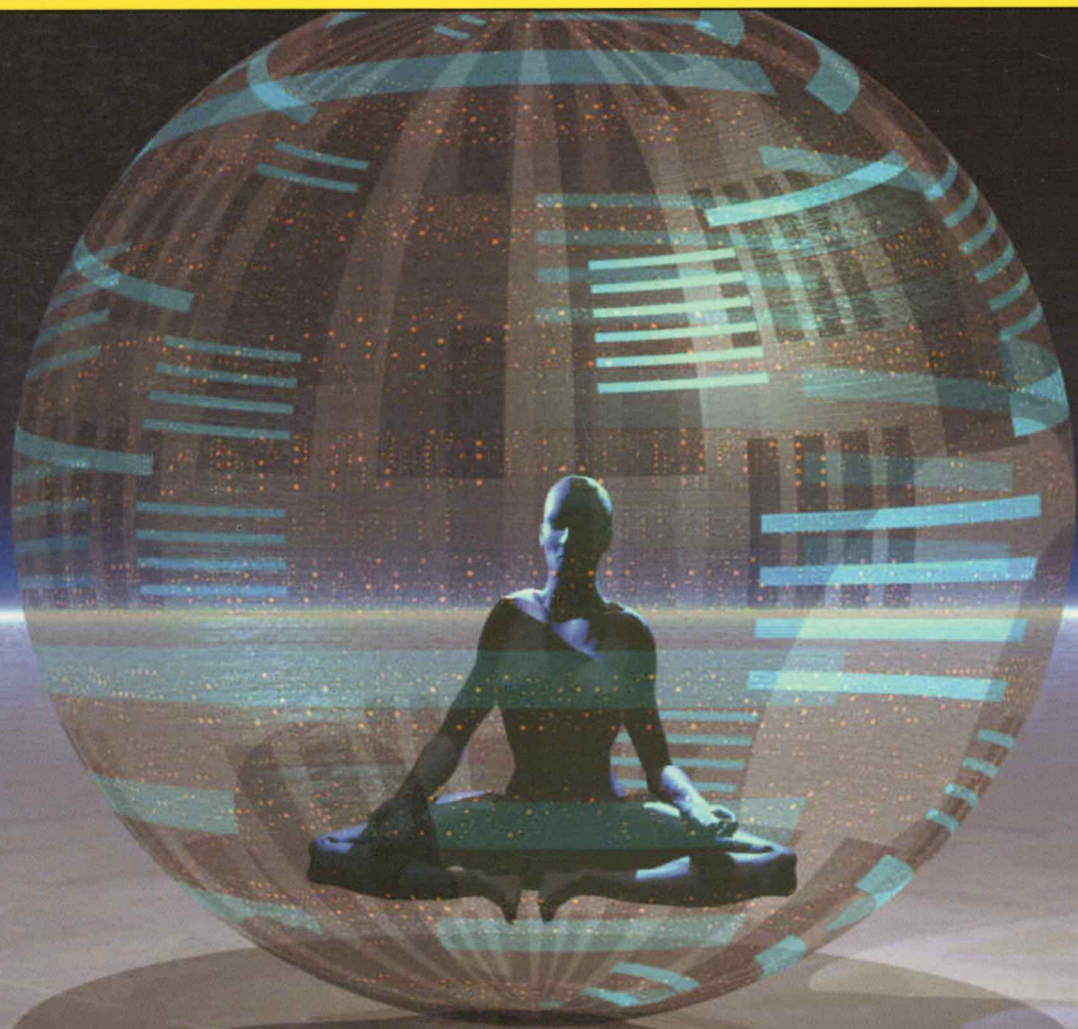


CRYONICS

2nd Qtr. 1999

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Volume 20:2



A Tale of Two Hospitals, or "Staying Alive"

by Linda Chamberlain and Natasha V. More

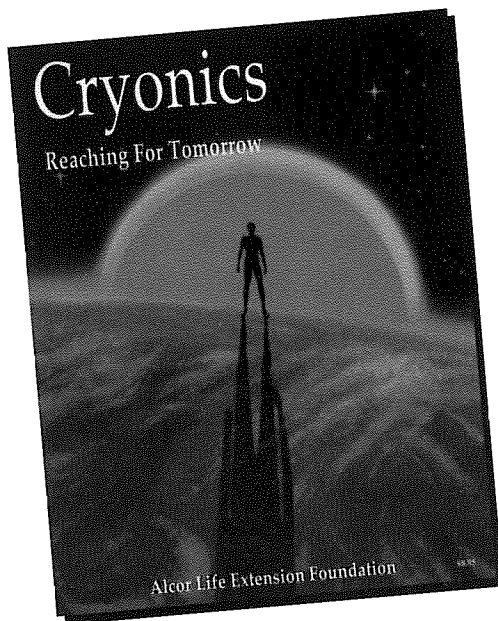
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\$4.50

“What *is* cryonics?”

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

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



“How do I find out more?”

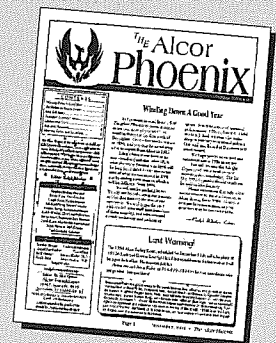
The best source of detailed introductory information about cryonics is *Cryonics: Reaching For Tomorrow*. Over 100 pages long, *Reaching For Tomorrow* presents a sweeping examination of the social, practical, and scientific arguments that support the continuing refinement of today's imperfect cryonic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

This new edition features an updated and lengthened chapter on revival, as well as the appendices “The Cryobiological Case for Cryonics” and “Suspension Pricing and the Cost of Patient Care.” Order your copy for \$7.95, or receive it FREE when you subscribe to *Cryonics* magazine for the first time. (See the Order Form on page 48 of this issue.)

For those considering Alcor Membership. . .

