product of their efforts. We are used to being disappointed.

On rare occasions, though, and for reasons that we usually aren't able to discern even afterwards, we are not so disappointed. The episode of *L.A. Law* a few years back—in which a lady with a brain tumor was frozen pre-mortem—is one of the better examples of this. That show took a pro-cryonics, pro-individual freedom and responsibility viewpoint, and molded it into a fairly heroic story. And recently, we were “not so disappointed” to a new extreme by an episode of the CBS dramatic series *Picket Fences* which aired on May 6th.

Okay. We were *utterly flabbergasted* at how good the show was. In fact, just to give you a little anecdotal evidence of this, witness my attempts to write a review of the show. At first, I just thought I'd write a short piece for *The Alcor Phoenix*. But as I went back and viewed the show again to refresh my memory, I realized that I'd need more space. (I.e., I liked the show even better after my second viewing, and decided it *deserved* more space.) Eventually,

I decided that it was good enough to merit a full review in the pages of *Cryonics*. And now that I'm actually writing it (and now that I've seen the show quite a few times), I see that this review is rapidly becoming a full blown feature article. (Too bad I'm not getting paid by the word! Oh well.)

The show was simply *that good*. And in fact, I would go so far as to say that it is the best fictional treatment of cryonics I have ever seen on TV or in a movie.

So enough with the background information already! I'll actually move on to telling you about the show now. (Your applause here.)

Apparently, the *Picket Fences* writers did something that almost no one ever does in writing about cryonics for a network show, i.e., they *studied* Alcor's literature and *paid attention* to what we have to say. In fact, many of the lines uttered during the course of the show are nearly word for word from the "Frequently Asked Questions and Answers" chapter of Alcor's handbook, *Cryonics: Reaching For Tomorrow*. To give you a better feel for how well they represented the various viewpoints about cryonics, I think it's worthwhile to quote three different conversations from the show.

First, though, the premise: A mother and father (the "Huttons") have just been informed by "Jill" (a main character on the show—played by Kathy Baker—known locally as an excellent and highly ethical doctor) that their nine year old son ("Bobby") has leukemia, and that he is expected to live six months at the longest. Naturally, they are grief stricken, and it is in this context that they begin to consider having Bobby frozen.

Jill is taken aback when the Huttons return to her office, shortly after receiving the prognosis, accompanied by their lawyer and "Carter," (a lesser—though recurring—character who happens to be both the local Medical Examiner (!) and a well respected doctor), asking her to join them in petitioning the court for the right to have the boy frozen pre-mortem.

Brief digression: If there is any one thing we might wish were different about the story, it would probably be the example chosen—a leukemia victim—as an arguing point for the rationality of pre-mortem suspension. Because leukemia does not necessarily destroy a child's mind prior to death, we would probably not recommend seeking the right to pre-mortem suspension in such a case. A brain tumor such as Thomas Donaldson's would have been a much better example for arguing in favor of pre-mortem suspension, but, of course, that was already done by *L.A. Law* (which, incidentally, had the same

Executive Producer as *Picket Fences*: David E. Kelly, who propelled both relevant episodes). Maybe it's still premature at this point to expect perfect clarity in cryonics-related plot lines. (Alas.) Since they did choose this example, though, it is worth pointing out that the audience is probably more likely to sympathize with the desire to prolong life via extraordinary measures when the subject is one who is dying so young (i.e., before "his time.")

Fortunately, the muddiness of the case doesn't really interfere with the story. (It was probably only those most in the know—i.e., *cryonicists*—who had any clue as to this bit of confusion anyway.) The larger issues about cryonics itself (religious, social, political, legal, technological, etc.) are still discussed with an almost alarming deftness. And it is these issues which get all of the attention.

Take, for example, one of the early conversations in the show. Jill tells the parents that she won't help with their cause, and is visibly shaken by the whole idea of having the boy frozen. Then, in the very next scene, we see her burst in and confront Carter in the hospital morgue about it, and here is the conversation that follows:

Jill: "What's wrong with you?"

Carter: "Excuse me?"

Jill: "Pumping up grieving parents with cryonics?"

Carter: "They came to me!"

Jill: "You're a doctor! You're subject to the Hippocratic Oath, the first rule being, 'Do no harm,' and you counseled suicide!"

Carter: "*They asked me* about cryonics. I explained it. I did not recommend it. I did *not* counsel suicide. And your prejudices against science aside, don't you ever charge into my office again attacking me as a doctor!"

Jill: "As a doctor you have a moral duty!"

Carter: "The Hippocratic Oath is about survival, clinging to life. That principle is completely served by cryonics!"

Jill: "It's *perverse!* It's against nature!"

Carter: "You want *nature*, Jill?" [Pulling cadaver out into view] "Here! *That's Death! That's Perverse!*"

Jill: "Cryonics is medical experimentation!"

Carter: "The kid is dying."

Jill: "Because he's *meant* to die, Carter. We're not going to change that."

Carter: "Maybe we can."

Jill: "I'm not going to sit back while you and your ghouls turn a nine year old kid into an experiment for the science fair, just so you can sit around the pool bragging at your coroner's convention!"

Carter: "You self-righteous, arrogant, nar-

Cryonics in the Movies and on TV

Leaving aside the use of cryonics in books (non-fiction and fiction alike, because we'd never have room to print them all in a box this size!) and news/documentaries, we know of at least the following appearances of cryonics in cinema and television fiction. (If you know of others, please let us know!)

Movies

Sleeper

Demolition Man

Late For Dinner

Forever Young

The Man With Nine Lives

Television

L.A. Law

Mad About You

Picket Fences

The X-Files

row-minded, bitch!"

Jill: "Uh!"

Carter: "That's right. I said it. If you come up with a way to save Bobby Hutton, I'll back off. Until then, how *dare* you or anyone else tell me not to try!"

From that point on, the show is a non-stop whirlwind of point/counterpoint about life, death, science, technology, religion, and morals. In fact, one of the most impressive aspects is the sheer *volume* of information they manage to include in one hour of TV, all within the context of reasonable conversations among more or less reasonable people.

And in this vein, I should also mention one of the things I liked most about the show: that the writers conveyed most of the anti-cryonics ideology via Jill, who is a main character, and a *doctor* to boot. At first this might seem counterintuitive. After all, *acceptance* of cryonics by mainstream doctors is one of the things we desire the most. But, strangely, having a doctor voice most of the deathist views seems to do more,

albeit indirectly, to highlight the extreme irrationality of deathism than a direct frontal assault ever could.

Take the following conversation, for example. At first, it is Jill talking to her son, ("Zach," played by Adam Wylie), who goes to school with Bobby Hutton, and who has been wondering about both the idea of cryonics and death itself since finding out that Bobby wants to be frozen. Jill's husband ("Jimmy," the local sheriff, played by Tom Skerritt) is nearby, and after hearing what she says to Zach, he can't help but probe deeper to find out what she really thinks:

Zach: "Why won't you help him?"

Jill: "I want to help him honey, but I just don't think that *freezing* him is help."

Zach: "But if they invent a cure he could live longer."

Jill: "It's not God's plan for us to live like that. To be stuck in liquid nitrogen, and then defrosted umpteen years later. *That's* not God's plan." [Pause] "I know this is complicated. but we're human beings, and, when it's time to go, there comes a point when, it's wrong to deny death, okay?" [Zach leaves room, not particularly satisfied.]

Jimmy: [A moment later] "God's plan?"

Jill: "What?"

Jimmy: "You wouldn't want the boy frozen because of God?"

Jill: "No, I wouldn't want the boy frozen because that's effectively assisting suicide, putting him in hypothermia is. . ."

Jimmy: "But you were willing to help Howard Buss die, when he wanted to give away his heart. You supported that idea." [A bit more background: Howard Buss, the mayor of the town they live in, has Alzheimer's. In a previous episode, the local judge—"Henry Bone," the same judge presiding over this case—ruled that Jill could not help Howard donate his heart to someone else prior to legal death, since that would constitute assisted suicide.]

Jill: "No, that's different."

Jimmy: "Okay, why?"

Jill: "Well, because, that could *work*. Cryonics can't."

Jimmy: "If it could, would you say yes?"

Jill: (*Sighs.*) "No. It's. . . it's still perverted."

Jimmy: "Why?" [Pause] "*Why?*"

Jill: "Because. . . he's trapped nowhere. . . I mean frozen. . . what's. . ." (*sighs*) "Okay, if we had taken Howard's heart, he would have died, but *he* would have surrendered to death. Keeping a person frozen, suspended so that you can bring him back, he's neither in life or death. How can his spirit, or his soul. . .?"

Jimmy: "*What* are you talking about?"

Jill: [Pause] "I don't know. I don't know."

[Pause] "But Jimmy, there's got to be some kind of afterlife, right? And, I think that this cryonics voodoo would preempt that. You'd be suspended. . . in nowhere. . . forever. You wouldn't be in heaven. And you wouldn't be on earth. You'd be *nowhere*. That's gotta be worse than hell."

Jimmy: "You really believe in heaven and hell?"

Jill: "Well don't you?"

Jimmy: "I believe in God. I believe that all of us have a spiritual thing, inside. But dead is dead. When you're gone. . . you're gone."

Jill: "*How* can you *think* that?"

Jimmy: "How can *you*, a doctor, make a medical judgement based on your belief in an afterlife?"

Jill: "I'm not doing that. I'm just saying that medical science has a boundary. I don't know where the line is, but cryonics is on the other side of it!"

Jimmy: "Uh-huh. Well I believe everyone has a right to their religious convictions. But if my son gets ill, if Zach contracts leukemia, and there is a cure. . ."

Jill: "You would freeze him?"

Jimmy: "I don't know! But I wouldn't say, 'Let him die, it's God's plan!' and I would like to think you wouldn't either!"

And so goes the rest of the show. In the courtroom, we get the expected testimony and lawyerly arguments on both sides of the issue. Even more interestingly, there are several scenes set in Bobby's and Zach's classroom in which the children ask the teacher (who is also a local Pastor) about death. Most poignantly, the kids demand to know why it is that adults never give them straight answers about death. It is because of this that the following conversation occurs between said Pastor and the local (presumably Catholic) Priest. The last line is a real gem:

Priest: "Do you hear what's happening about this Hutton boy?"

Pastor: "It's grotesque, isn't it? Gary, we may have to speak up. If Judge Bone even *thinks* about granting this motion. . ."

Priest: "Then we get involved."

Pastor: "Ah but who'll listen? You picked a fine time to get caught with your Imelda Marcos collection."

Priest: "Now don't you start. The problem is we don't have any real credibility on this afterlife issue. Oh we can preach all we want, but they know! In the end, we're just guessing. . . like everybody else."

Since a lot of you probably haven't seen this show, I won't spoil it for you by giving

away the ending, on the off chance that you may yet catch a rerun of it this summer. (The show has previously been airing in the Friday 10:00 p.m. slot on CBS. Watch your local listings.) (And by the way, here's a humorous note that we got quite a kick out of: the working title used by the crew on this episode was "Frosted Flakes.")

What is most important about this show, in my view, is simply that it is written entirely without pretense, without the slanted moralizing we've come to expect from just about everyone who writes a story focusing directly on cryonics. Judging from the other episodes of *Picket Fences* I've seen, this approach seems to be par for the course. The writers like to focus on complex issues that don't always have a clear right or wrong resolution, so that they can highlight the thing that really entices them: the nobility of human beings as they try to *think* their way through life's tougher problems.

