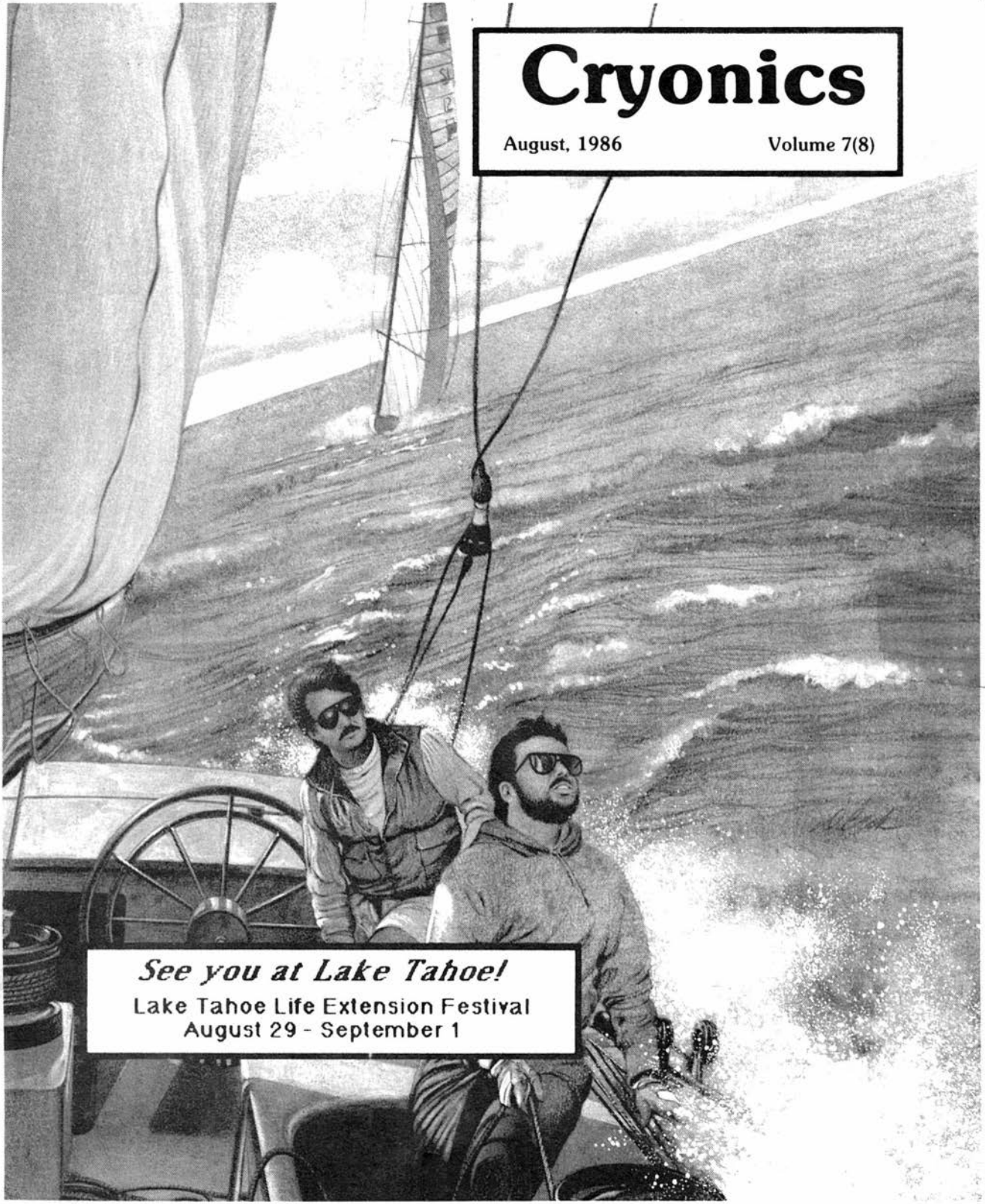
Cryonics

August, 1986 Volume 7(8)



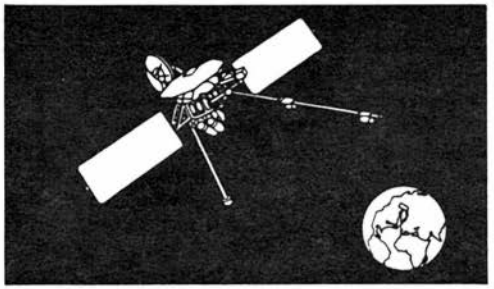
See you at Lake Tahoe!

Lake Tahoe Life Extension Festival
August 29 - September 1

Volume 7(8) August, 1986 Issue #73

CRYONICS is the newsletter of the ALCOR Life Extension Foundation, Inc. Mike Darwin (Federowicz) and Hugh Hixon, Editors. Published monthly. Individual subscriptions: $20.00 per year in the U.S.; $30.00 per year in Canada and Mexico; $35.00 per year all others. Group rates available upon request. Please address all editorial correspondence to ALCOR, 4030 N. Palm St., #304, Fullerton, CA 92635 or phone (714) 738-5569. The price of back issues is $2.00 each in the U.S., Canada, and Mexico, and $2.50 for all others.

EDITORIAL MATTERS



Beginning this month, we are going to run a number of pieces on the social aspects of cryonics, pieces which will explore areas such as philosophy, semantics and humor--and their relationship to the more effective spread of cryonics. To start off this series of articles this issue of CRYONICS has an upbeat feature by Dave Pizer, exploring...well, Dave has his own unique approach.

Dave's piece is a little (maybe a lot) ribald, and it may offend some of the sensitivities of our more staid readers. Nevertheless, it **is** a change of pace, and an informal survey of a few local readers argued two to one for its inclusion. So, if you're easily offended skip over it, and all should be advised that the Attorney General has determined that Dave's effort is hazardous to your moral health.

ENGINES OF CREATION

We have nearly sold out of our first order of 100 copies of **ENGINES OF CREATION.** We are going to proceed very cautiously in ordering another hundred since at some point we are going to largely "saturate" our market--and we simply cannot afford to tie up nearly $1,000 in inventory. If you are thinking of ordering copies of the book you should place your order promptly. This will benefit you in several ways: 1) It will encourage us to reorder if sales look steady or increasing, 2) You will get a book, which hopefully you will enjoy and profit from, and 3) You will get a book from us at a good price, which if we go out of stock and don't buy more, you will not be able to get for less anywhere else.

We have been following **ENGINES'** progress closely. We have queried Doubleday several times and have determined that the book is doing reasonably well. It has exceeded sales projections by about 15% and is selling more strongly in the general market (Walden's and Dalton's) than they expected. If it continues to do this well far enough into the future, there will very likely be a trade paperback edition available (retail about $9.00, through us for Suspension Members, perhaps as low as $5.00).

The book has been favorably reviewed by **Kirkus Reviews** (which has a big name

but which no one in the know pays any attention to) and, more importantly, by **BOOKLIST MAGAZINE** which is used by librarians across the U.S. and Canada to determine whether or not to purchase a book for their collection. **BOOKLIST** gave the book high marks and this will probably influence many librarians to purchase the book for their collections.

The MacMillan Book Clubs have also picked up **ENGINES** and are offering it to their members. The current MacMillan Natural Science Book Club flyer contained an excellent synopsis/review of the book which is far, far better than any of the almost nonexistent promotional material we've seen from Doubleday. One of the nice things about the MacMillan and **BOOKLIST** reviews was that **the reviewers actually had read the book, and what's more, understood it!** The **Kirkus Reviews** article made almost no sense at all and it was apparent that the reviewer had (charitable interpretation) not read the book or (uncharitable interpretation) had read it and wasn't bright enough to make any sense out of it.

We have already had several cold information requests resulting from the book.

SYMBEX PROPERTY GROUP FORMS

As anyone who's read CRYONICS for any length of time knows, ALCOR has had a policy of keeping its membership and readers informed about all aspects of its operations, and cryonics in general, whether it be good news or bad news. We think it's important to do that for a whole host of reasons, not the least of which is that we want your trust and confidence.

It has thus been especially frustrating that we've been unable to share with you the events of the last two years relating to procurement of a new home for ALCOR. At long last, the veil of silence can be lifted and we can freely discuss what's gone right about that endeavor, as well as what's gone wrong.

Some Background and History

About two years ago it became apparent to the leadership of ALCOR that we **had** to have a place of our own. That meant a physical plant which we owned and controlled so that we were not beholden to any landlord and not encumbered by the numerous restrictions we now suffer (mostly in regard to housing animals). It was also apparent that liability insurance was increasingly going to become a difficult issue, and besides, we were simply out of space--crowded to the rafters with equipment and supplies which we have no room for.

So, plans were undertaken for construction of a 6,200 square foot facility in the Perris Valley area. One of our members purchased 10 acres of beautiful and reasonably remote land, an architect was retained, a building was designed, permits were obtained, and the site was in its initial stages of preparation. This building was to be constructed by a consortium of several individuals and

SYMBEX PROPERTY GROUP

(A California Limited Partnership)

then leased to ALCOR. At the 11th hour this project had to be scrapped. Why?

In retrospect, looking back over the year and half of effort that went into it, we can say that a whole host of errors were made—and we have a share of the responsibility, or blame if you like, in making them. In good measure those errors stemmed from political elements beyond our control (totally excusable) ignorance (which is excusable), overconfidence (less excusable) and plain unwillingness to face facts (which is inexcusable). The story is a blackly humorous one, and cannot be related in detail here. But suffice it to say that we had no idea what we were getting into--and our best efforts to find out really didn't help much.

As usual, meddlesome government was at the root of a lot of the problems. We had to pay substantial amounts of money for an archeological survey (to rule out Indian burial grounds) an ecological survey and environmental impact study (there are kangaroo rats living on the property) and suffer through a requirement for a 30,000 gallon water tower (at a cost of about a dollar per gallon of capacity!), a $20,000 flood plain assessment (for a piece of property near the top of a hill, yet!), and about $20,000 of additional, unplanned costs; all courtesy of City Hall. As an aside, we ended up having to set aside about 50% of the property as a kangaroo rat preserve (no, we're not kidding!). By the time we were through with planning and approval, a $250,000 project had swelled to $350,000--perhaps even upwards of $500,000! Of course there were numerous sidetracks, frustrations, and detours along the way which time, space, and sheer disgust will not permit us to relate in detail here.

Despite these problems, the Perris facility might have been built had the liability insurance crisis not hit when it did. If we had another year or two to carefully and leisurely raise money and iron out details, we might have made it. But, for now at least, it is not to be.

That's the bad news. Now for the good news. As possible eviction confronted us, it was necessary to regroup and to do so quickly and effectively. A Limited Partnership was put together with Mike (Darwin) Federowicz as the General Partner for the purpose of acquiring a new home for ALCOR. This

Partnership was called the Symbex Property Group by Mike. **Symbex** is short for **symbiosis exemplified.** The purpose of Symbex was to act as a symbiotic partner to ALCOR and to the investors who would participate. Mike selected the hippopotamus and the small parasite-eating bird(s) that ride on its back as the logo for Symbex. The hippopotamus is normally a placid, plant-eating animal but can be a fierce, clever, and an unremitting adversary if its life or its offspring's lives are threatened. Mike saw the hippopotamus as ALCOR and the parasite eating birds as the Partnership Group--it's their job to keep the parasites and problems (liability insurance, landlords, and so on) off ALCOR's back.