If you're intrigued enough with cryonics and Alcor that you're considering Membership, you might want to check out *The Alcor Phoenix*, Alcor's Membership newsletter. *The Phoenix* is a Membership benefit, so it's free to Members and Applicants, but anyone can receive it for \$20/year (\$25/year if you live overseas). It's released 8 times each year, on the “off months” of the quarterly *Cryonics* (February,

March, May, June, August, September, November, and December). *The Phoenix* is shorter than *Cryonics*, but appears twice as often and is mailed First Class. Being a Membership newsletter, *The Phoenix* focuses on Membership issues such as financing cryonics, staff and management matters, developments in Patient Care and Emergency Response, etc. These issues will impact you directly if you decide to become a Member, and may help you make a more informed decision in the meantime.

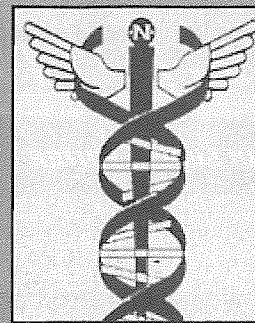




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UP FRONT

BY BRIAN SHOCK, EDITOR

Are any women involved in cryonics?

To read the last few years of this magazine, you might easily come to believe that the cryonics community is strictly a "men's club." Having been involved with this movement through the 1990's, however, I can state without hesitation that women are not only *part* of the cryonics community, they are *pivotal* to it.

With that in mind, when Linda Chamberlain and Natasha More sent me an article about their respective harrowing experiences in hospitals, I decided that this might form the centerpiece of a much-needed *Cryonics* issue about "Women in Cryonics." I immediately went about soliciting articles and opinions from as many female cryonicists as I could find.

Soon afterward I discovered that "women in cryonics" tended to be sufficiently overworked even *without* my nagging requests for articles. Still, a few stalwart individuals managed to squeeze some writing into their schedules. I can't thank them enough, and I would encourage all of them to send me more material for future issues.



Mark Your Calendars Today! BioStasis 2000

June of the Year 2000
Asilomar Conference Center
Northern California



Artwork by Tim Hubley

Initial List of Speakers:

**Eric Drexler,
Ph.D.**

**Ralph Merkle,
Ph.D.**

**Robert Newport,
M.D.**

**Watch the Alcor Phoenix as
details unfold!**

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Editor: Brian Shock

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

ABOUT THE COVER:

CGI art by Tim Hubley

Dear Editor:

I would like to comment on a few articles in the 1st Qr '99 issue of Cryonics.

In the last paragraph of Robert Freitas's nice piece on Nanomedicine he states that because nanomedicine would increase the standard of living for all and give humans long lifespans, they will have little motivation to make war. People are certainly willing to risk the even short lifespans that they now have for war even if they have plenty (ie. Saddam Hussein and others) so I'm not sure this logic will prevail. More complicated individual psychologic and neurophysiologic factors related to behavior and personality will need to be dealt with, and this gets into the ethics of programming people vs. having them be naturally themselves. I assume all will be free to choose nanomedicine treatments or refuse them if we are an advanced society, so some groups are sure to refuse on some cultural/religious grounds or personal preference and conflicts will continue.

I was very impressed with the study done by Dr. Badger on consumer attitudes and familiarity with cryonics. Although he correctly points out the limitations of the study on p. 26, he states on p. 31 that regression analysis suggests that demographic factors have limited usefulness in predicting dispositions toward cryonics. I think his comment about the small number of subgroups however make the data difficult to interpret, ie. was there enough statistical power in the number of sub-

jects? I'm also interested in the researcher's connection to the study. Was it for personal interest? For professional publication? Was it funded and if so by who, etc?

Finally, I'd like to comment on the review of Carpenter's Human Neuroanatomy by Dr. Donaldson. I read this book in medical school and it is an excellent text on the subject although I think over-technical for someone not dissecting brains and intensively involved in this study. It certainly has some relevance to cryonicists in the overall ideas of what areas of the brain we need to protect in a suspension (ie. the limbic system which is thought to house our memories) and the like. I would like to stress to the readers, however, that our current state of neuroanatomy and physiology knowledge is very far from this book being a road map that if we just follow we can repair a freeze-damaged brain. We are still at the stage of looking at the earth from the moon with the naked eye and seeing how the continents are connected; maybe we can see the major cities, but we do not know the street address of all the intelligent inhabitants. I am referring to information on all the trillions of dendritic and axonal connections and their correct neuroreceptor(s) distribution and many other molecular parameters that will not be available to us anytime soon, not to mention how to fix it. Nonetheless, I commend Dr. Donaldson for his spurring our interest in pursuit of these goals.

Douglas Berger, M.D.

The editor comments:

1) *An increase in lifespan might not decrease the motivation for armed conflict as much as it might increase the motivation to avoid armed conflict. That is, the longer a person might potentially live, the more years he puts at risk by going to war.*

Of course, evaluating this risk/reward ratio demands a certain amount of rationality, and one might argue that war involves the absence of rationality.

2) *Dr. Scott Badger tells me that personal interest did indeed motivate his study of public attitudes toward cryonics-related subjects. Although he originally funded the survey Web Site on his own, he was later compensated for this by the Alcor Foundation and others. I cannot say if Dr. Badger intends to publish this work in an academic journal (aside from the Journal of Transhumanism, of course), but I would certainly encourage him to pursue this.*

3) *I believe that Dr. Donaldson harbors far fewer illusions about current knowledge of microscale neuroanatomy than the average cryonicist. His columns in Cryonics and his posts on CryoNet frequently express despair at handwaving assumptions that "a solution exists" to the nightmarish complexities of repairing a human brain damaged by freezing.*

Dear Brian

Here's a nonserious proposal for promoting cryonics that I haven't seen discussed yet.