Why do I think this awareness that so many issues in life are gray (as opposed to black and white) to be such an important aspect of this show? Because as soon as most people in the world start to accept that premise, we've won most of the battle. Just admit that there is no clear, overriding reason to *prevent* us from trying this, and you've admitted enough to really start *thinking* about it.

And this is why I view this show as *pro*-cryonics. Despite that the writer took great pains to remain neutral, I can't help but expect that most people who view this show will side with the Huttons. Cryonics makes sense. The cryonics advocates in this episode sound more rational most of the time because *choosing any chance at life, however slim, over certain death will seem most rational to most people most of the time*. And in an arena where there is no preordained answer to the question, I think this becomes obvious to anyone who really has the faculties to think. All we really need, then, is to be given a fair chance to present the facts, so that people can decide for themselves.

This show certainly gave us that.

The Past, the Present, the Future, and Everything

Robert Ettinger's Presentation to the 1994 Sixth Annual Venturist Festival

Transcribed by R. Michael Perry

Let me, on behalf of Mae and myself and the rest of us here, express thanks to Dave Pizer and Trudy—Trudy especially—and to Mike Perry and all the other people of the Venturists and Alcor for their generous hospitality, and of course to Mr. Laughlin for his very kind hospitality.

Dave asked me to talk this evening about the genesis of *The Prospect of Immortality*, so I'll talk a little about that. In addition I'll consider the early cryonics movement, the present situation, the future, recruitment into cryonics, and research.

In 1926 Hugo Gernsback started *Amazing Stories*—essentially the first science fiction magazine—in my neighborhood. I was about 8 or 9 at the time. My father bought the magazines and I read them too. I grew up with the understanding that obviously we would one day conquer aging, and would

be immortal. And then of course, I looked around, and it was apparent that we wouldn't be immortal any time soon, though I never did lose confidence that it would happen one day.

Then in the early thirties there was a science fiction story published by Neil R. Jones, *The Jameson Satellite*, about a Professor Jameson, who had arranged to have his body put into earth orbit after he died. The author mistakenly believed that it would be near absolute zero out there. The professor in the story wanted his body preserved at that temperature indefinitely, so in the story this was done. His body was put into earth orbit, human civilizations rose and fell, and eventually humanity became extinct. However, millions of years later an alien race came by—these were sort of cyborgs, organic brains with mechanical bodies. They had advanced technology, and

“Millions and millions of people know a little bit about cryonics. Millions and millions have it in the back of their minds that someday they're going to do something about it. Always all this stuff is growing and fermenting below the surface, and someday it's going to break through.”

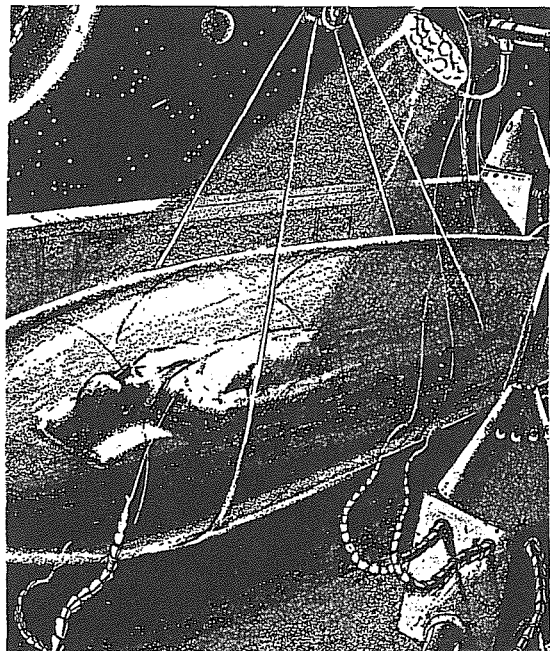


Bob and Mae Ettinger (front) with Bob and Margaret Schwartz.

they found Professor Jameson and revived him—his brain, that is (all you neuros take hope!). They put it into one of their artificial bodies and he went on living.

Well, it was immediately obvious to me that the author had missed the main point of his own idea. That is, if it made any sense to expect that you might be rescued from frozen storage by aliens after millions of years—why not 100 years from now by our people, and why just for one eccentric, why not everybody? It was obviously the right thing to do but clearly I was in no position to promote it. I just assumed that since it was so obvious people in positions of power, prestige and influence would recognize it sooner or later, and things would be taken care of. But of course that didn't happen.

Then the war came along and I was wounded in Germany just before the Battle of the Bulge. Among other things the war taught me that the so-called survival instinct isn't what it's cracked up to be. I think that lesson has been hammered deeper into my mind ever since. And it applies even to me! I remember one time I was observing; The Germans were retreating. They were over on the next hill or ridge. I walked out into the open to get a better look, and a sniper fired at me. The range was pretty far, and the first round was a few yards off, but if I'd had an ounce of sense, if I'd had any survival instinct, I would have dived for cover, or run for it. But I didn't. I was more interested in showing that son of a bitch that he couldn't scare me, and I just sauntered off, just slowly walked away, until I was out of his sight. Stupid!—but, a lesson. A great many things are more important to people than living, at least for all practical purposes. Theoretically, they're not, and



Professor Jameson of Neil R. Jones' 1931 short story "The Jameson Satellite" awaits revival.

under some circumstances they're not. But under other conditions, and in fact, most modern circumstances, the survival instinct is way, way down on the list of priorities.

On the day I was wounded, I was a second lieutenant, directing mortar fire. I had to stand up to see. The rifleman next to me was prone—as of course he should have been—but the same shell that got me through the legs got him through the head and killed him. It was just dumb luck.

I was in the hospital for four years, and of course had time to think. One of the things I thought is that I'd better do something about this freezing business because nobody else seemed to be doing it. I didn't know how to promote it because I had no prestige, no standing anywhere, no important credentials of any kind, so I thought, well, I'll write a science fiction story. And I did. In 1947 I wrote a story called "The Penultimate Trump." [See the May, 1991 issue of *Cryonics* for a reprint of this story.—Ed.] It was about a millionaire that had himself frozen, and so on. The point was that it set forth the primary thesis. It was published in 1948 in a magazine called *Startling Stories*. And of course it didn't make a ripple.

So, time went by and I still had no credentials or any way of wielding influence. Nevertheless as I got older it became clearer that I couldn't wait too long because nobody else was doing it. All these smart people were blind apparently. So in 1960 I went to a little more effort. I wrote up a 2 or 3 page flyer focused on the insurance aspects of cryonics, because I figured that this would open an immense, new, life insurance market. People would need all this extra insurance to fund their cryonic suspension. I mailed it to several hundred people chosen more or less at random from *Who's Who in America*, but there was an extremely small response. It became clear that, even though this idea was so simple and so obvious to me, nevertheless it would require at least a book length exposition to make it credible to most people.

So I wrote a little book, the first version of *The Prospect of Immortality*. I published it myself—it was about sixty pages or so, if I remember correctly. I had a couple hundred copies run off and sent them out to a variety of people, including Fred Pohl, who was then editor of a science fiction magazine, *Worlds of Tomorrow*. Fred became interested, and had a lot of connections, including a radio program run by Long John Nebel, who was the premier all-night talk show host in New York. Fred went to considerable



Evan Cooper

length to publicize it and to get me invited to Nebel's program and various others. On one of Nebel's shows there was Fred and myself and Nebel and Victor Borge, and this went on all night. There were lots of telephone calls, lots of inquiries. Anyhow Fred arranged a lot of talks with speakers and presentations, and I got invited to a lot of things. And then it came to light that Ev Cooper had also published a book privately, in 1962, which he called *Immortality: Physically, Scientifically, Now*. (Mike Perry has had that republished.) [To order this through Alcor, see the Order Form on page 36.—Ed.] Ev got in touch with me, and the upshot was that Ev started an organization in Washington called the Life Extension Society. He finally got a few dozen people interested, and started a small newsletter. A little later, Curtis Henderson, Saul Kent and others started the Cryonics Society of New York—including a young fellow named Karl Werner who coined the word "cryonics;" that was the first time that was used. And so on—the movement grew but it grew very slowly; I won't go into a lot of further details.

The way my book got published commercially in 1964—this is the version of the book most people are familiar with—was a little offbeat. I had tried to interest some publishers. One or two of them said it was interesting but it wasn't book length material. In fact I think it was Macmillan that said the book was unique (which I thought a remarkable encomium), but it wasn't long enough. My brother Alan knew a philosophy professor in the northeast somewhere. I wrote to him and he suggested I get in touch with one of his relatives who was a junior editor at Doubleday, a man named Tom McCormack. (He's now president of St. Martin's Press.) Anyway, he got the book and read it. He thought it

was good too, but needed more length. So I added some more to it—not padding—there was really a lot more that should have been said. The expanded version he sent in for scientific evaluation. He wanted it to be stamped kosher on the scientific side—so guess who he sent it to: the well-known science and science fiction writer, Isaac Asimov. And Asimov said yes, it's okay, the science is all right, there are no blunders in there, and it might work. So I got a contract with Doubleday.

Of course the irony is that Asimov was against it, purely on what I suppose he would call ethical grounds: If you had people living indefinitely, all the old men would be frozen into positions of power. The young men coming up wouldn't have a chance—and besides that, it would be too boring. Besides that what was important was not any individual life or even the life of humanity, but the growth and advancement of life and intelligence in the abstract. If you want to make that concrete, he was saying in effect that the important thing is if, for example, on some planet of Aldebaran, a million years in the future, a race of giant spiders finds a way to spin more beautiful webs—that is important! Whether you live or die, or humanity lives or dies, isn't

important.—Go figure.

My own theory is that most people—not all of course—but most who are in positions of power, eminence, influence, prestige or wealth, or are very successful in any way, are poor candidates for recruitment into cryonics. There are several reasons for this. One is, they're just too busy. They've got a million things to do, they've got no time to pay attention, and you just hardly can get their attention. Besides that, they're usually protected by ranks of flunkies. In other words, if some person of influence, the President of the United States, say, were to hear of this, he'd say to one of his flunkies, "find out if there's anything in it." And the flunky in turn would give the job to some other flunky, who would go off to the head of the chemistry or biology department at some university and ask if there's anything in it. If he said no, then it would be passed back up the chain. Or if he said maybe, well—all the flunkies ever think of is protecting themselves. They would much rather take a chance of failing to say yes to a good idea, than of saying yes to a bad idea. So that's another aspect of it. Beyond that there's the Adolph Zukor Syndrome. Adolph Zukor was a movie pioneer. He was immensely wealthy later in life, and one of

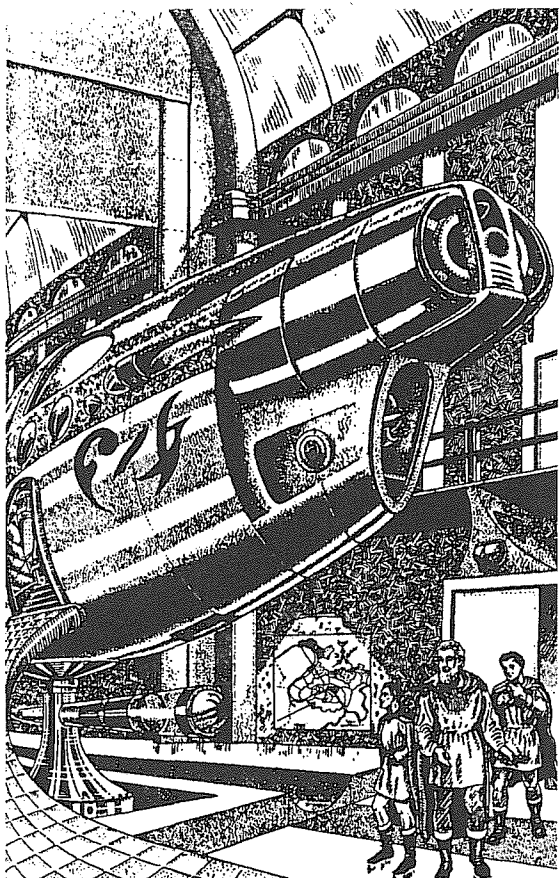
our people, Bob Brakeman, had an opportunity to meet him socially over a period of several weeks. He talked with him extensively about cryonics. Zukor agreed, "Yes, it's a great idea, perfectly rational, it could work." Well, would he sign up? "No." Why not? "Because my friends and relatives would look at me funny." That's right. He'd rather die than have his acquaintances think he was peculiar. He was more concerned with their continued approbation than with his personal chances of living. So it's not the same for everybody, but all of these things put off various people.