Why Symbex Was Formed

Symbex was formed to acquire a building for ALCOR for a number of reasons, the major of which are summarized below:

1) The storage of patients and the conduct of animal experimentation expose ALCOR to the very real potential for public criticism and adverse reaction from neighboring tenants. In the past there have been several complaints from tenants in the industrial complex where ALCOR currently leases space. The potential for eviction and/or serious and costly disputes with the landlord is high.

2) ALCOR is severely restricted by the lease agreement as to the kind of animal research we can conduct. This is now seriously interfering with core ALCOR objectives for research and training.

3) The burden of providing a facility for both research and patient care programs (i.e., paying the $850 per month rent plus utilities) has unfairly fallen personally on ALCOR Director and Cryovita President Jerry Leaf for nearly nine years. Owing to changing personal circumstances, Jerry will be unable to continue this burden unsupported much longer. It was thus imperative that ALCOR seek an alternative to this situation which is consistent with its limited cash flow and overall cash poor situation.

4) Due to a national crisis in liability insurance, ALCOR and Cryovita have been unable to obtain the $500,000 of liability coverage required by our current landlord. ALCOR and Cryovita thus face the possibility of eviction for noncompliance with the lease.

5) Current rental rates for industrial property suitable for use by ALCOR, coupled with ALCOR's modest cash flow, have prevented acquisition of adequate space to conduct the kind of research and patient care operations necessary to allow for progress or even provide

for safe working conditions at the current level of operation.

6) Serious problems in the promotion and growth of ALCOR are occurring as a result of the absence of an owned facility. A key element in the successful operation and long term stability of any cryonics organization is a public perception of the organization as such. The current situation with ALCOR being operated out of a leased industrial bay, with the many potentials for complication and harm outlined above, coupled with a clear crisis in the form of the unavailability of liability insurance in a leased facility, is profoundly affecting the confidence of both the public and the current membership of ALCOR.

A partnership was formed to handle purchase of the property rather than having ALCOR do it directly for the following reasons:

1) Liability containment. By having an organization other than ALCOR hold title to the property, it is far less vulnerable to attack if there is litigation aimed at ALCOR.

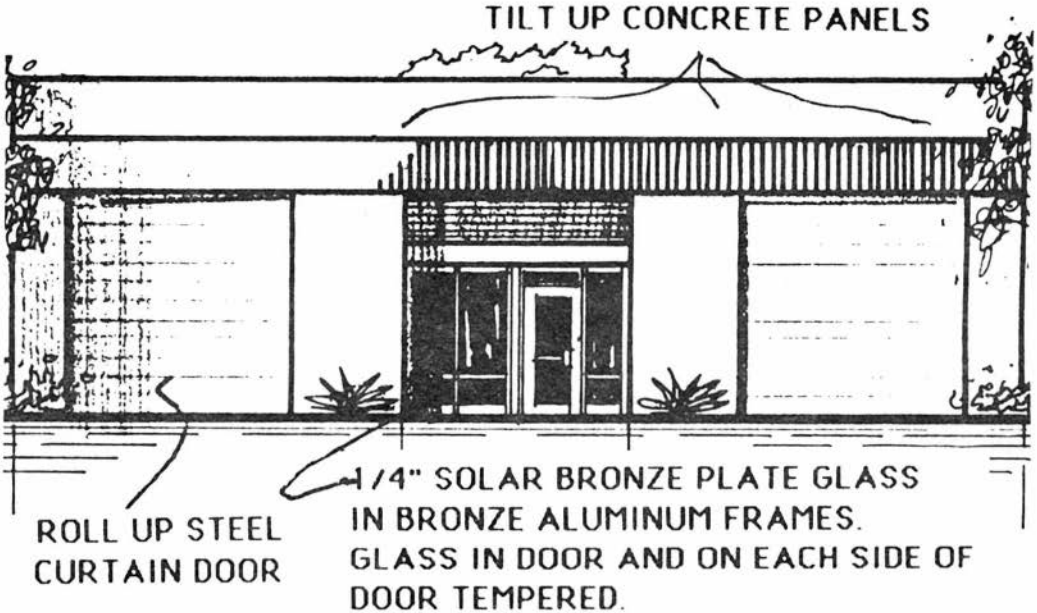
2) Fairness. By allowing people to retain an investment interest based on what they actually contribute, a far more fair and equitable situation is created. People who contribute should be allowed, wherever possible, to accrue personal benefits from their commitments.

3) Potential Tax Advantages. Purchase of real property via a partnership sometimes carries with it tax advantages which may provide an incentive to invest which would not normally be there otherwise.

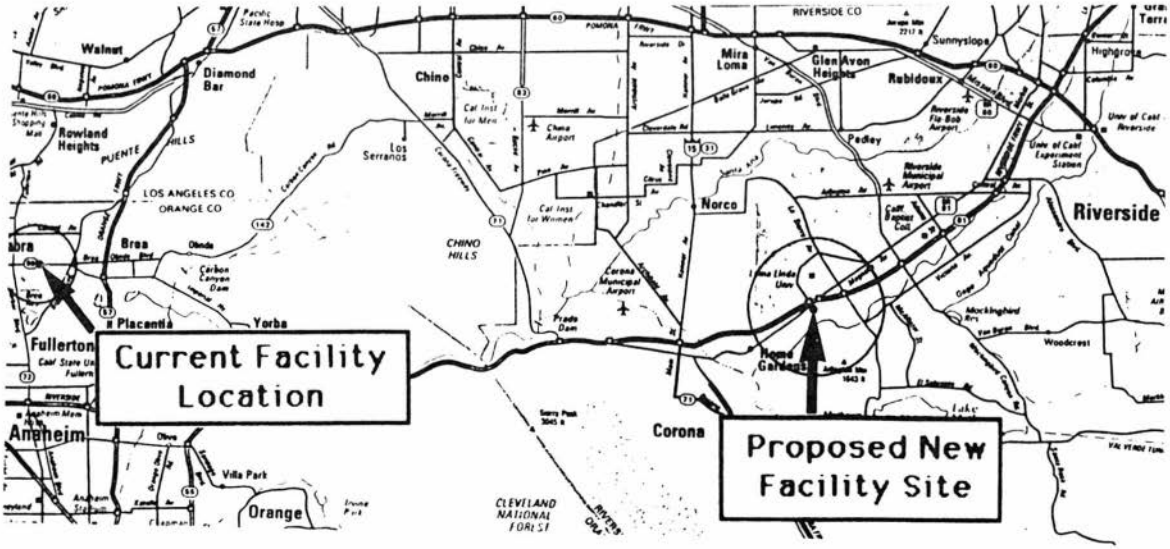
Mike began working on site selection with Reg Thatcher, the real estate agent (and former ALCOR Suspension Team member) who nine years ago found Cryovita and ALCOR's current rented quarters for us. Reg was also responsible for helping to select the Perris property, and prior to that selection had been searching for industrial property suitable for ALCOR and Cryovita to occupy. The resumption of the search did not offer a lot of hope. Even the most delapidated, worn-out industrial buildings in the worst neighborhoods of the barrio and in the worst earthquake risk areas were going for $100,000 or more! Several months of searching failed to offer even a reasonable possibility. But one thing was clear: **we were not going to settle for moving into some slum area with 9 earthquake risk** (a 9 risk means complete loss of the structure and probable ground failure as well!).

Selection of the Building

Two years previously, Reg had happened upon some nice, new, free-standing industrial buildings which had just been put up near Riverside Airport. The price on these buildings was very competitive and they had been quickly snapped up. Reg recontacted the developer on the off chance that he might have another project completed or far enough along to represent a possibility. It turned out he did. This developer has a good reputation for quality work and attention to detail. He also seemed to have two other good things going for him: a string of satisfied customers (he'd put up quite a number of similar small free standing buildings in the past) and a reputation for honesty.



The developer was in the final planning stages of a nine building industrial park in the city of Riverside, California. A trip out to the site disclosed a good piece of land with a superb location: two minutes off the 91 Freeway in a very pleasant and well kept industrial neighborhood (i.e., clean, modern tilt-up construction industrial parks like the one we occupy now). The overall character of the area was superb. No crowding, wide open spaces, plenty of low cost, high quality (well kept) manufactured homes available, lots of attractive shopping and retail outlets nearby—in short a near perfect location.

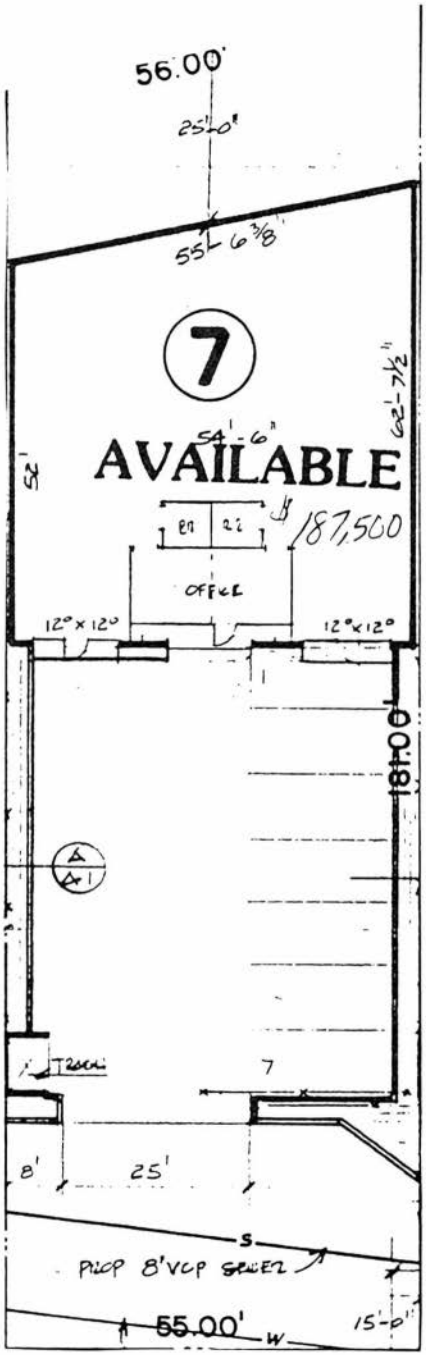


Best of all, the earthquake risk for the area of the site was between 7 and 8 (more on that later) with no ground water in the area and plenty of granite outcroppings in the neighborhood (decomposed granite soil or DG for short, is about the most earthquake resistant soil around).

The developer had a 3,200 square foot building available on a 9661 square foot lot for $187,500. A bargain by Southern California standards where even a **modest** single family house on almost no lot goes for $130,000 or more! After some negotiation for custom features (floor drains, wiring, subdivisions and so on) a deal was struck. It then became a matter of raising the required money. This was not an easy job. Because of the peculiar nature of the tenant (at least peculiar to bank loan officers) it was virtually impossible to get a loan. Sooo, that meant Symbex would have to come up with the equivalent of the first trust deed as a down payment **in cash.** That meant raising $150,000 plus closing and other costs. A staggering task! Mike had from April 4th to June 20th to do just that--a little over two months!

And there was an additional handicap: Due to SEC regulations there could be no public disclosure of the Offering of Symbex units or any discussion of the potential purchase or of the formation of Symbex with the ALCOR membership via CRYONICS or any other public media. Offerings could be made only to selected people who met certain criteria. Thus, the "blanket of silence" surrounding our efforts to acquire a facility.