As should be evident by now, *fin de siècle* America is experiencing a wave of nostalgia for postwar popular culture. This nostalgia might indicate some deep cultural pathology, like a failure of nerve regarding progress, but that would require another venue to explore adequately. For now consider that we're seeing renewed interest in "Swing," the Rat Pack, film noir, etc., as well as the re-emergence of old vices like cigars, heroin, and absinthe. Hollywood is tuned into this trend with recent films either based on old television series or else idealizing life in earlier decades, even as recently as the 1980's. I would argue that the renewed interest in Ayn Rand and Robert Heinlein seems driven in part by this nostalgia. Before long, will we be seeing science and engineering students at university carrying sliderules to class?

Since the cryonics movement arose in the context of this postwar American culture, I was wondering whether there is a way to portray signing up for cryonic suspension as somehow fashionably "retro" to appeal to this nostalgia. We lost an opportunity with the late Timothy Leary, whose values mainstream Americans found offensive in any case. But there might be a more effective way to exploit this trend for our purposes.

And ideas?

Millennially yours,
Mark Plus

The editor replies:

I wouldn't argue with your observation of the millenarian nostalgia trend. I'm told that Disneyland has even converted its "Tomorrowland" into a version of how past decades might have envisioned the future.

But how do we take advantage of this? Cryonics in the 1980's wasn't terribly different from cryonics today. Cryonics in the 1970's was tiny and struggling at best, and truly disastrous at worst (e.g. the Chatsworth tragedy). In the 1960's, cryonics was more talk than action and more fiction than fact.

Still, 1960's naivete may have offered a few appealing images for us. Who can forget the magazine covers with patients wrapped in silvery "futuristic" sheets of aluminum foil (done solely for aesthetic effect, the oldtimers tell me)? What Gen-X'er hasn't enjoyed the kitschy glass-walled cryo-chambers of Mission: Impossible or Star Trek? Who doesn't miss the early pioneers of cryonics capering around the tv talk-show circuit with the likes of Mike Douglas, Merv Griffin, or Johnny Carson? Perhaps in our zealous efforts to turn cryonics into a functional movement, we've lost any sense of panache.

In order to take two steps forward by taking one backward, maybe we need to enliven our image. Instead of calling our frozen friends "patients," why not officially re-dub them "cryonauts?" Instead of just sleeping bags for those in cryonic suspension, why don't we dress them in spacesuits? Instead of giant, vertical, opaque steel cylinders for stor-

age tanks, we need individual horizontal cryocapsules with hideously energy-wasteful viewports. (We can keep the term "cryocapsule," since this seems suitable for "cryonauts.") Instead of handling the news media with sober spokesmen and the bare facts, we need showmen with flair and flamboyance — comedian Robin Williams might be a good start . . .

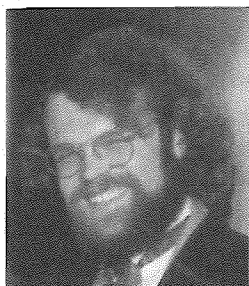
Okay, I admit that I'm being silly. Sorry.

The nostalgia trend was noted at least as far back as that venerable tome Future Shock. Its author, Alvin Toffler, suggested that an increase in social and technological complexity (even back in the 1960's) was driving people to idolize simpler times. Considering how much more complex life has become in the 30 years since Toffler's original observation, nostalgia soon may give way to a full-scale anti-technology backlash, if it hasn't done so already.

I would submit, then, that cryonics is acting in a very "retro" fashion: we are pushing for technological solutions in a society that grows increasingly ignorant and distrustful of technology.

I wish this observation were more encouraging.





Women in Cryonics?

by **Brian Shock**

As of this writing, the Alcor Life Extension Foundation has 458 suspension members. Of these, 93 — or 20% — are female. Considering the obvious statistic that at least 50% of world's population is female, this discrepancy has always begged a question: why are there so few women in cryonics?

Mike Darwin offered some well-considered suppositions about this in his 1987 *Cryonics Magazine* essay, "Women in Cryonics" [reprinted immediately following this column. --ed] but much has changed in the intervening 12 years. Alcor's membership has increased, the concepts of nanotechnology have become better known and accepted, and we have seen an obvious acceleration in biotechnology development with cloning, genetic engineering, stem cell research, and so on. Have the answers to the question of women in cryonics changed as well?

Rather than just race off in the first direction my male prejudices suggested, I first discussed this question with several female cryonicists. Most had strong opinions about the cause of our low female/male ratio, but relatively few wished to go on the record with these opinions. Before speculating on this in the course of the larger argument, let's hear from these women.

Tanya Jones, an Alcor member since 1991 and Alcor suspension services manager from 1992 to 1996, wrote:

"Cryonics depends upon major ad-

vances in technology and understanding of neural psychology, and it is a risky proposition at best with much technical handwaving. This makes many people shy away, men and women.

"We fear what we don't understand, and then we either freeze or run away (screaming or not).

"Many of the women I've met are concerned that they'd lose their support structure, their personal 'society' and thereby, identity in relation to the world. The simple response to this is clearly: take them with you, but it doesn't seem to resonate sufficiently.

"It takes a strong will and reasonable societal support to embrace the value of cryonics. I've felt, and to a large degree still feel, that a male/female distinction is a false dichotomy. Perhaps women are simply more naturally cautious by nature. (I certainly have less scars to show for my 'reckless' youth than every nearby male.) And people will sign up when they believe two things: 1. that they want to live, and 2. that it may work. I have enough information to believe that it may work, and so do most people, which leads me to question the intent to survive. This is not something which you can examine directly, and is simply a decision each individual must make for themselves."

Among the many different factors Ms. Jones lists are lack of understanding for the principles behind cryonics (a problem for both women and men, I suspect), loss of social structure, and relative caution.

Kathy Kriese, an Alcor member since 1997, wrote:

"There seem to be a three main stages people evolve through before signing up for cryonics: awareness cryonics exists, confidence of cryonics' success, and suitability for the specific person. It seems as though women drop off from barriers at each of these stages faster than men.

"I think most people are exposed to the idea of cryonics through science-fiction-themed books and movies. Though both books and movies can gain mass audiences, traditionally women are a minority of science fiction enthusiasts.