Even so, there was a lot of public interest in cryonics back in the '60s. Some of the people expressing early interest included: Senator Daniel Patrick Moynihan, who was in a TV studio coincidentally with me and sought me out afterward; some

prominent Texans including politico Don Yarborough and banker Harlan Lane (who eventually joined Cryonics Institute, after many years); the psychotherapist of A&P heir Huntington Hartford (who failed to persuade Hartford); brassiere salesman Steve Milgrim, who said his friend Leonard Gold would put "a million dollars cash" into cryonics (Mr. Gold didn't think our advertising should include photos of hardware or surgery: "If you want to sell a laxative, you don't advertise a picture of a toilet"); Jackie Gleason, who was turned off by what he perceived as an antireligious bias in cryonics; Bill Albaugh, one of Ev Cooper's friends, who ran for political office on a cryonics platform, promising more than any other politician in history—and lost; Elvis Presley's father, according to Bob Brakeman, but too little too late; a Roman Catholic cardinal—and many others I don't recall at the moment. Some of them are still thinking about it, no doubt.

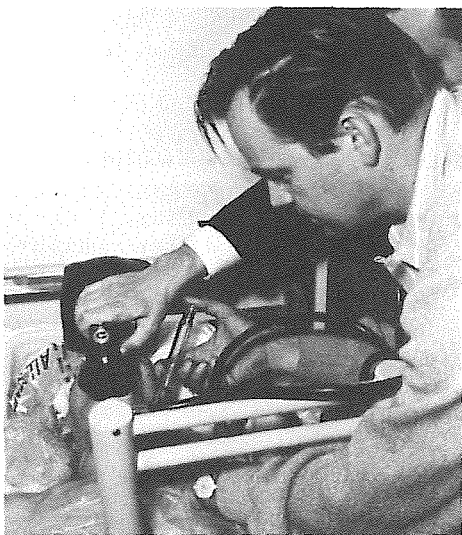
I was on most of the well-known talk shows. I was on Johnny Carson several times, and Mike Douglas, Merv Griffin, and Steve Allen. With Steve Allen I made one of my main mistakes. Steve invited me to California to be a guest on his television show, and paid my way, and I naively, once I got there, accepted other invitations. I didn't realize that was a no-no. When someone invites you somewhere and pays your expenses to appear on a television show, you don't go on competing shows, or other shows, on the same trip. So he was peeved about that, and who knows, possibly otherwise he might have had a personal interest. He did express such an interest, publicly, in that he had more things to do than he could accomplish in ten lifetimes, that he would certainly like to live much longer, and so on, but I gave him this personal offense inadvertently out of ignorance and stupidity, and that wrote him off. A lot of other people were written off, too, for various reasons.

Stanley Kubrick, the film director who created the movie *2001*, was one. He happened to see my book, was impressed, bought dozens of copies, gave them to his friends, talked to me, and so on. But somehow at the same time, a fellow named Ben Schloss got tangled up with him. Ben was a biochemist turned would-be entrepreneur and businessman, and he was looking to make a buck. He formed some kind of organization, and arranged for me, himself and several cryobiologists to meet with Stanley Kubrick and some of Kubrick's wealthy friends in New York. We did, but that was pretty much a total disaster, partly because the medical people took the position that you should not use unknown methods, even if the patient has no other chance. Besides that Ben Schloss ripped them off, basically. He had set up some kind of "research orga-



This illustration is from Ettinger's "The Penultimate Trump," written in 1947. The short man on the left has been revived after 320 years of frozen sleep; the tall man in the center is his 14th generation descendant.

“The biggest disaster of all, probably, happened in 1967 after James Bedford was frozen. There was a big groundswell of public interest, and seven pages of Life magazine were devoted to the freezing. But just then there were two catastrophes that happened almost simultaneously: the Apollo astronauts were burned up, and there was a huge snow storm in Chicago. The snowstorm held up the presses long enough that they were able to substitute the Apollo catastrophe for our story”



Robert Nelson simulates injection into James Bedford at his freezing, January 12, 1967. This photo appeared in the Life magazine article.

nization,” and he got some money out of Stanley Kubrick, and there was nothing to show for it, so I guess Kubrick got turned off too.

But the biggest disaster of all, probably, happened in 1967 after James Bedford was frozen. There was a big groundswell of public interest, and seven pages of Life magazine were devoted to the freezing. But just then there were two catastrophes that happened almost simultaneously: the Apollo astronauts were burned up, and there was a huge snow storm in Chicago. What makes the latter relevant is that Life had its main press runs in that city. At the time it had a circulation of around six million. The bulk of those were run off in Chicago and the rest elsewhere. The snowstorm held up the presses long enough that they were able to substitute the Apollo catastrophe for our story. Ours got into only one or two million copies and went not to major population centers but elsewhere. There was only a small fraction of the impact that otherwise would have been felt, and it's very conceivable that those disasters cost many millions of lives. Al Rosenfeld was the science editor of Life at the time, and he did a very nice feature article. If it had gotten into all those copies of the magazine, that might have gotten us off the ground right there. It didn't happen, and as a result things went very slowly.

What did I accomplish that others had not? Did I contribute anything new? Very little—but that little was important.

Preserving the body for later revival was not new; the Egyptians had a form of it—and maybe they weren't even too far off, except that they discarded the brains. Suspended animation by freezing was not a new idea. Reviving frozen bodies was not a new idea. Revival of apparently dead people was not new—and in fact is being practiced in hospitals all over the world. What was new—or at least rarely appreciated—was the combination of concepts and their implications.

1. The relativity of death. Even today, even with CPR reviving thousands yearly, very, very few people—very few physicians even—truly understand that “death” is a prognosis, not a diagnosis. You are “dead” when a doctor decides you will never be revived. Death is not necessarily fatal.

2. The relativity of the “irreversible.” Again—almost the same thing in different words—very few truly understand that damage “irreversible” today may be reversible tomorrow. We can not only accept “death” but we can also accept freezing damage without loss of hope.

3. The curability of senescence (as well as all other diseases). Again, very few take seriously the prospect of curing the disease of “old age,” even though this prospect is nearly certain. We can not only accept

“death” and freezing damage, but also aged patients without them facing reanimation still suffering from senescence.

Put 1, 2, 3 together and we have a formula for immortality. I didn't put them together persuasively enough to convince many people, but it was enough for a start at least.

Despite the slow start, the movement did continue to grow, and in recent years, largely because of the energy shown and publicity obtained by Alcor, it began to grow faster. Another factor is that the scientific climate is gradually becoming better. Every year, almost every day, you hear of breakthroughs in science, or advances at least in technology, that make our position more credible. More and more marvelous things are happening, more diseases are being cured, et cetera. I thought it was obvious; in fact I've written a booklet, based on probability theory, that our chances of resuscitation by future technology are good (though unfortunately this kind of argument doesn't cut much ice with most people). A few years ago, too, however, starting around 1987, we got the scanning tunneling microscope and a lot of parallel technologies. We now can image on a molecular and atomic basis, and in some cases even manipulate individual atoms. All of this gradually builds up and people begin to think our aims and chances of success are more reasonable.

So at present what do we have? We have several organizations, or groups of organizations. There's Alcor, of course, the largest. There's Cryonics Institute, the second largest. (Incidentally, a lot of people don't seem to realize that, and in one way CI is the largest—it now has more full body patients.) Then there's American Cryonics Society, which does not have its own facility but is a sign-up and overseeing organization. You also have Trans Time. Then of course there's the new group of organizations that Saul Kent, Brenda Peters, Charles Platt, Mike Darwin and others have formed. These are centered around CryoCare, which subcontracts with other organizations, particularly the new ones they've formed, BioPreservation and Paul Wakfer's CryoSpan (the new CryoSpan, not the old, New York, 1960s organization).

There have been some fairly nasty mistakes in the past, of one kind or another, but those appear to be mostly over now, at least the worst. And it's probably also true that, for the most part, the organizations offer options sufficiently different that it doesn't make sense to put great effort into direct competition. (This is so even though ACS and CryoCare are both subcontracting and overseeing organizations.) If we merely let the public know we are available, the differences are sufficient that most of the prospective members or customers

can simply see what options are available, and choose the ones that suit them best. I think that's probably what's going to happen.

Cryonics Institute is going to take a higher profile pretty soon I think. A major reason few people know about us is that in the past we've kept a fairly low profile, mainly because our facility doesn't make a good impression. It's a small building, and neither the building nor the location are the kind to brag about. We haven't had any problems there; we've never had a break-in or attempted break-in, but nevertheless it's not impressive.

We have a verbal agreement, which we'll be able to formalize this week, to buy a building in one of the exurbs. It'll be much larger and nicer, and at that point we should be able to raise our profile and get a little publicity—which I think will help everybody.

Now—what about the future? First of all let me emphasize that, in my opinion, we are irreversibly on a growth trend. We have survived. We are gaining momentum, although not a tremendous amount so far, but the tide is with us. The tide is coming in, and as I suggested before, every day our position becomes more credible. The public and the media are becoming more friendly, and I don't think it's possible for this trend to be reversed. The organizations are going to be making it a thing to consider. Whether some of us as individuals are going to make it, is another story. That's where we have to refight.

There are several aspects to this, and of course I can't in one short evening offer even any complete suggestions let alone complete plans of action. But I do have a few thoughts. One is that Hugh Hart recently sent me a clipping about a number of psychologists who have been looking at the way people make important changes in their lives—the way, for example, they give up smoking or something else that is bad for them, or do something that is good for them. And they found that they rarely do it on an instantaneous decision basis. Now it does sometimes happen. Saul Kent, for example, tells me that he sacked out on a beach and read my book in one afternoon, and that was it. He was instantly converted, became an activist, and still is. It's happened to a few other people. On the other hand, for some of our best people, it took much longer. Walter Runkel, who was our Vice President for many years, one of our mainstays, now one of our patients, attended several Immortalist Society meetings over a period of a year or more before joining. And so on. It's not a matter of intelligence. You can't pin it down, you don't know what the psychology is. But in any event, some people are swift, some are slow.