SITE:	
Lot Area:	9661 sq. ft.
Building Area:	32.3% coverage
Landscape	18.6% coverage
BUILDING:	
M-1 Area	1754 sq. ft.
Warehouse	1070 sq. ft.
Office	300 sq. ft.
TOTAL	3124 sq. ft.
PAVED PARKING:	
M-1	5 Stalls
Warehouse	1 Stall
Office	1 Stall
TOTAL	7 Stalls



Despite these handicaps, the job got done. And it got done in a way that has startled and surprized everyone involved. **Symbex succeeded in raising $154,000 in cash and $37,500 in loan pledges from 29 committed ALCOR members.** Lest anyone think that one or two people "towed the line" or contributed most of the capital--think again. The maximum amount of money that any one person invested was $25,000 and the minimum was $1,000. The average purchase of shares amounted to $5,310. What this means is that support for Symbex and the purchase of an owned Southern California facility was incredibly broad-based. And further (and most encouraging) it did not have to include participation from financially exhausted ALCOR stalwarts like Jerry Leaf, Hugh Hixon, and most of the other ALCOR Directors. (Nor are we shy or the least bit apologetic in pointing this out—these people have given and given and given--they deserve, richly deserve, to have others take up some of the load!)

Progress

The pictures and drawings which accompany this article document what the building will be like in its rough finished state, as well as current progress with construction. So far we are very pleased with construction progress and with the quality of the work. We are particularly pleased with the soil engineering studies which were conducted before and after grading and site preparation. Our soil compaction is 98%, which is almost as good as DG and which should provide outstanding earthquake resistance! We now feel reasonably confident our earthquake risk is probably in the 7 range (light structural damage: cracked plaster, toppled chimneys, cracked glass).

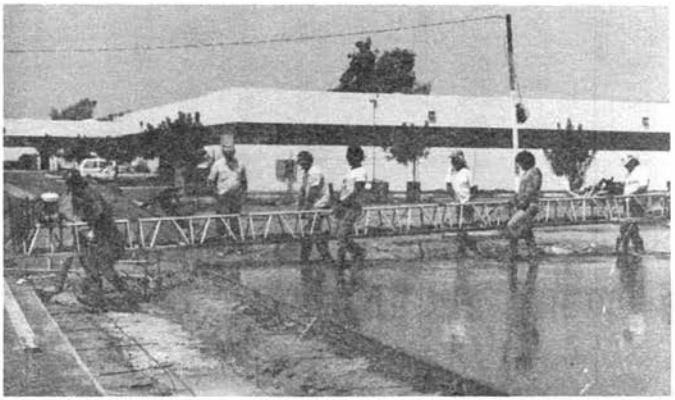
The building will be of a tilt-up, steel reinforced, concrete slab type construction. This kind of building is known for its earthquake resistance and this building has been engineered specifically to provide good earthquake safety. We are very, very pleased with the work on the foundation and with the overall quality of the work so far. We are out at the site every other day or so to examine progress and check workmanship.

It is currently the intent of Symbex to execute a 20 year lease with ALCOR which will contain substantial safeguards for ALCOR and make the property available at a price ALCOR can afford. While most of the major hurdles are out of the way, several significant small ones remain.

ALCOR badly needs help in terms of money and labor to subdivide space in the new building. We need an operating room and bunk room for personnel with desperate urgency. If you think you can help, contact us ASAP!

So, that's the story. We're sorry we couldn't tell you sooner, but our attorneys tell us that would have been a violation of Securities law. It would have been tantamount to advertising the sale of Symbex units in the state's eyes. We hope you're as excited about the prospect of our new home as we are, and we hope you'll continue your support and help. We should be moving into the new quarters sometime around the end of August or the beginning of September, so let us know if you can lend us a hand, 'cause we're gonna need it!

Cement truck delivers concrete ahead of the leveling machine as the second half of the slab is poured. Workmen move in behind the leveler to level and finish the concrete. 26 June, 1986



Men at work. The concrete gang picks up the leveler to move it to the next slab. 26 June

Layout of the wall forms begins on the completed slab of another building 30 June, 1986

TBW SUCCESS

After three frustrating failures in a row, we have had a success with Total Body Washout #12. The animal was a "backtrack" control to check our technique and to try to isolate the problem. We think we've done so. Apparently a bizarre and unlikely interaction between our respirator and our new solid state electrocautery was causing "stepping" overventilation of the animal's lungs. Our hat is off to team member Carlos Mondragon who noticed the weird behavior of the respirator during the last experiment. A quick check of the records confirmed that no animal had survived since the arrival of the new cautery. To get around this problem we simply manually ventilated the animal by squeezing an Ambu bag during the parts of the procedure that we felt were critical. A total of about six hours! A special thanks to the stalwarts who "bagged" him for so long.

TBW-12 did fairly well, but experienced a couple minor complications which we have not seen before--we'll know more what to make of them when we get the histology work-up done. This animal, a biter with an unpredictable disposition, was sacrificed for a thorough postmortem exam and a light microscopy workup six days after the experiment.

Hopefully we've isolated the problem and we can get the program back on track and begin pursuing some exciting research possibilities which have been too long deferred.

TBW #12 four days after the experiment. The "Elizabethan collar" prevents him from licking his wounds and infecting them. The playpen is Mike Darwin's idea, and makes postoperative care a lot simplier.

LAKE TAHOE FESTIVAL

The Lake Tahoe Life Extension Festival is fast approaching and we want to be sure to remind our readers who plan on attending to **make your motel/hotel reservations now.** If you haven't done so already, do so immediately! The Festival will take place Labor Day Weekend and it is going to be booked up solid in no time. There are a number of inexpensive motels in the area (including a **Motel 6**) and information on them may be had by calling the toll free number of the Tahoe Visitor's Information Bureau ((800) 822-5922). Often the Bureau can directly connect with the motel you're interested in.

The lineup for this year's festival is as follows:

SATURDAY, AUGUST 30, 1986

MORNING SESSION

8:30 **Registration**

9:00 **Opening Remarks**

9:15 **WARD DEAN, M.D.**
"Biological Aging Measurement: A New Concept in Clinical Medicine". Ward Dean, Medical Director of the Center for Bio-Gerontology in Los Angeles, California, will discuss the importance of aging measurement for life-extension and age-retarding programs. He will show how these measurements are done in his center and discuss the results of his work.

10:00 **BREAK**

10:30 **THOMAS DONALDSON**
"Does the Soul Survive After Death?". Thomas Donaldson, who authors articles frequently in most life extension periodicals, will describe the current state of neurology regarding memory storage and what is known about biochemistry and other aspects of memory survival after death, Alzheimer's disease, brain damage, freezing, etc.

11:15 **RICHARD MARSH, Ph.D**
"The Killer Word". Richard Marsh, Professor Emeritus at San Francisco State University, and Member of the Board of Governors for the American Cryonics Society, will explore the ways in which language, perhaps humankind's most useful tool, may also be its greatest danger.

11:45 **DAVID PIZER**
"Venturism: A New Religion for Cryonicists". David Pizer, founder of Venturism in Phoenix, Arizona, will give a brief overview of the advantages of having a church for those involved in cryonics.

12:00 **LUNCH INTERMISSION**

SATURDAY, AUGUST 30, 1986

AFTERNOON SESSION

2:00 **GREGORY FAHY, Ph.D.**
"Cryobiological Tutorial". Greg Fahy, who is with the American Red Cross in Bethesda, Maryland, will illustrate

several basic principles which will help the non-technical attendees understand the freezing process and give them a better basis for appreciating the other presentations on this subject. Questions from the audience during the presentation are encouraged.

3:00 **JERRY D. LEAF**
"Current Developments in Suspension Transport and Perfusion Techniques". Jerry leaf, who is the President of Cryovita Laboratories, Vice President of the ALCOR Life Extension Foundation, and a Research Associate at UCLA Medical Center, will discuss refinements in techniques and equipment for suspension. Patient transport and cryoprotective perfusion will be discussed, including transport pharmaceuticals, new ECMO transport unit, left ventricular venting, pulsed arterial flow equipment, and constant volume and closed circuit cryoprotective perfusion.

4:00 **BREAK**

4:30 **HAL STERNBERG**
"Intervention in Age-related Immune Dysfunction". Hal Sternberg, who is a Research Scientist at the University of California at Berkeley, will discuss the dramatic decline in immune function with aging. Several approaches have been taken toward the retardation of immunological senescence and these approaches and their relevance to us will be discussed.

5:00 **DINNER INTERMISSION**

EVENING SESSION

8:00 **BANQUET** (Same location as the presentations).

9:00 PANEL DISCUSSION OF THE PROS AND CONS OF TWO MODES OF CRYONIC PRESERVATION: NEUROPRESERVATION AND WHOLE BODY, AND FUTURE REPAIR PROCESSES FOR SUSPENDEES. Panelists: Thomas Donaldson (Chairman), Mike Darwin, Jerry Leaf, and John Day.

SUNDAY, AUGUST 31, 1986

MORNING SESSION

9:00 **MIKE PERRY, Ph.D.**
"Life Extension Predisposition: Some Findings and Commentary". Mike Perry, who is a computer science specialist at Boulder, Colorado, and Editor of the Abiolysis Macroscope, will compare the attitudes of life extensionists toward death vs. the attitudes toward death held by a more general segment of the population. Some commentary will be offered on the scarcity of life extensionists and on prospects for remedying this problem.

9:45 **PAUL SEGALL, Ph.D.**
"New Directions in the Life Extension Sciences". Paul Segall, who is an Assistant Research Physiologist at the University of California at Berkeley, and Director of Research for Trans Time, Inc., will address the emergence of a rodent-canine-primate model in cryonics, as well as analytic neurohistochemical and 2-D-computerized electrophoretic techniques in the service of interventive gerontology.

10:45 **BREAK**

11:15 **HAROLD WAITZ, Ph.D.**
"Progress in Mammalian Suspended Animation". Harold Waitz, Director of Research for Biophysical Research and Development in Berkeley, California will discuss the role of the rodent, canine, and primate models in cryonic research.

12:00 **LUNCH INTERMISSION**

AFTERNOON SESSION

2:00 **GREGORY FAHY, Ph.D.**
"Recent Work on Vitrification". Greg Fahy will have pictures of a new computer-controlled organ perfusion system and the results of its use. He will also discuss new cryoprotective agents and a new rapid heating system.

3:00 **MIKE DARWIN**
"An Introduction to Alcor". Mike Darwin, President of the Alcor Life Extension Foundation in Fullerton, California will present an overview of Alcor's research, suspension, and public education programs.

3:20 **"Histological Evaluation of Postmortem Deterioration".** Mike Darwin will discuss the rate of degradation of biological structure after varying periods of warm ischemia. This is the first approach to quantifying loss of biological information after "death".

3:40 **"Alcor Canine Total Body Washout Project: An Update".** Mike Darwin will present an update of the most recent experiments on dogs designed to develop perfusates to be used in humans.

4:00 **BREAK**

4:30 **SAUL KENT**
"New Developments in Life Extension". Saul Kent, President of the Life Extension Foundation in Florida, will be speaking about some of the exciting recent advances which have been taking place in life extension and an update on the progress of Project 2000.