"Once exposed to the idea, a person must gain confidence the procedure can work. People with a scientific bent can more easily read and converse about the freezing procedures and the requirements for revival. Here again, science is an area where there still exists only a minority of interested women.

"Then, once one is convinced cryonics can work, suitability for oneself comes into play. Traditionally, women are more concerned than men about maintaining relationships with family and friends. So, unless a typical woman's family and friends sign up as well, it is less likely a woman will sign up. Also, women traditionally have been raised to become unselfish family caregivers, taking care of others before oneself. Some people perceive cryonics as selfish (spending money on your own cryonics arrangements rather than giving the money to heirs) and this would

be another barrier for women to overcome. I found it interesting the exploratory survey printed in the 1Q1999 Cryonics confirmed these suitability barriers exist more for women than men (though this was a non-random sample of participants and so we shouldn't generalize from it).

"So, here are my generalizations about women who sign up for cryonics:

"1) They are interested in science fiction.

"2) They have gained a scientific background.

"3) They received a non-traditional upbringing and so have fewer traditional norms to overcome.

"4) They know family or friends who are cryonicists.

"For myself, I can answer these statements are true.

"1) I especially enjoy Star Trek and Babylon 5 shows/movies.

"2) My parents encouraged me to explore many career options, including the sciences (my initial college major was biology).

"3) I received many messages about the traditional woman's role, though they were countered by progressive messages (my Mom re-entered the job market when my brother was 6, the first mother in the neighborhood to hold a full-time job outside the home), so I think I had more to overcome in this area than the others.

"4) Tad Hogg talked with me about details that gave me comfort cryonics actually could work. I then met folks at the first Alcor conference and Northern CA meetings, so I knew a number of cryonicists before I signed up with Alcor."

As with Ms. Jones, Ms. Kriese points out that women must first understand the scientific principles behind cryonics before they can accept it. Ms. Kriese further elaborates possible social factors, such as the need for a support structure of family and friends, and the perception of cryonics as "selfish."

Kennita Watson, an Alcor member since 1994, wrote on the CryoNet email

list (Message #11352, March 3, 1999):

"I will posit that in general [women] are more concerned with human/emotional issues like these, and less with theoretical issues such as asymptotic approximation to X (absolute precision, infinite lifespan, zero mortality, etc.).

"From my Web search I note that only 12% of Ph.D.'s in mathematics are awarded to women. Some other interesting tidbits:

"Within science and engineering, women are more highly represented in some fields than in others. Women are more than half of sociologists and psychologists but are only 9 percent of physicists and 8 percent of engineers. ... Doctoral women scientists and engineers are likewise more heavily represented in some fields than in others. For example, women are 41 percent of doctoral psychologists, and 28 percent of biologists but only 4 percent of engineers."

"(<http://www.nsf.gov/sbe/srs/nsf96311/5women.htm>: Women Scientists and Engineers, 1996)"

Ms. Watson's brief comments seem to bring together two of the previous factors, with the statement that women are more concerned with human/emotional (social) issues and less with theoretical (scientific) issues.

(At this point I should note that Ms. Jones called into question the dichotomy between male and female. While this point is outside the scope of the current discussion, I believe I can clarify her meaning: any mental and emotional distinctions between the sexes are a product of culture rather than biology. The debate continues over this issue, but whether culture, biology, or both are involved in sexual identity, clearly "maleness" has a greater correlation with cryonics membership than "femaleness" does.)

Although drawing conclusions from such a small sample of opinions (my own included) is dangerous, I'm willing to accept the risk.

In most non-indigenous North

American cultures over the last 200 years (just for the sake of argument), women were expected to organize all aspects of family life: birthing children, feeding children, socializing children, etc. Although men were expected to provide the raw materials for survival (food and/or money), women utilized these materials to maintain the family's day-to-day survival. Women were therefore conditioned to think in practical terms on a group level. Although this conditioning immediately applied to the family unit, it was easily generalized to social circles or entire communities.

Men were taught to ask, "What's good for me?" Women were taught to ask, "What's good for us?"

Given this, we can easily understand many of the reasons women might list in rejecting cryonics:

Deviation from social norms — In their most basic forms, societies are groups designed to improve the odds that as many individuals as possible survive. "Traditional women," with their concern for survival of families, would naturally consider their society a vital tool. On an unconscious level, then, rejecting social norms (as typified by cultural or religious practices, such as burial) might feel like rejecting survival itself.

Loss of social structure — This might include both the loss of society itself and the loss of specific individuals within the women's social circles. Again, assuming that women value society as a survival tool, the possibility of a leap into the future (abandoning the original society entirely) would seem as terrifying as strolling naked through a jungle. Assuming that women value others more than (or comparably to) themselves, this same leap into a future without friends or family members might engender a massive amount of anticipated grief.

Selfishness — Obviously, the good of the many outweighs the good of the woman herself.

Impracticality — The scientific edu-

cation and thought necessary for an understanding of cryonics involve theoretical considerations, the very opposite of "practicality" (as defined by those things necessary for short-term survival).

Expense — Money spent on cryonics could be used to ensure the family's survival (or more recently, to improve the family's lifestyle).

The good news derived from this hypothesis is best summed up by a quote from Mike Darwin:

"Once a woman perceives cryonics to be a potentially life saving, nurturing thing rather than a threat, she is the most powerful ally cryonics can have."

As cryonics gradually becomes part of our culture, more and more women will embrace it as a matter of course. To aid this process, however, we might wish to stress cryonics' family-related

images:

■ The Alcor Foundation, for example, is very much a "family business": It was created to provide suspensions for its founders' family members.

■ Anyone, whether child or adult, may contract a terminal illness at any time. Cryonics offers loved ones a chance at resuming such an interrupted life.

■ We needn't abandon our family and friends for a trip into the future with cryonics — as Tanya Jones suggests, we should encourage them to come with us. (Husbands take note: some wives may appreciate the sentiment that cryonics could allow you to remain together "forever.")