The psychologists quoted in this newspaper article found that for most people it was very, very slow. It consists of several stages; they gave them names (like Kubler-Ross gave names to the stages of dying!). They called them: pre-contemplative, contemplative, preparation, action, and maintenance. They said the first two stages took the longest, sometimes several years each, and furthermore, many people, perhaps most, had to go through the whole cycle several times. So what I'm saying is that it's not unusual for it to take a long time for people to make this change, and in light of the revolutionary character of the change we're talking about, it's even less surprising.

We can look at this in a couple of ways. We can be negative and say, "In thirty years, look how little we've accomplished: only fifty people frozen worldwide—fewer than a thousand active members—how could we have done so poorly?" Or we could be more positive and say, "We're looking at the most profound revolution in human history. We're looking at the overturning of thousands of years of evolution and acculturation and tradition, and nobody's been lynched. A miracle! We did better than the Bolsheviks and Mensheviks!"

Incidentally there was something on the CryoNet the other day. Somebody said the real enemy was "the People's Front of Judea." This was a reference to an old Monty Python movie where the Jews were in revolt against the Romans, but there were two separate revolutionary groups. One was called the People's Front of Judea, and the other the Judean People's Front. They both hated the Romans, but they hated each other more. Draw a parallel if you wish. [laughter] Anyhow, I think we're past the point of the Judean People's Front.

What I'm getting at is, among other things, don't make the mistake of assuming that because there's so little showing on the surface, nothing is happening. People who are in the pre-contemplative, contemplative and preparation stages—there are lots of them. We don't know about them, but they're there. We've had lots of publicity in the past. Millions and millions of people know a little bit about cryonics. Millions and millions have it in the back of their minds that someday they're going to do something about it. Always all this stuff is growing and fermenting below the surface, and someday it's going to break through, it's going to show. There's going to be some psychological trigger at some point. We're going to grow, at a moderate rate, hopefully at an increased rate, and at some point there's going to be some trigger we can't identify in advance and won't even be able to discern in retrospect, but nevertheless it will take effect. And there'll be an explosion of activity. Whether that'll be good or

not, is another story.

If a few hundred million people suddenly want to make arrangements for suspension and the price of liquid nitrogen goes to a thousand dollars a liter, we could have problems. But I don't anticipate that. But what I'm saying is I think you can be confident the tide is coming in. The ferment beneath the surface is there, and is going to break through one of these days.

What can we do to help it? I think we have to think of at least two main problems. There are many of them, but let me point out two. One is that we have to look at the people who are not involved at all, how to get them involved, and the second is how to work with the people who are involved, and escalate their degree of involvement.

In respect to the first, going back to this phases of change business, I think we may have focused too much, too exclusively, on the rational side of it. People don't make decisions, for the most part, on the basis of logic or rationality. People make decisions on the basis of emotions, of feelings—they believe what they want to believe. So our main problem, for most people, is not to persuade them that their chance of revival will be 97 percent instead of 83 percent—they don't think in those terms—our problem is to persuade them that they should *want* to be revived—that's all. After all, that's all the churches do. That's all that most ideologies, movements or parties do. They persuade people that they ought to want, and do want, what the sellers ostensibly have to offer. And you do that not by logical arguments, you do it by offering camaraderie, companionship, social contacts, interesting people to talk to, supportive people to be with, friends, laughter, jokes, music, dancing—all that kind of thing. I mean, why do people go to political parties and help with mailings? Because they think one political policy is better than another? Not very often!—or very much. They do it because they have friends there, and they enjoy it. It makes them feel good. They salute the flag, get prizes, get pats on the back and other bonuses. People believe what they want to believe, as I said, so our job is to make them want what we offer. That's one side of it. We've done some of that but not enough.

Most of the people already in cryonics are motivated mostly by logic. And a lot of our people are not really social animals. I'm not a social animal. I don't have any charm, any small talk—I can't tell people I encounter that I'm fun to be with—I'm not—except with my wife maybe. [laughter] But there are people who are more sociable: Steve Bridge, Dave Pizer, and among our own people, Rich Davis, one of our directors—there are lots of people like that. So that's what we need more of, to get more outsiders involved.

Now, how about the people who are already involved, but haven't done much? I guess for them you've got to use reason a little, but mainly you've got to get their attention. Because what they've got to understand is that even though they have a chance now, it isn't the best possible chance. To have the best chance we need more numbers, better technology—a lot of things. If they can help improve that, according to their means and abilities, they should. Some people, of course, are fanatics and work 26 hours a day, and are self-starters—but most are not. Most tend to let somebody else do the work who wants to, and do not contribute any more than they feel obliged to. What they must be made to understand somehow, is that their personal chances depend to some extent—the exact amount is unknown but is certainly non-zero—on how rapidly we grow and our capabilities improve.

For example, let's consider research projects. What projects are we doing? In terms of actually improving the biology of suspension procedures, most of you know, for example, that the Cryonics Institute did sheep head research a couple of years ago, and we did it by methods that according to Greg Fahy have not been done before. The principal difference was that we used an immediate, high concentration of glycerol rather than starting out with a low concentration and going up. We sent our specimens through one pass of the circuit, then cooled them down very slowly, much more so than others have done. We typically take a week to cool down to dry ice temperature, and another week to cool to liquid nitrogen temperature. As a result we found that at the naked eye level there was no cracking in the brains, and we got good reperfusion after rewarming from liquid nitrogen temperature, and no apparent leakage in the vasculature. This contrasts with results that others have reported, of cracking at all levels, from the naked eye down to the electron microscope. Many people think this cracking is the most serious problem we have.

What could account for our apparent results? There are three possibilities. One, of course, is that there is cracking, but it's at the microscopic level, not the level we've seen. Another possibility is that there is no cracking but there's some other kind of damage with our method that more than offsets the lack of cracking. And a third possibility is that it really is a better method, we do avoid cracking, and it's easier than we thought—that would be a kicker, wouldn't it? Anyhow, we're working on it; we have a team of Ukrainian scientists working now. There is Dr. Yuri Pichugin, a cryobiologist—and Dr. Gennadi Zhegunov, an electron microscopist who was recently appointed chairman of the Department of

Biology at Kharkov Medical University, a prestigious position. They have completed the first phase of their work; by September they expect to have either confirmed our results or not, and to have extended them, and studied the results in much more detail than we were able to do. So that's somewhat hopeful.

There's also a Russian team that may do the same thing. Alcor is going to try to repeat those experiments also, but they haven't done so yet because they had a problem obtaining fresh sheep heads in the Phoenix area. I would like to see all three groups, the two European ones and Alcor, repeat our experiments, and of course if they all agree on the results, that'll settle it one way or the other. If they disagree, there'll have to be more work done. So there's a big field there.

Regardless of what happens, even if it turns out that our procedure is better than the others and does avoid cracking, it still isn't perfect. We'll have to try to revive the sheep brains after that, but my guess is that they would not be capable of being revived, even if the procedure did avoid all cracking.

There'll be lots of further work to be done, and of course there's need for a lot more money to support it. I'm told that at the present time in Russia a scientist or researcher gets about \$300 a month and in the Ukraine about \$100 a month. We can get the work done there a lot cheaper than here. Another possible advantage, by the way, is if these Europeans start turning out reports that are published in scientific periodicals. The American cryobiologists who have been so negative all along may be given a little *Enderstutz*—a jab in the rear.

So the biological research does need a lot of initial support. There will need to be a lot more of it. It has been going on at Alcor and it will be again. It's going on at BioPreservation. We'll be doing some more of it ourselves, in our own new building. (We've had to call it off temporarily because we didn't have the space for it anymore.) And then the Europeans are going to be doing it, and all of this is going to need money.

The other very obvious and very important area that needs to be funded is the panic button. Some of you probably know that for about \$400 you can buy a navigation system that uses satellites and will inform any sportsman, explorer or whomsoever exactly where he is at any particular moment. It'll give the longitude and latitude within a few yards, anywhere on earth. I read recently about a college in New England that uses a system like this, but they also had it hooked up to a computer, and they had the campus mapped out in coordinates. Any student, for only \$300, could have a panic button. If pressed it would

inform the computer and headquarters personnel would instantly know exactly where he or she was, generally what room, what floor. They could get the police there within minutes or sometimes seconds.

Some of you know that one of our own people, Jack Erfurt, our secretary for many years, died a year or two ago, and we didn't know it until several hours later. He died at home of a heart attack in bed, and wasn't found for several hours, a very bad deal. I'm not saying he has no chance—he does have a chance—but several hours of warm ischemia isn't good.

So, for our purposes we really need something better than the simple panic button. It would be a good thing for people who are homebound or bedbound: If they had the consciousness and strength to press the button then help could be sent wherever they were. But most of us, who move around a lot, need something better than that, and we also need something like a dead man's switch that won't have to be pressed but will activate itself. What we need is something that uses existing technology, and is adapted to a wrist monitor, that will activate itself when the pulse stops, and will locate us by map coordinates and by street number anywhere in the country. An off-hand guess is that it would cost a few million dollars, considering both hardware and software. (And the hardware would be almost trivial; all of it already exists in one form or another.) The software part of it, mapping the whole country so that from the pulse you send out, the appropriate local agency will know exactly which address to go to, will cost money and take time. But it's very important.

These, then, are some thoughts on the cryonics movement: how it started, my own involvement, where we are now, where we ought to be heading, what to expect in the future. In closing, I'll consider a line from the *Epic of Gilgamesh*, of several thousand years ago. Gilgamesh wanted to be immortal, and make everybody immortal. He flung down his challenge and said: "I will break the door of Hell, and smash the bolts; I will bring up the dead to eat food with the living, and the living shall be outnumbered by the host of them." And I say, "Go for it, Gilgy."

Thank you.

COOLING DOWN

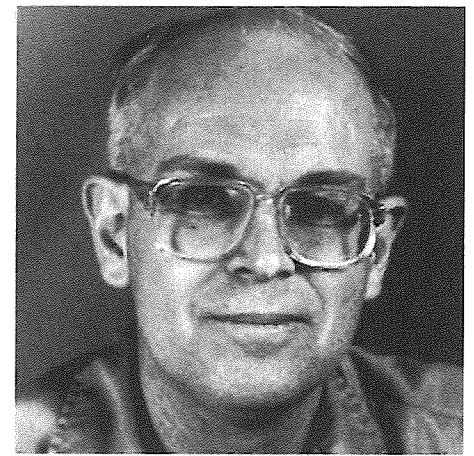
By
Hugh Hixon

Illustrated by
Ralph Whelan

Everyone says cooling a patient from 5°C to -196°C should be easy to automate. I know I said it back in the late 70's, when I was part of the Cryovita suspension team. Given a reasonable budget, I suppose it is; but cryonics organizations don't have reasonable budgets. They have survival budgets. And major projects that aren't absolutely essential get put off indefinitely. In any event, this is history. In April of this year, Alcor did a suspension, and the cooldown protocol was entirely controlled by computer. As far as I am aware, this is the first time that this has been done in the history of cryonics.