5:00 **Closing Remarks**

For information on registration for the festival, please use the flyer in the center section, or call Fred and Linda Chamberlain at: (916) 542-1329.

Please, make your hotel reservations and conference reservations today!

We'll see you there!

Updating the Emergency Response System

One of the aspects of our Emergency Response System (ERS) that we've been historically least happy with is our member identification system. Originally we used the Medic-Alert Foundation's bracelets, but there were numerous problems with them. Their response time in processing orders was horrible—sometimes it took as long as three months to get a bracelet and they were unwilling to engrave the bracelets as we wished—insisting on including their phone number as well as ours. After numerous logistic and administrative hassles with them, we switched to a local company which has been more responsive to our needs.

Unfortunately, the tag blanks available from our current supplier were originally designed for use by school children and are simply too small to allow for a very sophisticated message, and they are not as easily identifiable as **medical information tags** as we would like. For several years now we've been casting about for a new supplier of tags who can reliably, affordably supply us with tags that are durable, aesthetically pleasing, easily identifiable as an emergency medical tag, and which allow for more engraving space.

We believe we have identified such a supplier and we are in the early stages of evaluating the performance and reliability of this company. So far, things look good.

However, we are still not very satisfied with the current message on the tags:

WHOLE BODY DONOR
RESUSCITATE - COOL
NO AUTOPSY/EMBALM
CALL NOW COLLECT
714 738-5569 A-0000

Several of our members have brought up at least three possible problems with this message:

1) "WHOLE BODY DONOR" could be misinterpreted to mean that the person is willing to donate organs and tissues for transplantation. Not a good thing. Hopefully the hospital would **call** the number on the tag, but people are often incredibly stupid and you never know...

2) "NO AUTOPSY/EMBALM" might be interpreted to mean **don't autopsy** the patient but **do embalm him!** Again, not a very nice contingency to contemplate.

3) There is no reward offered--many of our members feel that offering a cash reward of anywhere from a few hundred to $1000 is essential to getting a response (see discussion below).

The new bracelets and neck tags we are currently planning to use will be far more easily recognizable, and they are about 60% larger than the existing tags. They will allow for two and half times as much text, since the tags can be engraved on both front and back. This should allow us to add some additional information and to perhaps have a line dedicated to important personal medical information such as: DIABETIC, HEART DISEASE, or ALLERGIC TO PENICILLIN.

Proposed new ALCOR ID tag. (Shown 1.5 times actual size)

In addition to new tags, we are strongly considering offering a laminated wallet card (available from the same company) which will contain a microfiche of an 8-1/2" by 11" page containing additional instructions and personal medical information.

We frankly confess to not knowing where to go with respect to the general bracelet message. Should we be more specific or less specific? Should we keep the tag message brief and simply refer emergency medical personnel to the wallet card? These are tough questions and we don't pretend to know the best answer.

What we've decided to do is to solicit **your input** so that we have a wider range of possibilities to choose from. We've decided to hold a contest for the best tag message. First prize will be a free set of tags (neck and bracelet) and a quarter's dues free if you're a Suspension Member. If you are an Associate Member the prize is a copy of ENGINES OF CREATION, and two year's free subscription to CRYONICS (one year if an overseas subscriber). Not a bad haul! Judging will be by the ALCOR Board (whose members will not be eligible to participate).

Picking a good tag message is not a simple thing (Believe us, we've been struggling with it and no matter what we come up with, somebody isn't happy and

usually for good reason.) and it will require the exercise of subtlety and skill. To be successful you first have to pick a psychological strategy. Do you want to offer a reward? Do you want to give them a lot of information, or just get them to call ALCOR and let the ERS tech handle it? Do you want to hook them by using a message such as "**RESEARCH ANATOMICAL DONOR....** Settling upon a strategy will be critical to success. There are probably strategies we haven't thought of. You may, if you like, accompany your entry with a short explanation of your strategy and the reason for the message.

In the center of the magazine you'll find an entry blank which contains the spacing set-up available on the bracelet. You may enter more than once, and you may suggest alternates as part of a single entry. For instance, you might offer a standard message and then an option for those who wish to use it, such as offering a reward or the inclusion of personal medical information.

A word of warning about rewards: rewards are not routinely included on tags now, because we require a deposit from you in the amount of your reward **in advance.** The reason for this is that someone might respond in an emergency on your behalf--and you then recover rather than deanimate. We feel morally, if not legally responsible for honoring such a reward and we must have the means to do so. Clearly, if you recover, **we're not going to get your life insurance benefit** so that leaves us holding the bag.

The message must, of course, include our phone number, and the member's six space ID#, as well as instructions to call collect.

The deadline for the contest will be September 1st, and anyone is welcome to enter. Just fill out the form in the center of the magazine, put a stamp on it and drop it in the mail to us.

Good Luck!

ALCOR LENDING LIBRARY

The ALCOR archives have now matured to the point where we can begin to offer some material to our Suspension Members and Supporting Members (if you've contributed $200 or more to us in the last year you're automatically counted as a Supporting Member). Some of the materials that will be available on a loan basis are quite hard to find anywhere else, and we have only a few "working copies" ourselves.

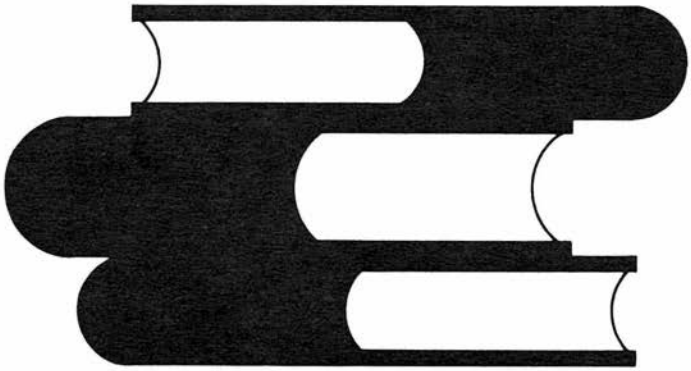
The rules are really quite simple, and you need be only a Suspension or a Supporting member to participate. Materials will be available by mail only, and will require a written or telephone request accompanied by a deposit (which is refunded when the item(s) are returned in good condition) and a small handling fee to cover postage and mailers.

Listed below are the items which we currently have available for loan:

BASIC PRINCIPLES OF OBJECTIVISM Lecture series by Nathaniel Brandon. this is a 20-part cassette tape lecture series which examines Ayn Rand's philosophy of Objectivism. Objectivist philosophy has been crucial in shaping many aspects of ALCOR. This lecture series was prepared and recorded in the early 1960's and has several shortcomings, but we still feel it a worthwhile introduction to a powerful and useful philosophy.

We have only one working copy of BASIC PRINCIPLES so it may take awhile to honor your requests on this. These tapes must be requested in sequence and can be borrowed for only one week at a time. There will be a fine of 50 cents per day for late returns on this item. The postage and handling charge is $2.00. A $5.00 deposit is required (which we can hold until you complete the series, if you so choose).

THE PROSPECT OF IMMORTALITY by Robert C.W. Ettinger. Long out of print, we have several of the hardcover editions available for loan. Ettinger's book was the one which launched the cryonics movement. It was originally commercially published by Doubleday in 1964. THE PROSPECT is available for loan periods of two weeks. Late charge is 25 cents per day and the deposit required is $10.00. Handling charge is $2.00.

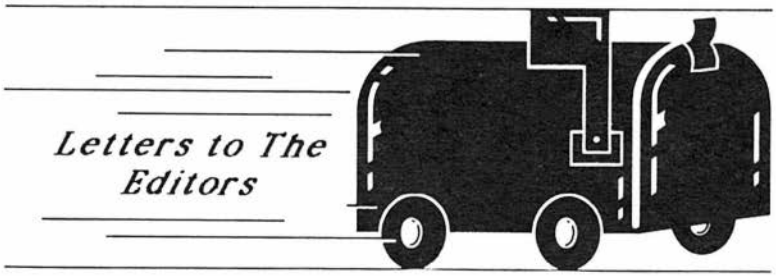


SUSPENDED ANIMATION by Robert Prehoda. A scarce and difficult book to find. Prehoda reviews the prospects for suspended animation from an early 1970's perspective. From a technical standpoint the book is badly dated today, but it includes some vituperative and interesting chapters on cryonics, and is a "must read" by any serious student of the history of the cryonics movement. SUSPENDED ANIMATION is available on a two week loan, late charge is 25 cents per day and deposit is $20.00. Handling charge is $2.00

CRYONICS REPORTS The newsletter of the Cryonics Society of New York, volumes I, II and III. This is a fascinating glimpse into the early history of cryonics. Each volume may only be requested individually. The late charge is 25 cents per day and the deposit required is $5.00. Handling charge is $2.00.

If there is anyone out there who has a complete set of the Life Extension Society newsletter FREEZE-WAIT-REANIMATE we would love to get our hands on it long enough to make a master photocopy and have some copies produced and bound. Perhaps someone in the Michigan Group has a complete or nearly complete set. We'd be happy to prepare a master for you too or to otherwise share in production costs! We'd like to see multiple copies of this archival material available and out there in people's hands. The same is true for THE IMMORTALIST. Some time ago we tried to get a complete set from the Cryonics Association, but never quite got it. Does anyone else out there have a complete or nearly complete set of THE OUTLOOK/THE IMMORTALIST?

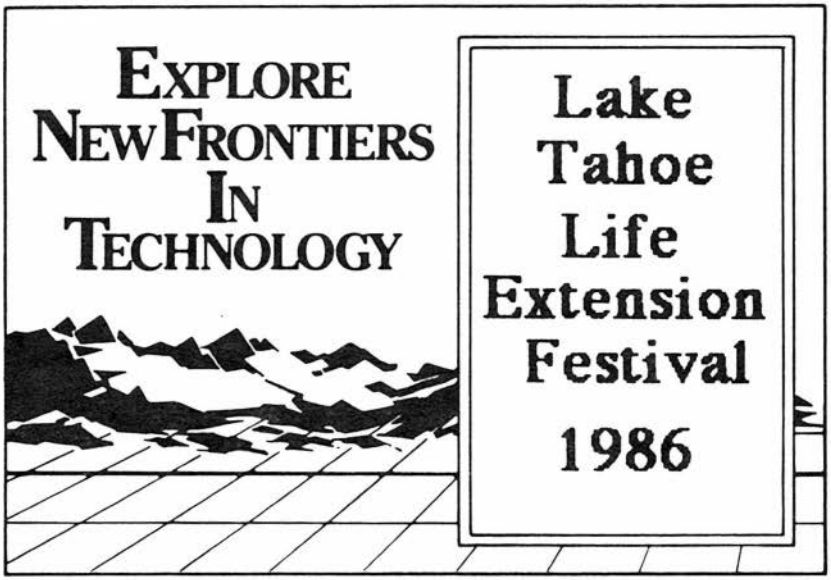
Depending upon the degree of interest (and hassle) generated by this program, we hope to offer more materials in the future. Your suggestions would be welcomed.



To the Editors:

So. Donaldson once attended a science fiction convention, and from that convention he generalizes about all fandom? Science fiction conventions are not all the same, you know. In fact, they specialize somewhat in what sort of fan attends. Some are just glorified costume parties. Some are places of serious debates.