■ Cryonics patients won't be maintained and revived by strangers. In order for this to happen, we must "take our society with us" into the future, for those people both in and out of suspension. The cryonics group that revives

you will have some connection to the one that suspended you. Your cryonicist friends in the present will also be your fellow revivees in the future.

Whatever your feelings about women, please remember that cryonics cannot succeed without them. They represent approximately 50% of the intellectual, emotional, physical, and financial resources of the world. And I suspect that in at least some aspects, this estimate is ridiculously low.



REPRINT

From *Cryonics*, September, 1987 **WOMEN IN CRYONICS** by Mike Darwin

Some subjects simply cannot be discussed without causing controversy or offending someone. Such will probably be the case with the subject of this essay. No, it's not about abortion or pornography or gay rights. Rather, it's about women in cryonics and women and cryonics. I'll say at the start I mean to offend no one, only to offer some honest thoughts and observations about the nature of the other half of the human race, how they have related to cryonics in the past and present, and how they may relate to it in the future.

The Beginning

I should probably start at the beginning. It's a little known fact that the first man frozen for future revival wasn't a man at all, but a woman. We don't know much about her, not even her

name. We know that she died in Los Angeles around April, 1966, and that she had requested that she be placed into cryonic suspension when she died. When she deanimated she was not frozen, but rather was embalmed. Her son, a reportedly emotionally unstable young man, became consumed with guilt and grief and had her shipped to Cryo-Care's (1) facilities in Phoenix, Arizona and frozen. There she remained in storage at Cryo-Care for less than a year, after which she was removed from her "cryocapsule" and conventionally buried. This suspension is not usually discussed since it was not very public at the time and was considered "uncontrolled." In reality, it was only slightly less controlled than the freezing of James Bedford which came about a year later.

Very early on in the history of cryonics, circa 1962 to 1966, there were a num-

ber of women who were strong advocates for the program. These women included the liberal/humanist activist Marie Phelps-Sweet and, in a less public way (2), Elaine Ettinger, Robert Ettinger's [first] wife. Mrs. Ettinger was reportedly instrumental in motivating her husband to write *The Prospect of Immortality* and was responsible for organizing and coordinating much of the public relations and media attention the book received. Another activist from the early days of cryonics, Marcelon Johnson, is still vigorously working and speaking for cryonics and is an Alcor suspension member. (3)

However, after cryonics had been around for awhile and public and scientific reaction hardened against it, women, a small minority within cryonics groups from the start, largely disappeared.

Historical Opposition

Not only have women historically not been attracted to cryonics, they have very often been vigorously opposed to it. In my 15 years or so of cryonics experience, the vigorous opposition of women to cryonics has not been because of a wildly emotional fundamental objection to the premise of cryonics, but rather to the threat it represents to other values which they hold very important. The problem with women and cryonics seems to have at least two parts:

First, historically, women seem far less likely than men to see cryonics as a worthwhile or workable undertaking (for reasons which I will speculate upon below).

Second, women correctly perceive that cryonics may very well represent a drain of time and resources from their family if their men become involved.

What do these two considerations mean in practice? After all, lots of people think cryonics won't work and yet they aren't very worked up about it. As long as they're not forced to pay for it, it is someone else's risk and someone else's problem. However, if a woman's husband or boyfriend or lover is attracted to cryonics and wishes to become involved... that's another matter altogether. Suddenly, it's personal.

Over the course of my career in cryonics I have encountered a fairly large number of men who were absolutely fascinated with cryonics and who were interested in becoming deeply involved with it on every level. Repeatedly, a major "terminator" of such involvement was the woman in such a man's life. Being uninterested in cryonics, she usually quickly came to resent the time spent on it by "her man" and began to apply pressure in myriad ways. In some instances I've seen cryonics cause virtual open war in a marriage or relationship. In almost no case have I seen cryonics "win": a warm bed and a hot meal count for more than a chilly soak in liquid nitrogen and a long-shot gamble at eternity.

Thus, as I see it, women so often become polarized against cryonics because cryonics is perceived as a threat to

the stability and well-being of their family life. It is seen as an alien and intrusive idea which demands major changes in lifestyle, threatens to separate husband and wife (even in death: she goes to the churchyard and he goes to Alcor), and offers the added prospect of draining off resources which are often significant in a cash-tight family setting: insurance and Alcor dues are a vacation for a family of three!

The question naturally arises, "Why don't women see cryonics as a good thing?" or, "Why are there so few women, compared to men, who see cryonics as a good or at least potentially workable idea?"

To answer such a question is to put life and limb in peril. So I'll say at the start, "I don't really know the answer to that question." But I have some ideas and observations which I'll kick around a bit and open up for discussion.

First of all, women, at least historically, do not appear to be risk takers. Yes, I know there are many exceptions to this, but overall I think the generalization sticks pretty well. Women seem to be primarily concerned about stability and security. From a biological/evolutionary perspective this makes sense. They have a powerful responsibility to care for and nurture offspring. They suckle the young and they are most slowed down and burdened by the process of childbearing and child rearing.

Men Are More Adventurous

Men seem wilder and more adventurous than women. They commit more violent crimes, they range over the earth exploring and climb mountains "because they are there." I think it likely that the statistical diversity in behavior between men and women is strongly rooted in the biology of our species. No, I am not excluding the powerful role of society and the environment, but neither can I ignore my 25 years or so of observing men and women and their fundamental differences. Despite radical feminism, women have a far different "feel" to me than men do. And no, I'm not being facetious here. Women's minds and personalities, on average, are very different from men's in a number of critical ways.

Historically then, women have been a tiny minority in a male-dominated cryonics society. Often they have waged a relentless

battle to alienate the men in their lives from cryonics, and their position towards cryonics, from a statistical standpoint, might best be described as adversarial.