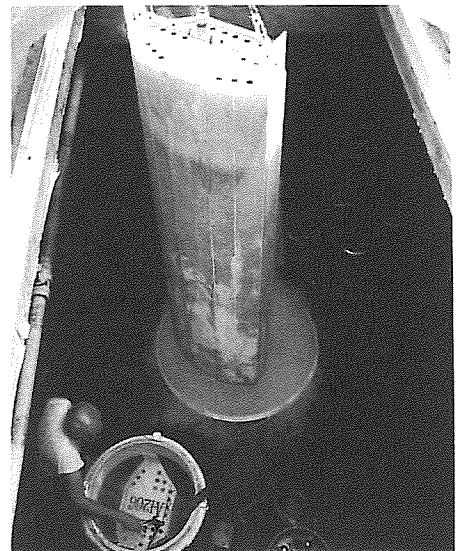
The object of the suspension procedure is to arrest deterioration of the patient after the pronouncement of legal death. There are two fundamental ways to achieve this: chemical, and physical. In general, the chemical methods are forms of embalming. There is only one physical method: extreme cold. There have been a number of proposals to preserve people at ambient temperatures chemically; there are some very impressive chemical preservation methods available, primarily for pathology work, and not having to maintain cryogenic temperatures for a long period would be a real advantage. These have uniformly been rejected for this reason: Organisms have been demonstrated to survive cryogenic storage; no chemical method can claim this. Chemical preservation methods are not at this time reversible. Ultimately, it may turn out that cryogenic storage was not the right method to use, but we do not now know enough to do any more than place our bet.

There are a number of ways to cool a suspension patient, and they have all been used. First, of course, there is simply dropping them into LN₂, and this was done often in the



early days of cryonics. This gives the fastest rate of heat transfer, and has the virtues of speed and simplicity, but is likely to result in mechanical cracking, as the outside of the patient contracts faster than the inside. For sufficiently small specimens, such as bacteria or individual cells, it can work quite well; but for large objects such as human patients, problems of scale make it totally unacceptable.

All other cooldown systems attempt to regulate the heat flow between the object and the cold sink (refrigeration, dry ice, or liquid nitrogen). The most basic of these couple the object directly to the sink with an intermediate liquid or gas. Because of their high heat capacity, liquids can remove heat at a high rate with a small temperature difference. For a gas to do so at the same rate requires a much larger temperature difference; which results in undesirable surface contraction. The fundamental law here is that the rate of heat transfer is proportional to the temperature difference. The accompanying proportionality factor is somewhat more involved, depending on such things as the boundary layer, circulation, heat capacity, molecular weight, dif-



Credit: Carla McFee

fusion constant, insulation, etc. In any passive system, the upshot of this relationship is that the initial cooling rate is faster than the final cooling rate. Since we have 200°C to traverse, the ratio of initial to final cooling rate exceeds 20-to-1. In practical terms, the initial rate is so great as to create unnecessary and undesirable mechanical stresses, and if the proportionality constant is reduced (say, by insulation) to produce a reasonable initial cooling rate, the heat transfer rate near the final temperature is impractically slow.

The next step in regulation is to perform the cooldown as a series of steps. This is usually done by adding refrigerant at intervals and waiting for the system to approach equilibrium. Make the temperature inter-

vals small enough, and we will get a reasonably smooth cooldown curve (the heat capacity—or “thermal inertia”—of the patient and the rest of the system help to smooth the curve). Perform enough of these cycles, and we get to the end. And here is the problem: To do this properly requires checking at an interval of 15 minutes or less for over a week. Done manually, the effect on the people in this feedback loop is not good. It takes two to four people for the necessary continuous coverage, they can’t do much of anything else, and turning them temporarily into control automatons is not easy and not pleasant. Some do well at the job, some do poorly, but no one has ever liked it.

For several years, we had a system for

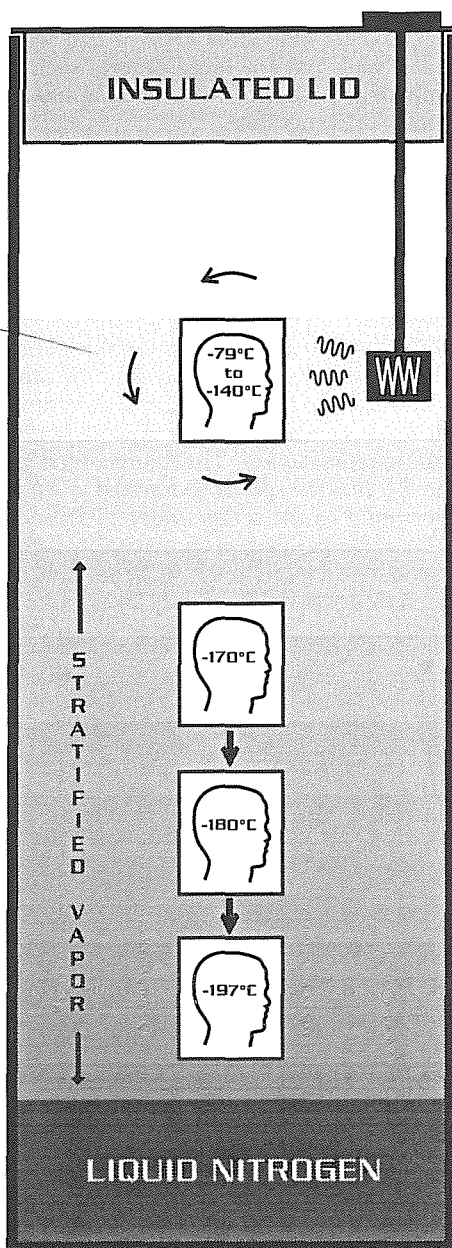
LN₂ cooldown that was partially automated. An industrial control relay injected LN₂ at regular intervals. The results were erratic. It was necessary to hunt for a balance in the system, or it ran away from us. And the balance was very narrow; small differences accumulated very rapidly. There was a little control and a lot of illusion of control.

That was for whole-body suspensions. For neuropreservation cooldowns from dry ice to LN₂, I devised a different and less temperamental system. In LN₂ dewars, with cold liquid in the bottom and ambient temperature at the top, the natural tendency is for the system to stratify, so that there is a natural and stable temperature gradient in the gas. In practice, the temperature goes from -197°C at the liquid to about -140°C under the dewar lid. The gradient changes most rapidly near the liquid. By progressively lowering the patient in the dewar, we achieved a stepwise temperature descent. The interval from -78°C to -140°C I dealt with by creating a heated convection zone under the lid. Cold gas rising up the dewar was heated by a resistor bank powered by a variable autotransformer. The result was a stable temperature zone in the top of the dewar. Before adding the patient to the system, the power to the resistor bank was increased until the zone was at dry ice temperature. Then the patient was suspended in the zone, and the power was slowly reduced (see illustration). Results were good, but slow. When the power to the resistors was zero, we lowered the patient slowly stepwise down through the temperature gradient. Near the liquid, the gradient got steeper, and control got tricky.

About 1990, Mike Darwin was Easter-egging a new Cole-Parmer Instrument Company catalog and came across a new instrument; a microprocessor-controlled scanning thermocouple. It had 12 thermocouple inputs, an internal elapsed-time clock, thermocouple compensation, alarms, limited external programming, and a serial printer port. There was also a program available for a computer to read the serial port. The price was under \$700. Jerry Leaf bought the first one for Cryovita Labs, to monitor and print out temperatures during a suspension. Alcor got one to monitor patient storage. Alcor now has three.

About 1992, Keith Henson took on the cooldown problem. He modified the computer program that came with the scanning thermocouple to provide a simple control loop, and he built a breadboard neuropreservation cooldown system in a box for the descent to dry ice temperature. The box was the interesting part. Without getting into a lot of detail, it had some neat prototyping tricks, an ingenious refrigeration system, and it worked. It did however, bear watching, because it was an extraordi-

Something Old...



Depicted here is the previous system for cooling neuropatients to the temperature of liquid nitrogen. A resistor bank powered by a variable autotransformer created a “heated” convection zone near the lid. By gradually reducing power to the resistor bank, the temperature was caused to drop from -79°C to -140°C.

To further reduce the temperature from -140°C to -197°C, the convection apparatus described above was removed, allowing the nitrogen vapor to stratify. Then the patient was simply lowered periodically. The ambient temperature in the nitrogen vapor dropped as the patient neared the liquid.



The neuropatient cooldown apparatus, here next to its container. . .



. . . and here inside of it

nary bug trap. Just about everything in it did go wrong at some point. Later, I built another neuro cooldown unit, and I am convinced that I avoided a lot of problems by carefully evaluating Keith's box. Which is, of course, exactly what a prototype is for!

Due to business commitments, Keith's involvement in the cooldown project was subsequently reduced, but there was now something to work with, and Scott Herman and Mike Perry undertook to complete the programming part of the project. Scott also built the relay box that interfaces between the computer and the physical part of the system. Since they have a lot of things to do at Alcor, their progress has been off-again, on-again. Of particular note, Mike Perry wrote an adaptive subroutine using fuzzy logic to determine the switch-on interval.

In the suspension of April of 1993, they made their first live run, as the computer controlled the descent to dry ice temperature. Further work before and after Alcor's move to the Phoenix area positioned them for a mad sprint to a functional system at the suspension that Alcor performed in April of this year. Someone was always awake to watch it (first time, you better believe it!), but except for minor tweaks, all they had to do was load dry ice and swap out LN₂ supply dewars. Mike and Scott are now engaged in the final step, from functional to easy-to-use.

Our current cooldown scheme is done in two steps. Between 5°C and about -50°C, deteriorative chemical reactions can still take place. Thus there is a premium on rapid cooling. To avoid a large temperature difference while moving a lot of heat quickly, a liquid heat-transfer medium is used. There are a number of compounds that are liquid in the room temperature to dry ice temperature interval. A few of these are not particularly volatile at room temperature. Other properties to be avoided

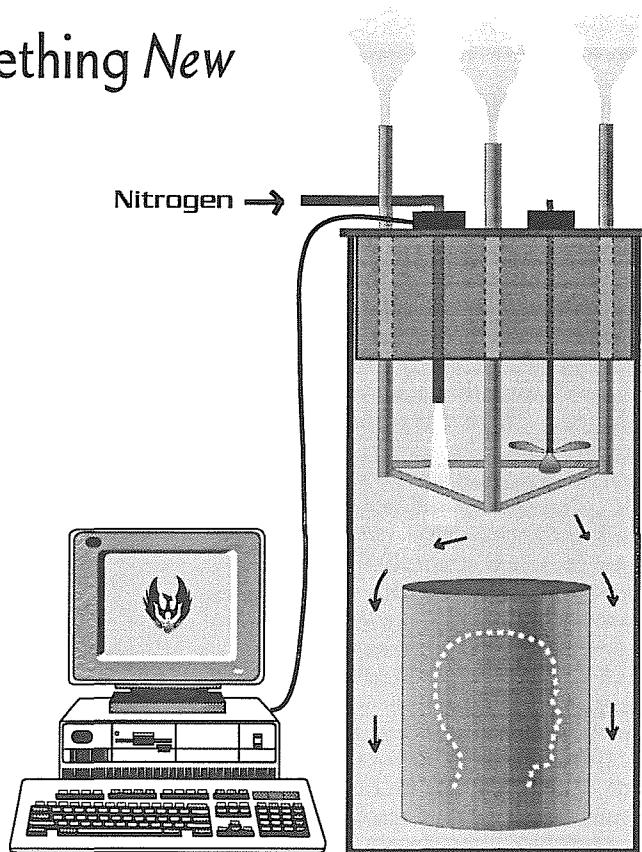
include high flammability, forming solutions with water condensed from the air (which tends to make the liquid more viscous), ability to extract water from the patient's tissues, toxicity, etc. No inexpensive compound meets all these criteria. In the early 80s Mike Darwin examined a number of more exotic chemicals, and Alcor adopted a silicone oil, a polydimethylsiloxane, as the first-stage heat transfer fluid. Its viscosity is relatively constant over the required temperature range, condensed water simply freezes out as ice, it is about as flammable as kerosene (that is, not very flammable, on a scale that includes ether,

acetone, neopentane, propyl alcohol, etc), and it is sufficiently nontoxic that we kept mice in it for a week without observing any ill-effects. Its commercial use is as a food and cosmetic additive. Its biggest disadvantage is its cost—about \$50 per gallon—which leads to our purifying it after each use. We lose several pints to various places in each suspension. We currently have about 80 gallons on hand. We refer to it as Silcool. Its commercial name is Dow-Corning DC200, 5 centistoke.