Is science fiction hostile to cryonics? My first exposure to the idea was Heinlein's **The Door Into Summer.** Not exactly a hostile book. Poul Anderson's **World Without Stars** was my first exposure to the idea of immortality, as something that might be hoped for in my life. It wasn't until SF had "infected" me with the cryonics "meme" that I found such works as **The Immortalist** and **The Prospect of Immortality.** Found them because of a search triggered by SF.



August 30th - September 1st

PRELIMINARY AGENDA
1 9 8 6

We call this agenda preliminary, because plans made this far in advance are always at risk of being changed as we get closer to the date of the Festival and find problems with obtaining commitments from the vendors. We will make sure that all registrants receive complete information about any changes, and will try to see that all changes are also published in Cryonics magazine.

As many of you know, we planned a cruise on the Tahoe Queen last year, only to be informed at the last moment that our paid reservations were being cancelled! Many attendees at last year's Festival told us that they missed the opportunity to enjoy being on the Lake, so we want to be sure to include this kind of activity this year. Since the Queen is a very nice experience, we're going to give her management one more chance this year to have the honor of carrying Life Extensionists aboard their paddle wheel cruise boat. I hope we have better luck this year!

We have received requests from many of last year's attendees for a more relaxed pace at the Festival to give attendees coming from all over the country more time for informal interaction and discussion. Toward this end, the 1986 Festival will have fewer speakers (to allow more time for questions after each presentation) and breaks between speakers. The only pre-planned activities will be the reception on Friday evening, the technical presentations during the day on Saturday and Sunday, the banquet on Saturday evening, and the afternoon cruise on the Tahoe Queen on Labor Day (Monday). Sunday evening will be open for activities of individual choice or for just congregating with fellow immortalists.

Unless pre-registration is too large to be accommodated at the Timbercove, we will be holding the Festival at the same location again this year. We strongly recommend you pre-register as early as possible. We were near capacity last year and don't want to have people come hundred of miles to find out there just isn't any way to seat them. If we're going to have to move to a different location for more room, we need to find this out as early as possible! Also, and this is very important, **as the Festival is being held on one of Tahoe's busiest holiday weekends, it would be wise to make your lodging reservations well in advance.** If we can be of any assistance with your advance planning please give us a call (see Registration Form).

REGISTRATION FORM

Name: _____

Address: _____

City: _____

State: _____ Zip: _____

Phone (_____) _____

Number of Persons Attending: _____

Lodging and recreation brochures will be mailed to registered attendees.

I/We plan to attend the following days:

☐ Saturday (8-30-86) ☐ Sunday (8-31-86) ☐ Monday (9-1-86)

ENCLOSED IS $_____ ($40.00 X no. of attendees) for my/our Early Registration Fee(s) including banquet on 8-30-86. Registration after 8-1-86 will be $50.00 per attendee.
Banquet preference: ____Vegetarian ____Chicken ____Beef

ENCLOSED IS $_____ ($9.00 X no of attendees) for the afternoon Emerald Bay cruise on board the Tahoe Queen on 9-1-86. It is understood that this must be received by 8-1-86.

$_____ TOTAL ENCLOSED

** Make checks payable to: LAKE TAHOE LIFE EXTENSION FESTIVAL **

If you have any questions, contact Fred or Linda Chamberlain at (916) 542-1329 days or (916) 577-4746 evenings, or write them at P. O. Box 18698, South Lake Tahoe, CA 95706. Mail Registration Forms to this address.

Lately there have been other books, such as **Neuromancer**, **Knight Moves** (The alien sells us a scientific development relating to power generation, and a human pours the profits into life extension research), and most recently, **Marooned in Real Time** (ran in April - July 1986 **Analog** - Eds.). Read that last one, and read its afterword. Vernor Vinge apologizes for the unrealistically slow progress portrayed. In his own words, "Sorry, I just needed civilization to last long enough to hang a plot on it." He also predicts that you and I will be around for quite some time, barring a catastrophic war.

I really think this is the key to the absence of realistic technological progress, particularly in biology, in SF. A realistic extrapolation of technology comes to the conclusion that it won't be long before we are doing things (Even being things...) which are beyond our present understanding. Even the best SF writer has a hard time writing salable fiction about people who stand as far above us as we do above, say, field mice. I wouldn't be at all surprised if most SF writers hold expectations not too much different from our own.

Don't take one convention as the measure of a culture. Attend a couple more. Arrange with the con committee to put cryonics on the schedule as a panel. Just don't expect the more likely prospects to be walking about with flashing lights on them, at what is after all, a large party.

Brett Paul Bellmore
Capac, MI

To the Editors:

In the June issue of CRYONICS the editors state "In the seven years we've been putting out CRYONICS we have never had a topic excite more interest, commentary, or excitement than the issue of a 'Cryonics religion', or cryonics as religion." In the May issue of the IMMORTALIST, a writer says "It is possible to believe in the teachings of Jesus and in cryonics/immortality. Our movement must put more resources into this effort."

I find all of this quite interesting. I was a Unitarian minister for 13 years. Twice during my career as a Unitarian minister, I sought to proclaim the gospel (that's Greek for Good News) of immortalism from the pulpit. The first time, in 1970, was six months after I began my first pastorate, in Los Angeles. I used as my text Alan Harrington's **The Immortalist.** The response was so disappointing and negative that I never mentioned immortalism or cryonics again, in that church.

Seven years later, when I moved on to my second pastorate in the San Francisco Bay area, I continued to hide my immortalist views. I was a closet immortalist. I remained in the closet until 1979, when I had a religious experience. This religious experience incidentally did not occur while wandering in the desert or meditating on a mountain. It occurred while I was making love to my wife. I was suddenly overwhelmed with the realization that my "ultimate concern" was immortalism ("ultimate concern" is perhaps the best and certainly the most concise definition of religion). I could no longer, in good conscience, remain in the closet. I decided to leave the Unitarian ministry.

It was my wife who suggested another alternative. She urged me to try to integrate my commitment to immortalism into my ministry. Although she has never shared my immortalist views she has been willing to help me find ways to

effectively express mine.

So, reluctantly and with great fear and trembling (and I'm not being facetious), I set out again to spread the good news of immortalism and cryonics to the liberal freethinking intellectual Unitarians. Two years later I was invited to resign my pulpit. The only reason stated was my advocacy of life extension. I felt bad, and I felt good. I had tried, "fought the good fight", stood up for what I believed. With my wife's support, I soon found a new career with many more psychic and financial rewards.

In theory, Unitarians should have been in the forefront of the life extension revolution. Unitarianism is not a Christian religion and historically can be distinguished from virtually all other religious movements by its reliance on reason and scientific method as the ultimate source of truth. Also, Unitarians were, historically, committed to the idea of progress.

Just as in theory, traditional Christian churches should be in the forefront of cryonics. After all, Christianity is founded upon an act of reanimation, and a belief in literal, physical immortality is the fundamental tenet.

Unfortunately, theory sometimes doesn't work out the way it's supposed to. Few adherents of either liberal Unitarianism or more traditional Christianity have any interest in cryonics or scientific immortalism. And few cryonicists or immortalists seem to have any interest in religion, liberal or traditional (at least until recently). This might be because organized cryonics possesses already most of the major characteristics of a religion.

First, cryonics is based on faith. Cryonicists, like religionists, are convinced in the absence of definitive evidence, that they have a way to defeat or survive bodily death.

Second, cryonicists, like religionists, strive to promote good will and fellowship among their membership. Judging by the one meeting of a cryonics organization that I have attended, cryonicists are much more congenial and considerate of each other than is the case in many mainstream religious organizations. Indeed, the dedication of the new Trans Time facility which I attended and the meeting of the newly formed American Cryonics Association that followed was one of the most truly spiritually uplifting experiences I have ever had.

Third, and most importantly, organized cryonics shares with organized religion still another characteristic and that is factionalism. Both are marked by continuous, often divisive, debate between groups or factions over differences in strategy, methodology, and style, each claiming to represent the true faith. Common commitment is often obscured by the heat of argument.

About the only characteristic of a religion that organized cryonics does not have is a formalized ritual of liturgy.

Personally I am not convinced at this time, that there is any compelling reason why a formalized cryonics ritual or liturgy should be developed, although I would be interested in seeing any proposals that people who feel differently might bring forward.

What might be more valuable would be the development of an immortalist/cryonics theology -- a true liberation theology which would emphasize that all evil comes from the fact that we die, and which celebrates life and living as the most natural, most beautiful, and most spiritual of events, and which recognizes resistance to death, in all forms, as the ultimate struggle. Such a theology could accommodate the thoughts of Fyodorov, Also Buckminster Fuller, F.M. Esfandiary, Gerald Feinberg, etc., as well as Jesus, Moses, and the Buddha.

Peter H. Christiansen
Pittsburg, CA

INTERVIEW WITH JERRY LEAF

PART II

CRYONICS Magazine: I'd like to change subjects for a little while and discuss your "professional work". You work in the Thoracic Surgery Research laboratory of UCLA Medical Center with Dr. Gerald Buckberg. A number of fascinating papers and research results have been flowing out of that laboratory in the past few years--much of it of direct relevance to cryonics. Can you tell us a little about your work there?

Jerry Leaf: Sure. I've been at UCLA for 15 years now. I was originally attracted to the Thoracic Surgery Division because I realized that the techniques of perfusion using extracorporeal circuits and artificial oxygenators to support patients in deep hypothermia was exactly the kind of technology that would be required in doing suspended animation research and procedures.

I'm in the Department of Surgery, Division of Thoracic Surgery, attached to the UCLA School of Medicine. My primary responsibility is in the research laboratory. However, I've worked on the clinical open heart team in the Operating Rooms, and I'm a Board Eligible Cardiopulmonary Perfusionist. I've been through the ECMO (Extracorporeal Membrane Oxygenation) training program at the University of Michigan as well. The research has required me to acquire competence in thoracic surgery techniques. I'm involved in training neophyte thoracic surgeons in the laboratory environment as well as participating in research. My expertise in low temperature biology has been useful, since most of the techniques for protecting the heart involve hypothermia. You could say that I've had something more than a graduate education in cardiac physiology. I've been functioning as a scientist and have been co-author of over 25 papers coming out of the UCLA laboratory. This is a distinction usually shared only with MD's and PhD's. I've also set up the entire aortic valve/conduit storage program at UCLA, which involves the cryogenic storage of human heart valves and arteries for transplantation into children. But let's go on to the research and its clinical applications.

Most of the research focus when I began work at UCLA was aimed at protecting the heart during operative procedures. At that time the heart was arrested so that surgery could be performed on it--it is almost impossible to carry out delicate surgical procedures on a heart when it is beating normally in the chest--by electrically fibrillating it and applying topical hypothermia (ice slush). One of the first discoveries that was made just previous to my coming there was that electrical fibrillation caused the heart to consume 300% more energy than it would use in the beating empty state--where the heart would be contracting but not pumping blood. Dr. Buckberg asked a fundamental question: "Why are patients going home after we correct what's wrong with the heart and they're coming back five years later in worse condition than when we got them and corrected the problems that they had at first?"

He began to try to answer these questions by doing basic physiology on the heart; what were the blood flow requirements, oxygen requirements? What did hypothermia do? What did then currently used methods of achieving cardiac standstill during surgery do to the heart long term?