Things Are Changing

How do things stand now, over 20 years after the start of the cryonics movement? Are women still a tiny minority and is their position still adversarial? The answers to these questions are interesting. I cannot speak about other cryonics groups since I have no access to their membership lists or to statistics concerning their members. But I can speak about what has been happening in Alcor. And the trend is clear: out of 95 Suspension Members 25 are women. (4) Many are recent additions to the Alcor family and a surprising number are activists. In fact, a surprising number are women who have entered cryonics "singly," without the involvement of a spouse or lover. Typically the woman who comes into Alcor in this fashion is a strong organizer and leader. Marce Johnson has been an active example of this kind of woman for many years. Recently, others have begun to show up and they have quickly assumed a powerful role in shaping Alcor. Sherry Cosgrove, Alcor's former treasurer, entered cryonics "alone" and became not only the Alcor treasurer, but a valued Suspension Team member as well. Brenda Combest similarly entered cryonics on her own initiative and now serves on the Alcor Board, occupies a position on the Suspension Team, and has been a key organizer of fundraising and other events.

And there are others. Angalee Shepherd heard about cryonics, relentlessly investigated the other cryonics organizations and settled on Alcor (5). She has been involved in organizing several Alcor events and has shown a relentless energy in her support of cryonics. Arel Lucas in Northern California has similarly shown outstanding support and enthusiasm in promoting cryonics. Of course Linda Chamberlain, one of the founders of Alcor, has shown so much energy and determination over the years she is almost a legend.

What happens when women do become involved in cryonics is that they very often show a steady, relentless, and consistent level of support which typically overshadows the kind of performance we get from the average male who becomes involved. One interesting thing I've noticed is that I virtually never hear excuses from the women involved in cryonics. If they say they are going to do something, it is usually as good as done. I do not need to make the litany of phone calls to prod and prop up flagging enthusiasm that I often have to make with men. I have come to be spoiled by the women of Alcor; I can virtually cease to worry about a task once it has been accepted by a woman volunteer. Men seem to have the initial enthusiasm, but often seem to lack the patience, tenacity, and follow-through which women provide.

Why The Change?

Why the change? Why are more women becoming involved in cryonics and why are they more relentless in its support once they are involved? I think the answers to those questions are complex and subtle. I can speculate that more women are becoming involved because more women are better educated and more independent today than has been the case in the past. Or perhaps it's just that the evidence for cryonics is getting better and the slow progress and "trailblazing" that's been done has made it seem more workable. Whatever the reason, one thing is very clear: once a woman perceives cryonics to be a potentially life saving, nurturing thing rather than a threat, she is the most powerful ally cryonics can have. In many cases it is the woman in the family that has masterminded signing up the whole family — filling out the paperwork and arranging for the insurance. If a woman sees cryonics as a way to safeguard those she has the responsibility to care for then she will pursue it with the same tenacity with which she would pursue milk for her child or a well-ordered home for her husband.

Does this sound maudlin and/or sex-

ist? Maybe so. But it nevertheless seems to be the case. And I think it is a very positive situation for cryonics. I believe that increasing involvement of women in cryonics is critical to its long term success. I also believe very strongly that a major historical problem with cryonics has been the absence of women in its ranks. For Alcor at least, this situation has already changed. Female faces are common at meetings and the caliber of women becoming involved with cryonics today is in my opinion, on average, higher than that of the men.

The Future

I suspect and hope that a great deal of stability, security, and tenacity will be brought to Alcor by the women who become a part of it. I think even more women would be involved in cryonics if the women who are already involved made a concerted effort to provide a support network for them. I have noticed at cryonics social gatherings that women tend to cluster together and talk together about different aspects of cryonics (and life) than do the men. A more organized structure of support and cooperation among women involved in cryonics might be very desirable. If we do not yet have enough women involved for such networking, perhaps we soon will.

In the colonization of the American West it was the men who blazed the trail. The men were the crazy dreamers and intrepid wanderers — often loners whose restless itch to explore set them moving toward the far horizon. However, it was the women who made homes out of desert and prairie and who became as astute at shooting game and Indians as the men at their sides. Men may have been the first to appreciate the promise of the new world beyond the horizon, but it was women who made it accessible and turned it into home.

I feel very strongly that the same thing is coming to pass with cryonics. There are strong, fine women joining the Alcor wagon train. They bring different skills than the haggard men and loners who've blazed the trail. But increasingly it is the women who do see the cryonics trail, see the tremendous potential of life and well being it offers them and their families, and act vigorously to make it available for them.

As in the days of wagon trains and dusty trails westward, the rest is, or perhaps I should say, will be, history.



Editor's Notes:

(1) The "Cryo-Care" mentioned here was "Cryo-Care Equipment," founded by Phoenix wigmaker Ed Hope in the 1960's. During its relatively brief existence, this company manufactured "cryo-capsules," horizontal single-patient storage dewars with "soft-seal" vacuum jackets. Since cryonics didn't "explode" in that decade as many hoped — and because established companies eventually provided more reliable "hard-seal" vertical dewars — this business constructed only 3 or 4 units. Cryo-Care Equipment was never a conventional cryonics organization, and had no connection to the modern CryoCare Foundation.

(2) Marie Phelps-Sweet (Mrs. Russ Van Norden): suspended August 27, 1967 by Cryonics Society of California, suspension terminated circa 1971. P.37, Cryonics, 4th Qtr 1998.

(3) With apologies to Ms. Johnson for any breach of privacy, she is currently with another cryonics company.

(4) The membership numbers have changed, but proportions remain similar. Alcor's current suspension membership is 458. Approximately 25% of these members are female.

(5) And with apologies to Ms. Cosgrove, Ms. Combest, and Ms. Shepherd, it should be noted that none of these individuals is involved with the Alcor Foundation at present.

A TALE OF TWO HOSPITALS, or STAYING ALIVE

By Linda Chamberlain and Natasha Vita-More

Introduction

By Linda Chamberlain

Just how safe is hospitalization? Are hospitals run primarily for the patient's needs? Is there anything that you can do, cheaply and easily, to help make your hospitalization safer?