In practice, the patient, protected by plastic bags, is immersed in circulating Silcool. From time to time Silcool at dry ice tem-

Something New

With the new automated system, the descent from -78°C to -196°C is regulated through continual convection and occasional injections of nitrogen vapor through a computer controlled valve system. The computer continually monitors and adjusts the internal temperature.



Regrets

There is one simple feedback control scheme. Two thermocouples can be wired back-to-back (so that their potentials oppose each other). If one thermocouple is inside the patient, and the other outside, and refrigerant added as necessary to maintain a constant readout temperature (which means a constant temperature difference) the result will be a smooth and gradual descent. This scheme is used in old Linde cooldown refrigerators (would you believe *vacuum tubes*). For some reason, however, we never adapted the Linde units we had to our use, and the only time we attempted to implement the scheme with new equipment, it got sidetracked and dumped. Looking backward, I believe we just never mustered the will to carry the project through, until this last time.

perature is added to the circulation. For the neurocooler, this is from a reservoir tank with dry ice in it, the liquid being replaced in the reservoir by overflow from the cooling tank. For the whole-body cooling tank, Silcool is pumped into a tray filled with dry ice, which drains into the tank that the patient is in. The circulating pump in the neurocooler is a swamp cooler water pump. In the whole-body tank, it is a long-shaft bilge pump. The primary criteria for the selection of these pumps were toughness and low cost. In both units, the computer controls a gear pump that circulates Silcool over the dry ice. Direct contact with the Silcool (instead of an intermediate circulating loop) was picked because of its simplicity and efficiency of heat transfer. The gear pump, driven by a 1/3 hp motor, was selected because I believe that it is a great deal more robust than a solenoid valve and does not have to be primed with liquid to pump (that is, it can suck liquid up). An open system such as this accumulates ice that can be expected to jam a solenoid valve. All the pumps can be removed instantly for maintenance. I have taken the design philosophy here that the cooldown units are a hostile, almost impossible to work in, environment, and gone for simplicity, robustness, and ease of maintenance. The best way to avoid repair work below the surface of a very cold liquid is to design the problem out of the system.

Unfortunately, Silcool is not a liquid much below about -100°C , so the second cooling step from dry ice temperature to liquid nitro-

gen temperature is done with cold gas. The patient is transferred to the permanent LN_2 storage container, appropriately insulated,

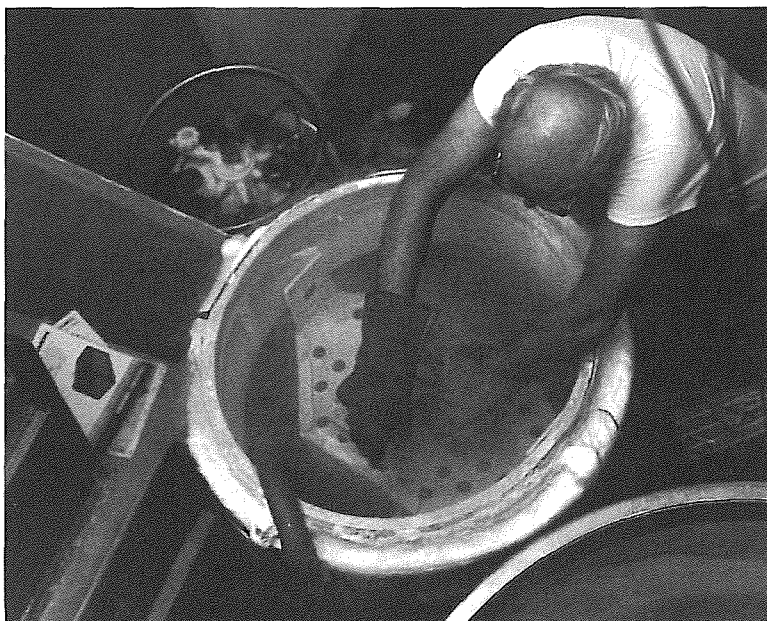
LN_2 injector solenoid valve, and gas vents is placed in the dewar mouth and the cooling sequence started. The fan is to circulate

the cold gas around the patient container and prevent stratification. The solenoid is controlled by the cooldown computer, and from time to time releases a shot of LN_2 into the circulating gas, cooling it as required by the cooling profile. The circulating fan is driven by a long-shaft motor mounted on the top of the cooldown lid. There are motors made that will work at LN_2 temperature, but they are expensive. The problem that normal motors have at low temperatures is that the oil in the bearings freezes and stalls the motor. A long shaft through the insulation of the lid gets away from the problem.

I have been involved in the problem of regulating cooldown since 1978. There has never been any question that the system that we have now nearly completed is necessary. Good control, data collection, and a better use for people than to bind them to a grueling, necessary job. We've finally done it!

To all the people who have stayed up day and night after the intense and grueling effort of a suspension to do the cooldown. Laurence Gale, Jerry Leaf, Steve Bridge, Mike Darwin, Arthur McCombs, Fred and Linda Chamberlain, Carlos Mondragon, Paul Garfield, Scott Herman, Dave Christiansen, Max More, Tanya Jones, ESPECIALLY Mike Perry, and a lot of others whose

names I've forgotten, THANKS! And.... *Never again.*



Preparing our latest patient for transfer to long-term storage.



Transfer complete, temperature probe lines are established.

and the container placed in a cooldown dewar. A cooldown lid with a stirring fan,

Credit: Carla McFee

Credit: Carla McFee

IT'S NOT AT ALL SO EASY

Computational Problems of Revival

by Thomas Donaldson, Ph.D.

Last year, Ralph Merkle, a cryonicist who has spent a great deal of time and effort advancing nanotechnology, published an article in *Medical Hypotheses* (39(1992)5-16) describing, in his terms, the computer problems we must solve to revive suspended patients. [This paper was also published in an expanded form as "The Molecular Repair of the Brain" in issues 14(1) and 14(2) of *Cryonics*. —Ed.] His plan, put briefly, would start by reading a patient's (damaged) brain into a computer, after which the computer would analyze it to discover just how to reassemble it correctly.

His article contains some calculations showing that with nanotechnology it will indeed become possible to store the location and orientation of every molecule of a patient's brain in a relatively small space. Basically his argument goes as follows: if we digitally encode the location of every molecule in the brain using 1000 atoms, we would need roughly 1000 times the volume of that brain. This would require slightly over one cubic meter, a very small space indeed.

He does go on to discuss how this space could be compressed even further, by (for instance) storing the location and orientation of cell structures, or even larger structures. The main thrust of his computations, though, aims at showing that even at the smallest unit size (molecules), nanotechnological memory systems will allow us to store a patient's damaged brain entirely in a computer.

After storing the structure of that damaged brain, the repair computer system would then work out how to reassemble it. He says that the computational power needed to analyze a data base of 10^{25} bits (the amount of data he expects to be produced by storing locations and type of brain molecules) "is well within known theoretical limits." To justify this statement, he cites three papers on the physical limits of computation. He also

observes that even more computer power would be available if necessary. As an example, he also analyzes the computer power needed for image recognition, which does in fact fall well within limits we can expect computers to someday attain. Finally, at that point, in one short paragraph, he discusses in very broad terms just what a computer might do to determine the healthy state.

Unfortunately his argument was then and remains utterly fallacious on this central point of the computer power required. Furthermore, depending on the kind of "analysis" we ask of a data base, there is quite literally no limit at all on the amount of computer time required to do the analysis. It is only the fact that we customarily deal only with problems presently accessible to us that such a statement could pass by without multitudes of computer scientists pointing out its falsehood.

In this context, it's especially inauspicious that Ralph chose *molecules* as the unit whose location would be stored. The essential problem any computer trying to analyze a damaged brain must face is that of working out how to correctly reassemble it. Correct reassembly involves putting the molecules together in the correct relations to one another, or to restate the problem, it involves finding their correct ordering. As a computational problem, this one is very well known: it is a problem from combinatorics. Furthermore, combinatorics is notoriously rife with problems which require a small amount of data but vast amounts of computation. When we consider this data-base of molecules in a patient's brain, we have a problem with a vast amount of data and should not be surprised if the computations needed require a *very* large number of computations. Image recognition simply does not provide a good example for the problem of reassembling a patient's brain.

Here is an example (quite standard) of how combinatorial problems can ex-

plode. Suppose you are a travelling salesman in the Galaxy, and the Galaxy has been completely settled. You wish to find the shortest route which lets you visit all the stars in the Galaxy without ever visiting the same star twice. There are 10^{10} stars in the Galaxy. It turns out that the number of possible paths you can follow comes to $10^{10}!$, or the *factorial* of 10^{10} . This is a very large number, far larger than any easily expressible power. Even $16!$ is a very large number. (Note: for those unfamiliar with this notion, $16!$ is defined as:

$$16 \times 15 \times 14 \times 13 \times 12 \times \dots \times 3 \times 2$$

i.e., the product of all numbers less than or equal to 16. This is a very large number already.)

To say blithely that "the computer power required to analyze a data base with 10^{25} bits is well within known computational limits" depends very strongly on just what the "analysis" may be. If the data base consists of the stars in the Galaxy, and our "analysis" aims to find a shortest route for the travelling salesman, then the statement is simply false. (For those who might want to take up the job of travelling salesman, I will say that we *do* know heuristic methods which in most cases get us close to the best route, and for only 10^{10} operations, too.)

If our repair computer knows nothing whatever about the molecules in its data-base, then the number of ways it can put them together in only one dimension comes to about $10^{22}!$, i.e. 10^{22} factorial. This is a very large number. To see just how large, we can do a little arithmetic. If we consider only the numbers in the factorial which are greater than 5×10^{21} (the last half of the product) we see that there are exactly 5×10^{21} such numbers. This means that:

$$10^{22}! > (5 \times 10^{21})^{5 \times 10^{21}}$$

This number is so large, in fact, that simply writing the number down with text of this size (and without using exponential nota-

tion and factorials) would leave us with a figure 40,000 light years long. If our repair computer processes each atom in its database at 1 picosecond per atom, then it will require a number of years roughly equal to 10 followed by 10²⁰ zeros. This is far more than the period that the Universe has existed to date. What can we do? Surely the problem is easier than that??