Buckberg began to re-examine the technique of pharmacological arrest, a technique where you use potassium to depolarize the heart's nervous system so that the heart cannot contract. You can further reduce the ability of the muscle fibers to contract by using a low calcium perfusate, and that's one of the things that we looked at also. Ten years previously a surgeon named Melrose had thought that an obvious technique for stopping the heart would be to introduce potassium into the circulation of the heart and depolarize the neurons to inhibit contraction. This was a sound principal, except that he didn't determine how much potassium was needed--and he used such high doses of potassium that it caused fatalities. As a consequence of his suggestions employing such high doses of potassium, the technique was assumed to be inappropriate and was abandoned for ten years. Our laboratory, and a couple of others, reassessed this method, called pharmacological arrest, and determined that if the proper dosages are used, this technique is far more physiologic and results in far less injury to the heart than the electrical fibrillation and direct icing which had been widely used before. The pharmacological solutions used to arrest the heart are now called cardioplegic (heart paralysis) solutions.

A natural extension of this work was to try to optimize the cardioplegia solution—to make it as supportive and nondamaging as possible. We decided that the best vehicle to use for the potassium was blood itself--the body's own best perfusate. We systematically developed blood cardioplegia to stop the heart quickly, to maintain it hypothermically with no injury and then to provide it with metabolic substrate while in the hypothermic arrested state. Along the way we discovered the importance of maintaining an alkalotic pH during hypothermia, such as poikilotherm animals (turtles, frogs, and so on), do.

Recently our attention has been focused on providing adequate support for hearts that have been subjected to ischemia, to no blood flow as a result of atherosclerosis or heart attack. We began to look at patients who were coming into the emergency room who had completely occluded coronary arteries in which segments of the left ventricle, which does the real work of pumping blood to the body, were beginning to fail. We had already demonstrated that we were able to restart cardiac metabolism after periods of time which would have previously been considered hopeless.

CM: Why was this work undertaken? What was the reason you made this discovery about being able to "jump start" so called "dead" hearts?

JL: The reason that we looked at periods of normothermic ischemia was because there were always cases in the operating room where the patient would have an area of his heart that was so poorly perfused or not perfused at all because of infarct or narrowing of a coronary vessel, that when you gave your cardioplegia and arrested the heart, the cardioplegia solution couldn't reach the flow restricted area. So, that area was subjected to a total arrest of blood flow without being metabolically protected and without being cooled by the cardioplegia solution. Often it was 45 minutes or more before good flow to that area could be re-established with a graft. And those were the areas of the heart that needed protection and metabolic support the most! So, you'd have warm ischemia in those areas until you got the grafts in.

About this time the concept of reperfusion injury was coming to the fore. There was work by Denton Cooley at the Texas Heart Institute, and others, which indicated that the precipitation of calcium in the mitochondria in the cells was a key cause of damage when circulation to an ischemic area was restarted. This occurred because the cells were metabolically exhausted and unable to regulate their ionic content. The important realization here was that the actual injurious event came **after** the re-establishment of blood flow--it was an indirect, not a direct result of lack of oxygen and nutrients.

The natural question to ask was "What would happen if you gave the cells time to recover to the point where they could once again handle the reintroduction of normal ion levels?" We had, early on with our research with blood cardioplegia, found it necessary to develop techniques for controlling the level of calcium in the blood we were delivering to the heart--since in hypothermia the heart also cannot regulate its ionic milieu very well. We reduced the available ionic calcium level in the blood using citrate. Later on of course, we used calcium channel blocking agents in conjunction with that.

This was only the first and most obvious reperfusion injury. It was characterized as the **calcium paradox.** You need calcium for normal contraction of the muscle, but paradoxically if you reintroduce calcium before the cells are able to regulate its level, you kill the cells.

This began to raise other questions about reperfusion injury. If calcium is a problem are there other problems that can be addressed and solved? Since we had demonstrated that controlling ionic calcium could redefine myocardial death, at what point is the heart beyond recall? At what point should we give up trying to salvage a heart? We don't know.

CM: What are the clinical limits right now? How long after an infarct has occurred and the tissue has been deprived of flow is it possible to intervene and restore function?

JL: Actually measuring the blood flow in an area of the heart which has suffered an infarct is a difficult thing to do in a clinical situation. We have done it in the research lab in dogs. In a clinical situation, the advance of disease has usually been slow and the tissues have had time to compensate for it metabolically by the development of collateral flow. So, it's hard to directly compare the dog work with the human work. It's easy enough to measure blood flow through an occluded artery and find there isn't any, but it is far harder

to rule out the presence of collateral flow—flow from vessels feeding adjacent areas of the heart. When you have one area of the heart's blood supply cut off you can have such low pressure in that area of the heart that a trickle of blood from adjacent areas can continue to flow through the infarcted area.

CM: What is the limit in the laboratory using the dog model where complete absence of perfusion has been established?

JL: At the start of our work on regional ischemia in 1980, the accepted wisdom of the time was that after three hours of 100% occlusion of the coronary arteries, those areas served by those arteries would be 100% lost. Of course there were always areas that were at risk in the perimeter of the infarct that would eventually recover, because they weren't totally ischemic due to the presence of collateral circulation.

We began using our substrate-enhanced cardioplegia to perfuse these areas. We didn't, as you might first expect, perfuse these areas with cold blood cardioplegia, because we wanted to enhance the metabolic state of the cells; and in order to do this, we had to provide substrate at a temperature at which the cells would be able to actively use it. So we used warm blood cardioplegia which was substrate enhanced; containing amino acids such as aspartate and glutamate which we had previously shown as being effective in "sparking" metabolism and restoring the levels of important high energy compounds required for operation of the cells.

Using this approach we were actually able to get hearts back after six hours, which was twice what the common wisdom would have had you believe was possible. During this same period of time we looked at some of the markers of irreversible injury, such as ATP levels and vital staining (a marker of key enzyme levels inside the cells) and we found that none of them were adequate to predict irreversible injury. Whatever marker or barometer you want to use for irreversible injury, one thing you can be sure of is that if the cells are able to function, then they are not irreversibly dead! If the heart is able to pump blood and support the life of the organism, then it's not dead. Therefore, all of the so-called accepted indicators that we had looked at were inadequate to tell if there was a state of irreversible injury. We demonstrated that what were thought to be irreversible, end-stage levels of ATP were simply false. It was analogous to saying that because you only have a sixteenth of a tank full of gas that your engine won't run. What we found is that no matter how little gasoline you have in your tank, the engine will run as long as there is some gasoline present—providing the engine was still in working order.

What we found was that myocardial cells would function normally even if you had ATPs that were one-half of what was then felt to be the threshold of irreversible injury. Likewise, we found that vital staining techniques which rely upon the presence of myocardial enzymes (they do not stain the areas that have low levels of enzymes—supposedly indicating "cell death") were not really predictive of irreversibility. We found that the areas that were unstained using these vital dyes were actually capable of contracting and contributing to cardiac output—which is not possible if the tissue is dead!

We've looked at a range of other markers as well--high energy compound levels, a range of vital staining techniques, ultrasonic crystal evaluation of myocardial cell work performance, and electron microscopy (to evaluate structural changes after hours of ischemia). What we've found, working in

conjunction with Dr. Schostrand, who is the world's foremost expert on the ultrastructure of the mitochondrion, is a perfect correlation between the structural condition of the mitochondria and the functional state that the cells containing these mitochondria were able to achieve.

CM: So in other words, your basis for pronouncing a piece of tissue or a cell irreversibly injured has shifted from the rather indirect approaches represented by markers such as vital staining and ATP levels, to the much more direct criteria of structural changes?

JL: Our conception of myocardial death has evolved essentially to become perfectly analogous to the cryonics position on irreversible death. That is to say, if we look at the cells and there's nothing there—that is to say there is no structure present in a key area, such as the mitochondria, we find a high correlation of no function. On the other hand, if we find structure there, we find that the only reason it doesn't function is that we haven't learned how to make it function yet. The farther we go, the more we learn about how to make cells function which still have structure left! The only thing you have to have is structure. In other words, if the cells exist, if their components are reasonably intact, at this point we have to say that every time we do something else (so far) we are able to restore function. There is no identifiable cell with structure that we haven't been able to adequately reperfuse and recover to function at this point. Of course, we haven't looked at cells that have had no energy input into them beyond a certain point—in the dog model we've looked at ischemic episodes of up to 16 hours duration—which is twice what anyone else though was possible to achieve.

We've gone on to apply these principles to the treatment of patients in the clinic. We've gone far beyond what we have developed in the dog lab. We've done many patients who've had 12 hours of ischemia and we've done some patients who've had 24 hours of regional ischemia in the myocardium. Sure enough, if you reperfuse them exactly the same way as we reperfuse ischemic dog hearts, 6 days later the patients are going home with normally contracting left ventricles. If you compare those to patients who were in better condition to begin with who've been given the standard treatment of simply re-establishing blood flow to the affected areas using streptokinase (a clot dissolving enzyme) or balloon angioplasty (to dialate plaque clogged arteries) in which you get an adequate blood supply to the ischemic areas, those patients typically come into the catheritization lab **not** in cardiogenic shock and they typically leave the catheritization lab **in** cardiogenic shock! Which is to say that they are worse off than when they arrived—they have suffered reperfusion injury. So they've had injury added to insult and in following up these patients we've found that the infarcted areas of the myocardium scar over and suffer tremendous loss of tissue and consequently of function. That is, the structure was destroyed by inappropriate treatment, with a subsequent loss of function.

At this point in time the patients that the cardiologists are willing to hand over to us for our clinical trials are the patients who are in the worst shape. They are in cardiogenic shock and the cardiologists themselves are reluctant to try to treat them—since conventional approaches which simply revascularize the injured area will initially only worsen the patient's condition. This is something these critically ill patients cannot tolerate. Indeed, they have lost more than a few such patients in the catheritization lab using streptokinase and balloon angioplasty.

Thus the cardiologists have increasingly begun to turn over these patients to us for controlled reperfusion in the operating room. The groups of patients that we've compared using controlled reperfusion versus those who've simply been revascularized with streptokinase and balloon angioplasty have shown a striking contrast. The ones that we've done have all left the hospital with functioning ventricles. As a matter of fact they've all shown some degree of return of function immediately after treatment. If the patients are in cardiogenic shock, or are requiring extra support such as an intra-aortic balloon pump then by the end of the procedure they usually no longer need it. By contrast the patients who are inappropriately reperfused typically experience a reperfusion injury and go into cardiogenic shock and often have to be placed on intra-aortic balloon support. So my exposure to dealing with the so-called markers of irreversible death in the research laboratory at UCLA has only served to reaffirm my previous intentions and my previous beliefs that if we knew how to treat a patient who had been without adequate blood flow we could deal with this—in principle. In at least one organ, the heart, we have been able to deal effectively with reversing the injury due to both ischemia and reperfusion such that we have had to completely discard what were then accepted criteria for irreversible injury. I think this is a principle that may well be applied across the board to virtually every organ system in the human body.

CM: What research areas in cryonics do you feel need to be addressed in the next few years?

JL: Virtually every aspect of the procedure (laughter). We're like children standing the middle of the Hershey factory at lunch time. We've got all these goodies begging for our attention in virtually every direction that we look. It's very difficult to decide what to do first. We need to do everything. We need to do virtually everything that clinical medicine itself is beginning to look at. Namely, the causes of ischemic and cryoinjury and how to control them. How do we prevent real cellular death as represented by overwhelming loss of cell structure?