In the June 1997 issue of *The Alcor Phoenix*, Natasha Vita-More wrote an article about "CryoBuddies" or "CryoAllies." Although I agreed with everything that Natasha wrote, it took a week in the hospital, almost a year later, for me to become passionate about her idea.

It is human nature to react with urgency only when we can actually see the tiger springing from the bushes. That mechanism may work in the jungle, but it is far short of what is needed to survive in our modern world. Signing up for cryonics is an example of not waiting to see the tiger's claws.

We are Alcor members because we want to stay alive, not because we want to be frozen. This article is about potentially deadly tigers (hospitals), and about ways to protect yourself if attacked (admitted). But advance preparations are needed, and without our fight-or-flight biochemistry surging through our veins, it is too easy to let those details wait until another tomorrow. Natasha and I are telling you about our two very different, but equally alarming hospital stays with the hope that we can create enough passion in every Alcor member who reads it, to move them to action.

Total Isolation by Natasha Vita More

During a time of a digital gestalt, meta-communications, cell phones and beepers, it would seem almost impossible to have difficulty getting in touch with someone, especially in an emergency. Not so. Even today, we need to take precautions so that if and when an urgent situation does arise, we are prepared to deal with

the consequences. Having the phone numbers of Cryo-Buddies and friends is not enough. We need to have a more comprehensive plan. What if a Cryo-Buddy is out of town during your emergency? What if the pager isn't working or the cell phone is out of batteries? What if your emergency is so poorly planned, that it falls on New Year's Eve or some other holiday when people are out of town or unavailable? But then you

say, "Not me -- my life is well arranged, smoothly run, and self-governed."

Look again. An unplanned, unwanted emergency can occur and usually when least expected.

The following is an abbreviation of a recollection. If I could condense it into one short paragraph, I would. It is a situation that I tried to obliterate from my mind, and a time in my life that was bittersweet. Everyone



Linda Chamberlain is one of Alcor's founders (along with current Alcor president Fred Chamberlain). She has participated in numerous cryonic suspensions, including that of her mother, Arlene Fried, in 1990. Aside from serving as Alcor's first president during the 1970's, Linda acted as head of Alcor's Patient Care Fund Investment Advisory over four years (until the advent of the Patient Care Trust Fund), and now serves as an Alcor Director and Alcor CryoTransport Manager.

has a story that has caused irrevocable change or new and deepened insight. As most of you know, privacy, especially my own, is something I cherish. Yet, if we do not exchange the pivotal as well as difficult times in our lives, we may not learn from each other's experience.

The outlook for 1980 was booked with engaging invitations and professional possibilities. I had been travelling back and forth from Telluride/Memphis/New York to San Francisco, producing Performance Art pieces and preparing for a trip to Japan. It seemed to be a flawless trajectory: Japan for three months, Zurich, Switzerland for two weeks, Paris as a guest of the Arts Festival, and then to Los Angeles and Francis Coppola's studio, Zoetrope, to work in HDTV. My career and my life were in full swing.

Preparing for the excursion was minimalistic: a few maps, a translation dictionary, phone numbers of hotels and contacts, passport, plane ticket, and traveler's checks. I liked traveling light.

My agent had booked me at a nightclub in Yokohama, Japan, capital of Kanagawa Prefecture, on southern Honshu Island and the western shore of Tokyo Bay near the city of Tokyo. My act was jazz dancing

with a bit of improvisational comedy. The nightclub was a small, elegant dinner/theater with disco stage and tight security. My schedule was six evenings performing with one full day off, accommodations at a nearby hotel, and a personal driver who wore tidy white cotton gloves. After almost two months in Japan, I loved my routine, the rock groups I worked with, the many aficionados who loved Americans, the modern and sleek nightclub and my paternally affectionate employers.

For me, Japan was a sensorial experience. I was enormously intrigued by the esoteric and avant-garde "club" life found in the city of Yokohama. Within the small exteriors were large rooms, mirror-to-mirror walls and people dancing to their own reflections, and connecting Disneyland like environs to explore -- quite surreal. It was a universe of nightlife and allure. In contrast, the crisp, harmonious, and sometimes assiduous Japanese environment and culture was tremendously appealing. The Japanese sense of design was innately visible in the tea houses, Buddhist temples, noodle stands, and markets. It was even apparent in the school children running together like neatly packaged swarms.

Caught up in the excitement of

touring the cities and countryside, I traveled on my days off. On one particular day, I was visiting Kyoto to recite poetry impromptu at a favored temple, one of the 2000 ancient temples and shrines located in the cultural city.

That morning, I boarded the Bullet train as usual and relaxed in my seat while listening to a concerto of string and woodwind instruments. It was soothing. I still have a picture of myself on the Bullet train that day. Looking at it, I appear calm, although I now detect stress and discomfort in my demeanor. I probably felt something wrong that day, although I didn't mention it to my companions.

Returning to Yokohama, I felt ill. I was sluggish and my period (which was lasting over two weeks) was tiring me. I wasn't terribly concerned about the duration; I had lived in other countries before, and as I understood it, the female cycle could change with geography. It was odd, but again, I didn't consider why I had been bleeding for so long.

That evening I was invited to a dinner with several Japanese friends. During dinner, I felt worse. The dizziness wouldn't stop. I wanted to leave and tried to let my friends know that I was ill. Perhaps the music was too loud, or I was speaking too softly,



Natasha Vita-More studied in Italy on an Art Masters, owned a startup business in Telluride, Colorado covering a full gamut of the arts, and was a speaker at Arts & Sciences. Her videos have been exhibited in Women in Video and the United States Film Festival and her fine arts in Brooks Museum. Natasha's recent project Primo 3M+, a durable future body, is a collaborative effort with scientific team—Minsky, Merkle, Vinge, Hanson, Benford; and her Arts Manifesto is traveling across our Solar System on board Cassini. Today she is authoring the anthology on living longer.



Some of Natasha More's performance art in Kyoto

or my meaning was lost in translation -- my friends didn't understand what I was trying to tell them. In the dimly lit room, their features seemed to sharpen as my voice weakened. "Can somebody help me please," I repeated into *film-noired* faces that gave only blank stares in return.