For one thing, we happen to know a few things about the molecules in our brain. To be precise, we know that there are a large but finite number of kinds. Since no one has actually bothered to count, I shall assume that this number is 1 million.

Suppose we try again. This time we ask, not for the number of orderings of molecules with each molecule considered distinct (notice that if the molecules are each stored in a data base, each one has a distinct tag!) but instead supposing that identical molecules may always be interchanged. Again, for simplicity, restricting ourselves to a 1-dimensional brain, our problem becomes that of calculating how many sentences 10²² characters long can be constructed with an alphabet of 10⁶ characters. This brings the problem down a good deal. We can go even farther: if we count the number of water molecules in our brain, then the number of nitric oxides, then ... and so on, we can place a limit on just how many letters of each kind can be in our long sentence. This brings things down even more. The result for the number of possible sentences is:

$$\frac{10^{22}!}{n_1! \times n_2! \times n_3! \times n_4! \dots \times n_{999998}! \times n_{999999}! \times n_{1000000}!}$$

where n₁, n₂, n₃, ..., n₉₉₉₉₉₈, n₉₉₉₉₉₉, etc. are the numbers of molecules of each of the 1 million different kinds. Note that:

$$n_1 + n_2 + n_3 + \dots + n_{999998} + n_{999999} + n_{1000000} = 10^{22}$$

(This formula gives the number of ways of putting the atoms into a sentence when you regard each one as distinct, and divides it by the number of possible choices of each atom you have.)

Clearly by introducing some further knowledge into the problem we've brought it down by a good deal. At the same time, it still remains quite large. We can make a rough estimate of just how large by making some simplifying assumptions: suppose that half our brain consists of water (not out of the way at all; we contain a good deal of water). We can also suppose that all the

other molecules are interchangeable. With a bit of arithmetic we can then show that the value of the above fraction is greater than:

$$7 \times 10^{12} \times 2^{10^{22}}$$

This is an advance, though it may not seem so. In terms of our earlier analogy, writing this number down without exponentiation or factorials would now produce a figure "only" 500 light years long.

The essential fact that keeps the above fraction from being very small is the fact that even though the denominator is itself very large, it remains a good deal smaller than the numerator:

$$10^{22}! \gg n_1! \times n_2! \times n_3! \dots \times n_{1000000}!$$

even though

$$n_1 + n_2 + \dots + n_{999999} + n_{1000000} = 10^{22}$$

Now we actually know a good deal more than the number and type of molecules in a human brain... even though many might question whether or not we yet know enough. If we seriously try to limit the problem still more, we may begin to make it actually achievable. The first point to understand, of course, is that we should not consider molecules at all; we must use our knowledge of the brain at a much higher level if we want any hope of success. Sure, the position and type of every molecule in a brain certainly provides a wonderful example of just how much data we will someday be able to store in our nanotechnological computers, but if we actually want to discuss repair we'll have to look at the problem at a much higher level.

Instead of trying to move up from molecules, let's look a bit at what we know to date about memory and the anatomy of brains. First, it seems very likely that on a sufficiently large scale, but still well below the size of a human brain, the differences between our brains disappear. After all, neuroscientists have (very roughly) mapped out the function of many different regions in our brains. Since I do not know of any quantitative discussion of this issue, I shall assume (a bit arbitrarily) that our brains are identical up to a scale of 1 cubic cm. Furthermore, it's unlikely that any cracks or other motion caused by freezing would move the pieces farther than about 1 cm.

The current neurological consensus about true, long-term memory is that (at a minimum) it causes permanent changes in

a nerve cell's synapses. A synapse is a region at which the sending and receiving neuron approach one another very closely. In fact, the connection between the two cell membranes at that point is so close that it survives homogenization of the cells. To the extent that freezing dissociates cells, it probably does not dissociate synapses.

The precise changes caused by memory still need more investigation. They may consist of the actual growth of new synapses, or some change in existing synapses. In either case, once we work out how to reconnect the synapses and the cells from which they came, we will have restored that part of our brains which carries our memories. Since our DNA should survive freezing intact, we would then have restored all the features of a patient's brain which carry his or her individuality (and presumably, the self).

How big a problem is this? Again, no one seems to have made the necessary quantitative estimates. Some points do need making, though. First, even if ice pierces all the neuron membranes, so long as the rest of the cell remains connected to a synapse, even if only by a thin bridge of damaged membrane, we know already that that synapse belonged to that cell. The synapses we must reconnect consist only of those that ice has separated entirely from both their original cells.

Since we lack quantitative estimates for their number, we can only make a very rough estimate. A mammalian synapse is about .5 microns across. With it comes other cell structures, such as the synaptic vesicles on the sending (axon) side, each containing small amounts of neurotransmitter. If we suppose (wildly unlikely) that 1 cubic centimeter of brain is packed tight with synapses, that comes to about 8 trillion synapses, i.e. about 10¹³. Neurons can have up to a thousand synapses. Ignoring the fact that neurons take up much more space than individual synapses, we may have as many as 10⁹ neurons in the same cubic cm. Assuming (again highly unlikely) that all of these synapses had been separated from their original 2 cells, reconnecting them would require that our repair computer examine no more than:

$$\frac{(10^{13})(10^9)(10^9)}{2}$$

possible connections. This comes to less than 5 x 10³⁰ possible connections. Although

*Note for the mathematically inclined. I got this formula as follows: let N be the total number of links (synapses) and P the total number of neurons to be linked. Then for every synapse we must choose two distinct neurons which it links. This gives, per synapse,

$$\frac{P \times (P - 1)}{2} < \frac{P \times P}{2}$$

Since there are N synapses, we can multiply this by N to get the number of possible connections between neurons: the formula used above. I am specifically ignoring some facts which would bring this figure down: synapses have 2 sides, and we can fairly easily distinguish these sides both on the neuron and the synapse (one is the axon side, the other is the dendrite side—sending and receiving, respectively). This will limit the number of possible choices. And as stated above, it's possible but unlikely that a single neuron will have more than about 1000 synapses. This will also bring down the number of possibilities.

this is a large number, it's easy to see that it is far less than the numbers we had to consider before.* Since (as Ralph Merkle assumes) our brain occupies about 1000 cubic cm, the total workload for analyzing an entire brain becomes 5×10^{33} .

Furthermore, to make this estimate I made some *very liberal* (and actually contradictory!) assumptions about the content of 1 cubic cm of suspended brain. The contradiction comes from the supposition that nerve cells would take up *no space*, and that we could pack that cubic cm entirely with separated synapses. Moreover, although they have no fixed upper limit on the number of synapses they may have, neurons usually have no more than about 1000. Even more, an unknown number of synapses remain attached to their original nerve cells, even after freezing (which does not, after all, homogenize our brains). And even more than *that*, we know that to recover our memories we need not recover every single connection. We have some room for error.

This latter point becomes especially important because of another fact: *successful methods of dealing with these combinatorial problems are generally heuristic*. In practical terms it means that it's much easier to get a solution *close* to the correct one than to try to actually find the single correct

solution. The Travelling Salesman Problem provides a good example: there are methods to map out a route using only about 10^{10} operations. Your route can't be guaranteed to be the best, but it will be quite close.

On the negative side, it should be clear that we cannot expect to recover anything close to the original connections if every synapse is identical. How do we measure "close" when we do not, by definition of the problem, have the original wiring diagram at hand? Just as we need more knowledge to answer questions such as the number of separated synapses in frozen tissue, we need more knowledge to work out, even if only approximately, just what synapses match which neuron.

And of course, if we can find a way to avoid *any* separation of synapses, we'll find ourselves with a total and complete win, even if we still can't revive any patients. For after all, if memory works as neuroscientists now suggest, than we could then preserve memory ... and the ultimate success of cryonics will have been proven. Vitrification comes to mind first, but we can say similar things of any method to *reduce* separation

of synapses. (Incidentally, this also provides a scientifically based way to measure the *goodness* of suspension methods: count the number of separated synapses.)

The lesson of these numbers is *not* that revival is hopeless. I have written this article because I have grown more and more worried that too many cryonicists, on the basis of papers such as Ralph Merkle's, have decided that the ultimate problem of revival is *easy*, and most especially that it does not require us to know much more neurobiology than we already know. That is false, not just utterly false but overwhelmingly so—by factors of 10^{102} . And moreover, right now many cryonicists seem involved in a major *internal* battle: they fight over trivia, while the lifeboat which serves all of us is leaking. With vitrification, we might even stop that leak ... but the battle continues.

The Job's Not Over... (from page 7)

must completely re-examine Alcor's legal paperwork. The last time we did this was in 1991 when about 25% of the text underwent revision, and the structure of the documents was completely reorganized.

We are about ready to begin another revision, although this will be much less extensive. As an example, we have already changed the Authorization of Anatomical Donation to clarify the relationship between Alcor and the member for the medical and health authorities with whom we often deal. In the past some authorities have failed to understand that the Anatomical Donation gave Alcor preeminence over the relatives in control of the patient's body. We were forced to get relative's authorizations to obtain cremation permits (for the non-suspended portion of a neuropatient) and release of the patient's medical records. The new form specifically gives Alcor status of "next-of-kin" with the specific authority to obtain medical records and to authorize cremation.

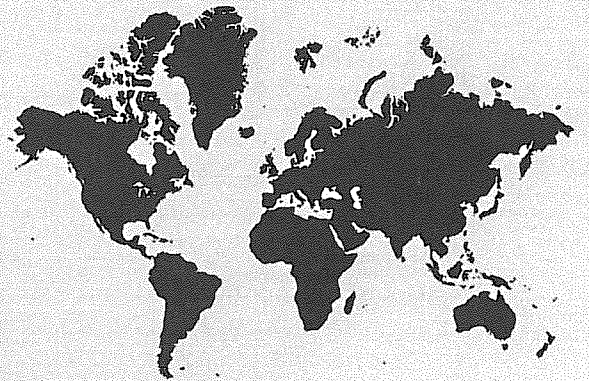
Another form we have revised and will continue to work on is the "Certificate of Religious Belief." No, this doesn't call cryonics a religion. But it does allow you to use your particular religious beliefs (and you do not have to specify any particular religion) to avoid autopsy, except in cases

of suspected homicide or contagious illness. This law exists in at least California, New York, and New Jersey. We will have forms available specifically for residents of those states, and we encourage you to look in your own state laws for "religious objection to autopsy" statutes.

If you are of a legal and detailed bent and wish to assist with any of these legal projects or review, please let us know. I hope soon to write about the many useful laws which have helped cryonics in California and Arizona so you can look for these laws in your state as well. Attorney and Alcor Member Jackson Zinn is beginning work on a cryonics legal handbook which would detail all of those laws in each state. Your local input would be valuable.

Membership Status

Alcor has 340 Suspension Members, 600 Associate Members (includes 99 in the process of becoming Suspension Members), and 27 patients in suspension. These numbers are broken down by country below.