In order to address that issue I think you have to look at what you do when you put someone into cryonic suspension. It's a process that starts out at some point, you go through some definitive procedures, and you end up at liquid nitrogen temperature. Let's take a look at step one. What can be done at step one, transport of the patient? What can we do to improve the chances of that patient getting through transport with the least amount of injury? I think it's of critical importance that we mobilize all that we can from clinical medicine to minimize the amount of ischemic injury the patient gets. There is a definitely a time-related, quantitative change in the structural content of the cells--in the amount of damage done--versus temperature and the overall treatment of the patient. That's something we can measure and get a handle on. We know that the longer a patient is ischemic the worse the injury is going to be; from the work of others and from our own experience as well. We also know that simple reduction of the temperature will go a long way toward reducing the severity of the injury.

We need to improve our responsiveness and our ability to rapidly reduce the patient's temperature while providing circulatory and metabolic support. We need to improve our pharmacological intervention to further minimize ischemic damage.

CM: Those are certainly very practical things, but they are not exactly what we had in mind as far as pure research goals.

JL: What I'm saying is that we have to start at the beginning. We need to concentrate on protecting the brain from ischemic injury. This is a problem which needs a lot of attention in terms of research and improved capability.

I'm not saying that you can afford to ignore cryobiological research--which cryoprotective agent to use, what's the best concentration, how do we avoid cracking, and so on. We already know that no matter how good we get at cryoprotection or ischemia injury reduction, we've still got the terrible phenomenon of cracking of patients who are cooled to liquid nitrogen temperatures. As I said at the outset, there are lots of areas which urgently need attention and these areas all need attention and need it **now.**

I think it's very important to avoid the state of mind that people have typically had in cryonics in the past of being willing to accept any kind of injury as long as the tissue has been reduced to the solid state. That seems to have been the hallmark of success in cryonics in the past: if you get them frozen, nothing else matters. I think it's going to take more than this for cryonics to work. It's tremendously important to know that you are preserving cell structure rather than blindly proceeding and hoping that future medical and biological scientists will be able to straighten everything out. Where we have to start in accomplishing this is to do everything we know to do. If we start with the attitude: "Well, this doesn't matter, they'll figure out how to fix that tomorrow," then we've surrendered before we've started to fight.

Once we're doing everything we know to do, then we can start working on areas where we don't have any clear ideas of what we can do to improve preservation of structure.

CM: But certainly there's a cost vs. benefit ratio here. One wouldn't for instance want to apply a technique which would improve structural preservation by 1% but which would raise the cost of the procedure 1000%! How do you address that interplay between cost and quality?

JL: We don't have an adequate yardstick for making such an evaluation. In some areas we don't know what the hell the result will be. And that's a problem we've had all along. Of course, that's been a major focus of ALCOR and Cryovita's research. The work we've been doing on ultrastructural preservation, on structural changes during ischemia, and in frozen patients are critical in establishing this baseline. What we need to do is assess any changes in protocol that we make on the basis of improvements in structural preservation.

Once this correlation is established for a given procedure, it then becomes an economic and personal question, not a scientific one. Are people willing to pay for it? Do they want to pay 1000% more for a 1% improvement in structural integrity? At least we can tell them what we can do and what it is going to cost.

CM: How do you feel about offering a range of services in terms of quality? One of the reasons some people, such as many of the older CI members, have given as to why they are not signed up with ALCOR is that they can't afford the quality of the services offered—and perhaps don't feel the extra dollars spent return a sufficient dividend in terms of structural preservation.

JL: I think that the baseline that we have to measure other techniques against is the one that we're developing and currently assessing. If someone can't

afford the techniques we offer and the protocols we apply, then we are obligated, before we offer any other protocol, to quantify and qualify this in some way by doing the studies that will document just exactly what it is we're delivering. I can't allow myself ethically to be in a position of having someone who is not involved in clinical medicine, who is not involved in doing cryonic suspensions, who has no clear idea of what the impact of what they want done to them will be, to be telling me how to do cryonic suspensions. They're coming to me and asking me to do something for them which neither of us understands. They're just hoping that whatever is done will be adequate. I have to have some confidence that the procedure I'm employing will work or has a some reasonable chance of working. Everyone involved, both the patient and me, have to be **informed** about what's being done. Informed consent is a critical and important medical standard which should not be tossed aside.

CM: So what you're in effect saying is that a clear understanding of any proposed lower-cost protocol has to be had, or at least as clear an understanding as is present for existing protocols, and this understanding must be translated into a set of caveats or an informed consent document of some kind?

JL: Absolutely. For example, it may be possible to preserve a patient's life by amputating his leg if he has a crushing injury, or it may be possible to save his life and the limb by doing a very complicated and costly vascular surgery procedure on his leg. One patient may say "I don't have the money and I can't get it, so I'll have to go with the amputation because I want to live." It's very difficult for us to be that definitive in developing protocols to preserve structure. I think we will eventually get to the point where we'll be able to look at structure and say "This is probably adequate structure to allow for a reasonable chance at recovery of function."

They're asking for decisions based on criteria and evidence which are not yet developed. That's part of the immediate research goals that need to be developed. What is the necessary degree of structural integrity which can reasonably be envisioned to allow for restoration of function? What are the minimum protocols required to achieve that degree of structural preservation?

Our existing transport procedures are aimed at preventing ischemic injury by providing adequate circulation. If ischemic injury has already occurred, what can be done to reverse this injury or limit its effects before perfusion with cryoprotective agents? Our transport pharmacological protocol is an attempt to affect ischemic injury.

An area that begs to be studied is how our cryoprotective perfusion protocols affect cellular structure in terms of reperfusion injury to patients who have been exposed to ischemic injury. Cryoprotectant toxicity and its effects on structure is another area. We already know that freezing, with storage at LN_2 temperatures, causes fracturing. We have to develop methods of low temperature storage that will avoid fracturing, which may mean higher storage temperatures for frozen tissues. The most compelling concept in cryobiology in recent years is vitrification, which avoids freezing, but requires higher storage temperatures. Whatever direction our research goes, structural preservation of cells and tissues will be our "gold standard" in the near term.

END OF PART 2

Omlette, Prince Of Burbank

A tragical comedy adapted and abridged by Dave Pizer with our profoundest apologies to the Bard

Characters

Clyde, King of Burbank.
Omelette, son to the late King and nephew to the present King.
Poncho, Lord Chamberlain.
O'Horneya, Daughter of Poncho.
Horace, friend of Omelette.
Larry, son of Poncho.
Curly, courtier.
Moe, courtier.
Frank, a soldier.
Beanie, a soldier.
Fartinbra, Prince of Hollywood.
Gerty, Queen of Burbank, mother of Omelette.

Act I

Omelette, Prince of Burbank, is summoned from his studies at UCLA to the Royal Burbank Court by the news of his father's death. His sorrow is deepened by his mother's hasty marriage to his uncle, the crafty Clyde, who has seized the throne and is attempting to prevent Fartinbra from invading Burbank and recovering the title of, "Movie Capital of the World," lost when Johnny Carson moved to Burbank.

Scene: Two soldiers on guard at the castle

Beanie: Who's there?

Frank: Nay, answer me. Stand and reveal yourself.

Beanie: Long live the King!

Frank: Beanie?

Beanie: Si.

Frank: What's neweth tonight?

Beanie: I thinketh I've seen a ghost floating around.

Enter Horace.

Horace: What art thouest dudes up to tonight?

Beanie and Frank: We thinkist we seeneth a ghost.

Horace: Have thouests been snorting any white powder?

Beanie and Frank: No man, this is for realeth.

Enter the ghost.

Horace: Wow man, he looketh's like the old King, I wonder if the old King was a cryonicist?

Exit the ghost.

Enter Omelette.

Omelette: What's happingeth dudes?

Beanie, Frank and Horace: We seeneth a ghost.

Omelette: Havest you dudes been snortesting white powder?

Beanie, Frank and Horace: No, man.

Enter the ghost again.

Ghost: Followeth me Omelette, I have some words for you in private.

The two go off together.

Omelette: This is far enough Ghost, what doeth thou want?

Ghost: I am thy father's spirit. Pity me not, but lend me thy serious hearing. I need you to avengeth my death. Then I will be able to finally fade away to nothingness so I can be completely dead forever.

Omelette: Blockhead, why didn't you have yourself frozen?

Ghost: It was truly bad judgement. I didn't want to spendith the money. I thoughtest I could take it withest me. Man was I a jerkest. In any case, now I've found out that before I can melt into nothingness, my death must be avengedest. Will you handle it for me?

Omelette: Sure, giveth me the details.

Ghost: King Clyde had me poisonedeth and then married my wife and assumed my throne. He was pissedeth because I was considering having cryonics become a wayeth of life here in our Kingdom. He is really anti-cryonics.

Omelette: I'll see what I can do.

Act II

Omelette feigns insanity as a screen and makes the over-confident Lord Poncho believe he is mad because his lustful daughter, O'Horneya has repulsed his advances. King Clyde is not fully convinced, however, and sets Curly and Moe to spy on Omelette to learn the truth. Omelette plans to expose the king, however, by having a company of strolling players present a murder/play containing episodes which resemble the actual killing of his father. In the meantime the King has accepted a promise from General Fartinbra not to invade Burbank but has granted him permission to march through the city for an invasion of Encino.

Scene: O'Horneya and her father, Lord Poncho.

O'Horneya: Dad, Omelette has gone mad.

Poncho: How do you know?

O'Horneya: I offered to perform his favorite goody and he saideth he was not in the moodest.

Poncho: Boy, with your reputation for performing that act, he must be mad.

Enter King Clyde.

Clyde: You guys hearested the latest on Omelette, he's gone mad.

Poncho: Boy, I'll say.

Clyde: I'll have Curly and Moe check it out.

Enter Queen Gerty.
Gerty: Have you guys heard the latest about Omelette?

All: Yes!

Act III

Curly and Moe having failed to discover the true cause of Omelette's distraction, King Clyde sends them all back to UCLA. Omelette sneaks away and returns to instigate a murder/play for the royal audience. The presentation of the murder/play upsets King Clyde and gets him thinking about death. He goes to a local cryonics organization to see about maybe purchasing a cryonics arrangement in case of his own passing. The cryonics salesman puts a ten day binder on the King to cover him, while the King thinks it over. Omelette wants to kill King Clyde, but he wants to wait until the binder runs out, so the King will have no chance to live forever.

Omelette meanwhile, goes in to see his mother to bawl her out for marrying Clyde so soon after the death of Omelette's father and while there, accidentally kills Poncho, who was hiding behind the curtain spying.

Scene: Queen Gerty's dressing room.

Omelette: Mother, why didith thou marry Clyde so soon after the death of my father?

Gerty: I was pregnant. Clyde and I had been foolingeth aroundeth.

Omelette: Oh, that explains it. Hey what's that noise behind the curtain?
I'll stick my sword in the curtain. Oops, I've accidentally killed Poncho.

Scene: Later after everyone settles down from the accident, Omelette goes off to ponder death. He is contemplating being frozen himself.

Omelette: To be frozen, or not to be frozen,
that is the question.
Whether tis' nobler in the mind,
to suffer the slings and arrows of bad public opinion,
and to go for it,
and maybe live forever.
Or? Hmmmmmmm?
The proper thing is to die a normal death.
To please my friends and society.

To be normal.
Or?
Na, only a blockhead would not be frozen.
Am I a Prince or Blockhead?
Prince!
I don't want to die!

Enter O'Horneya.

O'Horneya: Omelette, we are aloneth, let's get it oneth.

She removes her blouse.

O'Horneya: Look at these big babies, aren't they magnificent?

Omelette: I'm sorry you luscious, lusty lass, I'm not in the mood.

O'Horneya drops her drawers.

O'Horneya: OK, then how about this, just take a gander at this?

Omelette: (yawning) I'm sorry you warm, wanton, woman, I'm not in the mood.

O'Horneya: But, I'm so hoteth, someone must satisfy me.

Omelette: Why not call the LA Rams, they seemed to doeth the trick last week, or you could get thyself to a Nunnery.

O'Horneya: (thinking), Hmmmmmm. Nix on the nunnery, I'll go call the Rams.

Act IV

Omelette's mischance in killing Poncho hastens his departure to UCLA again. Also he needs three more credits for his Masters. He returns secretly again, however, and sends a letter back to the King that he is returning at Spring Break. In the meantime, the death of Lord Poncho and and his secret burial, (and the malfunction of an electric vibrator), have caused the death of O'Horneya. Her brother Larry feels compelled to avenge his family's deaths. King Clyde plots with Larry to kill Omelette with a poisoned fencing foil, in a fencing match between Omelette and Larry.

Act V

Omelette spies on the burial of O'Horneya, and when they all leave, after the funeral he plays with the skeletons in the crypt.

Scene: Omelette holding a skull.

Omelette: Alas, poor Yoraschmuck, I knew him well. He was the court jester when I was a kid. He hath borne me on his back a thousand times. And now he is gone. Too bad poor Yoraschmuck, that you didn't sign up to be frozen. Yoraschmusk, you truly were a schmuck.

Scene: Larry and Omelette are having a duel in the Royal chambers. Watching are the King and Queen and several other royal important people. The ten days have passed and the King has chosen not to be frozen.

Larry: Take that, putz.

He wounds Omelette with the poisoned sword. Omelette and Larry exchange swords in the shuffle and Omelette wounds Larry. Then Queen Gerty drinks a glass of poison and dies. In a final death throe Omelette stabs the King and then pours more poison down his throat. All die.

Enter Fartinbra and his army.

Fartinbra: Looketh at all these dead people. Gathereth them all up, and hauleth them to the morgue.

A Soldier: Lord Fartinbra, this one named Omelette is wearing a medic alert bracelet. It says to call 714 738-5569.

Fartinbra: Call it at once.

Act VI (New Act)

Scene: Five hundred years in the future, Omelette is sitting on a beach somewhere in the universe. Two beautiful girls are sitting next to him.

Omelette: To be frozen or not to be frozen, that is NOT the question.
It is the Answer!

The End

Science Updates

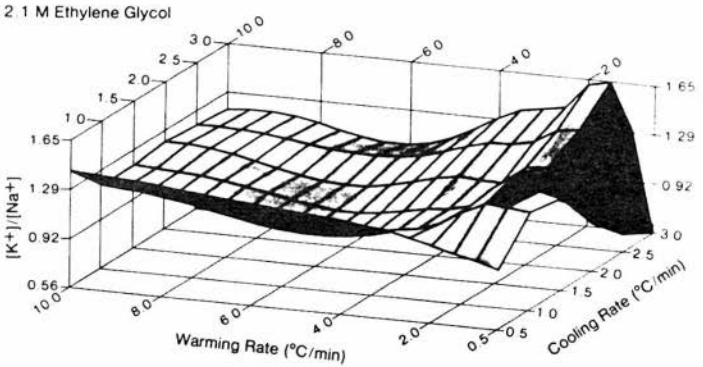
by Thomas Donaldson

COOLING RATES AND WARMING RATES

At present, cryobiology is very much at an empirical stage. Nevertheless, we must suspend people with the information available, not with the theories and understanding we'll have in 100 years. With this in mind I'll note here a recent paper in **CRYOBIOLOGY** (**22**, 378-384 (1985)) by Armand Karow, Helen Hawkins, and others on the exact relations between cooling rate, warming rate, and the survival of kidney slices in cryoprotectant.

Hawkins and Karow froze kidney slices in one of three different cryoprotectants (ethylene glycol, glycerol, or dimethyl sulfoxide), doing so at varying rates. They also rewarmed at varying rates. On this basis, they constructed a grid of 16 different combinations for each of the three cryoprotectants. By measuring function of the kidney slices afterwards, they could construct a diagram of survival as it depended on both of these parameters together.

The surfaces they obtained all differed, but they did have common features. Each had two major peaks and two major valleys. For instance, in the case of dimethyl sulfoxide the peaks lay at high warming rates plus slow cooling rates and medium warming rates plus high cooling rate. Warming rates varied from 0.5 to 10.0°C per minute; cooling rates varied from 0.5 to 3.0°C per minute. Unfortunately for clean theories of cryoprotection, there doesn't seem to be any coincidence between either the peaks or the valleys for each of the three cryoprotectants. Glycerol and ethylene glycol resembled one another most closely, but differ in detail.



The authors feel that their technique of constructing a **surface** rather than a graph reveals a lot more about the best combinations of treatments. Unfortunately, of course, we still lack the fundamental understanding which would allow us to really master freezing and thawing. In its absence, however, work of this sort is certainly worth attention.

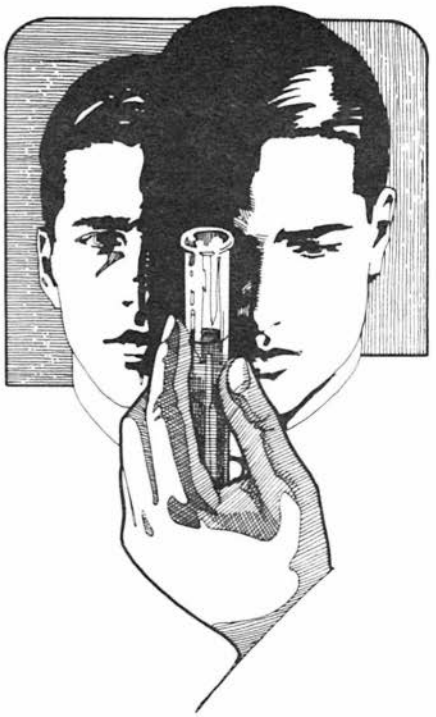
MEMBRANE STABILIZERS IN FREEZING

One very interesting approach toward protection against freezing damage recently appeared in **CRYOBIOLOGY** (**22**, 367-377 (1985)). Alan S. Rudolph and John H. Crowe observed that many microorganisms resistant to freezing contained one of two chemicals in their cell wall, **trehalose** (a kind of sugar) or **proline** (an amino acid). These chemicals act by a different process from the standard cryoprotectants, by stabilizing membranes against the removal of water. Organisms whose cell walls are high in trehalose, for instance, can resist freeze-drying.

Could it be, these authors asked, that these chemicals might protect membranes of animals which don't normally contain them?

They have a tentative YES answer to this question in the case of cell membranes from lobster muscle. They did not attempt to protect entire cells or tissues from freezing. What they did was to prepare sacks of isolated cell membrane from the muscle tissue of lobsters, incubate them with either proline or trehalose, freeze them, and test them both for preservation of structure and preservation of function.

Rudolph and Crowe tested structure by microscopic examination of their membranes while frozen. They tested function by measuring the chemical reactions of ATP in combination with these membranes. In terms of **structure**, unprotected frozen membranes, after thawing, will aggregate. This wasn't so with protected ones. Furthermore, their chemical response continued intact. In fact, by their measurements Rudolph and Crowe found that trehalose or proline protected their membranes better than either glycerol or DMSO.



We still have a long way to go before these experiments tell us a better way to protect our own cells. However the idea of systematically testing ideas gained from cryoprotection of microorganisms is a very good one. After all, this protection must have a **mechanism**. There is nothing about small independent cells, merely because they are "lower" than us in the scale of things, that means they will better survive freezing. They must use some tricks we might adopt.

AUGUST 1986 MEETING CALENDAR

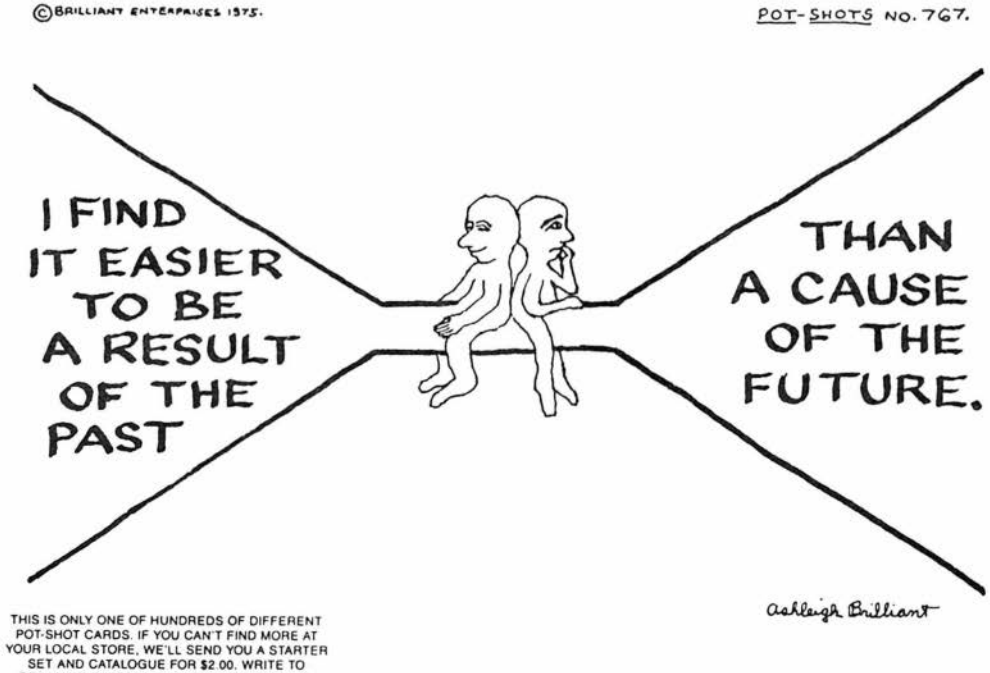
ALCOR meetings are usually held on the first Sunday of the month. Guests are welcome. Unless otherwise noted, meetings start at 1:00 PM. For meeting directions, or if you get lost, call ALCOR at (714) 738-5569 and page the technician on call.

ALCOR
ALCOR LIFE EXTENSION FOUNDATION
4030 NORTH PALM #304
FULLERTON, CALIFORNIA 92635
(714) 738-5569

The AUGUST meeting will be at the home of:

(SUN, 3 AUG 1986) Allen J. Lopp
13354 Veracruz St.
Cerritos, CA

DIRECTIONS: Take the Artesia Freeway (State 91) to Cerritos (Between the San Gabriel Freeway (I-605) and the Santa Ana Freeway (I-5)), and get off at Carmenita Road going north. Veracruz is the third street on the left after 183rd St. 13354 is on the southwest corner of Carmenita and Veracruz. You may park on Veracruz or in the lot of the Thrifty Drugstore on the opposite side of Carmenita.



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