Country	Members			Country	Members		
	Members	Applicants	Subscribers		Members	Applicants	Subscribers
Andorra	0	0	1	Ireland	0	1	2
Argentina	1	0	1	Italy	0	2	1
Austria	1	0	1	Japan	2	0	2
Australia	12	2	6	Lithuania	0	0	2
Brazil	0	0	1	New Zealand	0	0	1
Canada	9	4	45	Russia	0	0	5
Costa Rica	0	0	1	Spain	6	0	0
Denmark	0	0	1	Sri Lanka	0	0	1
Estonia	0	0	1	Sweden	0	0	1
Finland	0	0	2	Switzerland	0	0	1
France	0	0	2	U.K.	13	5	7
Germany	1	1	1	U.S.A.	292	97	357
Holland	0	0	2	Ukraine	0	0	1
				TOTALS	340	99	501

ORDER FORM

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

CRYONICS, 1 Year (4-issue) Subscription

United States.....\$ 15

Canada/Mexico.....\$ 15

Outside North America.....\$ 20

Cryonics back issues on disk/fiche (circle).....\$120

Catalog of back issues, 10+ years.....\$ 5

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

United States.....\$ 20

All Other Countries.....\$ 25

MEMBERSHIP

Alcor Member Application Package.....\$150

BOOKS

Cryonics: Reaching For Tomorrow.....\$ 7.95

Engines of Creation.....\$10.95

The Prospect of Immortality.....\$11.00

The 120-Year Diet.....\$ 5.95

Man Into Superman.....\$14.00

Immortality: Physically, Scientifically, Now.....\$ 6.95

The Silicon Man.....\$19.95

Articles and Reprints

CRYOBIOLOGY AND THE FEASIBILITY OF CRYONICS

The Molecular Repair of the Brain, *by Ralph Merkle, Ph.D.*.....\$3.00

Will Cryonics Work? Examining the Probabilities, *by Steve Harris, M.D.*.....\$2.50

Why Cryonics Probably Will Work, *by R. Michael Perry, Ph.D.*.....\$1.00

Freezing of Living Cells, Mechanisms and Implications, *by Peter Mazur, Ph.D.*.....\$2.50

"Cryobiology and the Feasibility of Cryonics Package" (All 4 of the above articles).....\$7.50

NANOTECHNOLOGY

There's Plenty of Room at the Bottom, *by Richard P. Feynman, Ph.D.*.....\$1.50

Molecular Technology and Cell Repair Machines, *by K. Eric Drexler, Ph.D.*.....\$2.00

Nanotechnology, *by Brian Wowk*.....\$2.50

Cell Repair Technology, *by Brian Wowk*.....\$2.50

"Nanotechnology Package" (All 4 of the above articles).....\$7.00

MEMORY, IDENTITY, AND THE BRAIN

Questions (and a Few Answers) About Memory, *by Thomas Donaldson, Ph.D.*.....\$2.00

Isn't That You Behind Those Foster Grants? *by David Krieger*.....\$1.50

But What Will the Neighbors Think?! The History and Rationale of Neurosuspension, *by Mike Darwin*.....\$2.00

SUSPENSION REPORTS

Her Blues Eyes Will Sparkle, *by Linda Chamberlain*.....\$2.00

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

ALCOR LEGAL HISTORY

Our Finest Hours: Notes on the Dora Kent Crisis, *by R. Michael Perry, Ph.D.*.....\$2.50

Motion for Award of Attorneys' Fees, *by David Epstein*.....\$2.50

Dick Jones Story, *Edited by Stephen Bridge*.....\$5.00

GENERAL

Lovecraft, Scientific Horror, Alienation, and Cryonics, *by Steve Harris, M.D.*.....\$2.00

Cryonics in Popular Culture, *by Steve Neal*.....\$1.00

"Why We Are Cryonicists" and "Alcor: The Origin of Our Name".....Free

Why Cryonics Can Work (brochure).....\$0.75

Cryonics and Christianity (brochure).....\$0.75

Discount Package (All of the above Articles and Reprints).....\$35.00

The literature above can be ordered by mailing in this form with a check or money order or credit card authorization (Visa/MC), or by telephone (Visa/MC only) by calling Alcor: 1-602-922-9013 or by FAX: 1-602-922-9027.

SUBTOTAL: _____
+20% if overseas

NAME _____ PHONE _____

TOTAL: _____

ADDRESS _____ CITY _____ STATE _____ ZIP _____

VISA/MC# (Circle one) _____ EXP _____

SIGNATURE (Credit card orders only) _____

Send your order to:
Alcor Foundation
7895 E. Acoma Dr., #110
Scottsdale, AZ 85260-6916

About the Alcor Foundation

The Alcor Foundation is a non-profit tax-exempt scientific and educational organization dedicated to advancing the science of cryonics and promoting it as a rational option. Alcor currently cares for 28 patients in cryonic suspension, and has hundreds of signed up Members. Being an Alcor Member means knowing that—should the worst happen—Alcor's Emergency Response Team is ready to respond for you, 24 hours a day and 365 days a year.

Alcor's Emergency Response capability includes equipment and trained technicians in Arizona, New York, Indiana, Northern California, Southern California, and England, and a cool-down and perfusion facility in Florida.

Alcor's Arizona facility includes a full-time staff with employees present 24 hours a day. The facility also has a fully equipped research laboratory, an ambulance for local response, an operating room, and a patient care facility using state-of-the-art storage vessels.

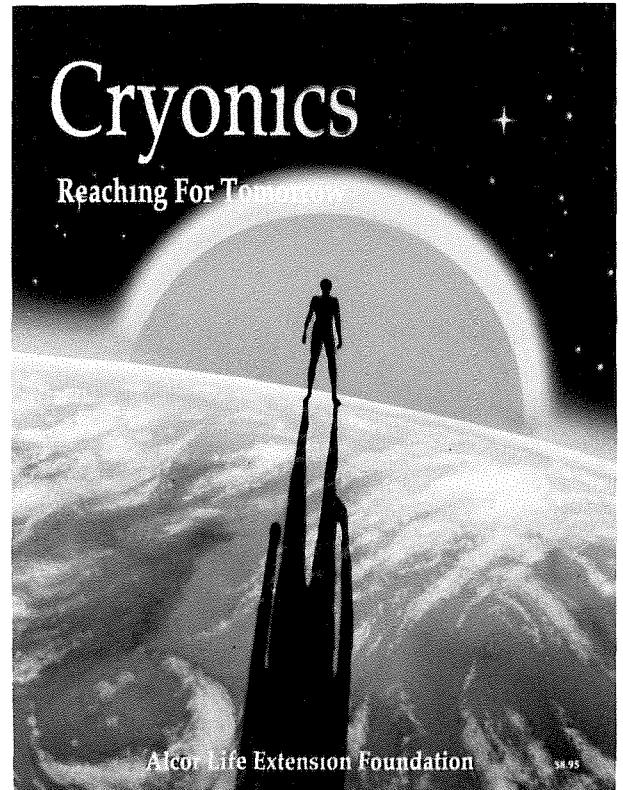
New Handbook Now Available!

The new edition of *Cryonics: Reaching For Tomorrow* is back from the presses! *Reaching For Tomorrow* is the "textbook" introduction to cryonics. Over 100 pages long, *Reaching For Tomorrow* is a fantastic and unique examination of the social, practical, and scientific arguments that support the continuing refinement of today's imperfect cryonic suspension techniques, in pursuit of perfected suspended animation.

This edition features a new Appendix based on the "Suspension Pricing and the Cost of Patient Care" article by Ralph Whelan in the October, 1993 issue of CRYONICS, as well as a considerably lengthened and updated chapter on "Revival."

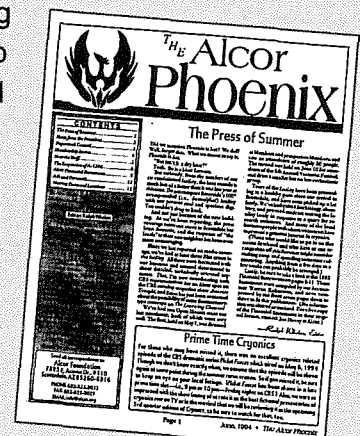
Order your copy for \$7.95, or receive it FREE when you subscribe to CRYONICS magazine for the first time. (See the offer on the inside front cover.)

Still the only comprehensive introduction to cryonics procedures and philosophy on the planet!



For those considering Alcor Membership. . .

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



"What is Cryonics?"

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

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

Subscribe to CRYONICS Magazine!

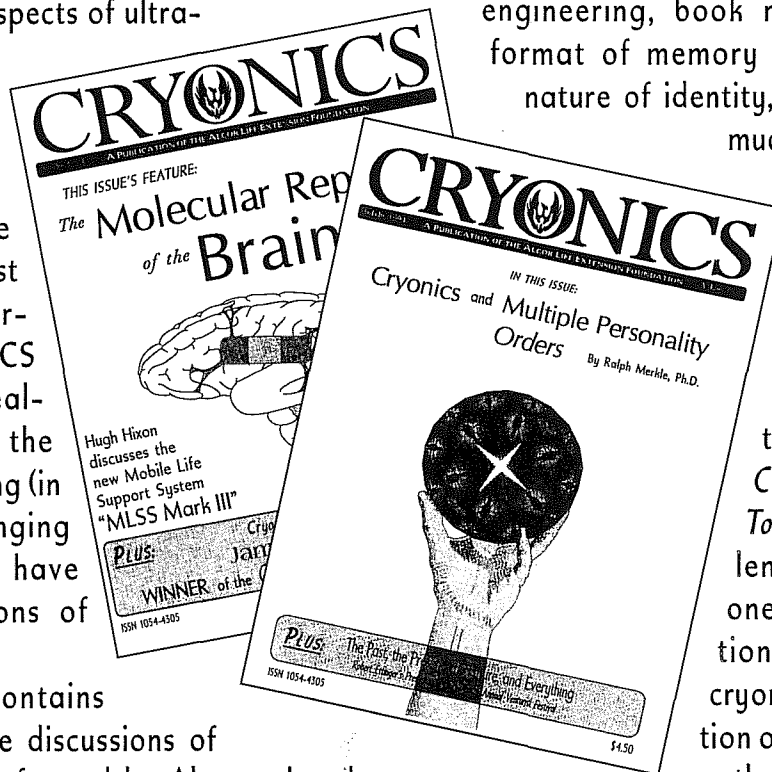
CRYONICS magazine explores the practical, scientific, and social aspects of ultra-low temperature preservation of humans.

As the quarterly publication of the Alcor Foundation—the world's largest and most advanced cryonics organization—CRYONICS takes a realistic, real-world approach to the challenge of maintaining (in a biologically unchanging state) patients who have reached the limitations of modern medicine.

CRYONICS contains thoughtful, provocative discussions of cryonic suspensions performed by Alcor, related

research, nanotechnology and molecular engineering, book reviews, the physical format of memory and personality, the nature of identity, cryonics history, and much more.

If you're a first-time subscriber, you can get a full year of CRYONICS for \$15 (\$20 if you're overseas), and we'll throw in a free copy of *Cryonics: Reaching For Tomorrow*, Alcor's book-length (100+ pages!) one-of-a-kind introduction to the science of cryonics. (See the description of *Reaching For Tomorrow* on the back inside cover.)



To place an order, call Alcor at 602-922-9013 with your VISA/MC, or send your check or m.o. to:
ALCOR FOUNDATION • 7895 E. ACOMA DR., #110 • SCOTTSDALE, AZ 85260-6916
See the back inside cover for more information about the Alcor Foundation and Alcor Membership.