I could barely stand up, but somehow I managed to leave the table's claustrophobic environment. I grabbed at anything I could lean on and made my way down a hall, trying to get some air. I fell on the floor, gasping for breath while still muttering pleas for help. I don't know how long I lay on the hallway floor before I saw a blurred image of a woman leaning over me, picking me up and helping me into an ambulance. It was Nadori, my dear Japanese friend.

I can still see the patient look on her face as she held my hand while urging the driver to hurry. I didn't feel any pain and I wasn't frantic. Strangely, I was calm for those few minutes. I was in shock, but through the daze, I became fixated by the blood (*my blood*, I would later realize) on Nadori, who was saving my life.

Everything afterward happened fast and the details are blurred. I remember a white curtain and Nadori

trying to talk to me. I remember an operating room and some men that frightened me. I remember struggling as my arms and legs were strapped down to an operating table. I saw knives and I became hysterical.

For days, I was drugged on morphine. When I was finally coherent enough to listen, the surgeon, through my translation dictionary, tried to explain my condition. I can vaguely remember him saying I might die. For a week an elderly woman sat in a chair across the room staring at me. She never touched me. She never smiled. She sat there as I cried from the pain in my back. My legs were numb. I will never forget the isolation I was feeling. It was cold and harsh. It was unbearable not knowing what they had done to me and what was going to happen to me. I was completely alone and helpless.

When I was more aware of my surroundings and able to sit up, I had two visitors: my agent, who had traveled to Japan on my behalf, and Nadori, who was told to explain the surgery to me.

I had suffered an ectopic pregnancy and had been hemorrhaging internally for two weeks. This type of pregnancy develops outside the uterus, in the abdominal cavity. An ectopic pregnancy is a potentially dangerous problem and needs immediate treatment. In the United States, 1-5% of all pregnancies are ectopic. If untreated, this condition is usually fatal; about 40-50 U.S. women die each year from ectopic pregnancy, a number kept relatively low by early detection of the problem. My particular case was extreme -- I was clearly beyond the red-alert stage, and my life was hanging by

a delicately thin thread.

Weeks passed and I received many flowers, especially roses. I admired the roses by day, anthropomorphizing their strength of character, and by night, I helped myself out of the bed slowly, carefully and quietly making my way up and down the hallway. I got stronger.

The expense of surgery and hospital stay were not covered by my insurance. My only option was to continue working. I sat in a chair on the stage while still bandaged and in pain, and badly performed comic vignettes. To add to this dilemma, I began having ocular migraines, causing partial loss of vision for up to 40 minutes. Afraid to tell anyone because I didn't want to go back in the hospital, I kept it a secret.

Soon, my working visa had expired. My employers, along with my surgeon, petitioned the government to renew my visa because I was not well enough to leave the country. Bureaucracy intervened, and it was not renewed. Not only was this a physical dilemma, it was also a financial woe. I chose to recuperate in Hawaii on my way back to the mainland and stayed there many months. On the upside, this turned out to be one of the most creative times of my life (though I wouldn't go so far as to claim that pain is a requirement for



Natasha and Nadori

creativity). My stay in Hawaii was a time to relax, reflect and let my imagination roam freely.

This experience taught me that anything can happen at any time. I was healthy and happy and feeling on top of the world when I got sick. I had no idea that I was hemorrhaging internally for weeks before I ended up on the operating table. I missed the cues and I was unprepared for the consequences.

Times have changed since the early 1980s, with communication technologies and an aggressive individual movement to become more knowledgeable about medicine and our bodies. Yet there are still loopholes. Just this past year, I've heard a number of stories about emergency situations that caused irrevocable changes to peoples' lives. Most of them were flukes or unexpected mishaps. We cannot wait until engineered enhancements to our bodies offer fast-track alerts to ambulances, hospitals and medical teams, as well as friends and family. We have to be proactive in taking necessary precautions to secure our well being.

I've changed the layout of my wallet. Now, I have a big, bold red-lettered "ALERT" card on top of my driver's license so that if anyone wants to find out who I am, they have to see my medical alert information first. I also have a copy of this ALERT card in the bill portion of my wallet; just in case anyone wants to be paid first, they can't miss the alert card. This card contains Alcor's phone number, my blood type, family contacts and Cryo-Buddy phone numbers.

Not enough? I'm more cognizant about medical conditions in places I travel, and voice my concerns when things don't feel right.

I still support simplicity in trav-

eling style. I'd rather not worry about the contents of my suitcase when I can think about more curious things.

An Unexpected Emergency **By Linda Chamberlain**

There is nothing truly extraordinary about what happened to me. That's what makes it so alarming.

Mammogram and ultrasound tests had both shown a lump in my left breast to be (most probably) a benign cyst. My personal physician, however, referred me to a surgeon to discuss having a biopsy to be sure. I made an appointment with the surgeon for consultation on the matter. After examination, he wanted to aspirate the cyst to determine if it was fluid-filled (confirming that it was benign) or a solid mass (confirming the need for a biopsy).

Although I was told that the process was no more painful than a stick to draw blood, it turned out to very painful indeed. The good news was that no biopsy was recommended. I returned to work, still feeling discomfort and becoming progressively tired and short of breath. That evening I went to the Emergency Room with sharp chest pains and difficulty breathing.

An x-ray of my lungs showed that I had a pneumothorax: my left lung had been punctured, expelling air into the pleural space and causing the lung to collapse by 70%. My lungs could not inflate against the air pressure inside the thoracic cavity and my heart was being pushed toward my right lung. Each breath I took made the situation worse. A chest tube had to be placed between my ribs to let the air escape and allow my lungs to inflate again. I was then hospitalized, to protect against infection, pneumonia, or further car-

diopulmonary complications.

The deck was definitely stacked against me. First, I belong to an HMO. Second, I was admitted from the Emergency Room. I became the responsibility of the "doc *du jour*," as unfamiliar with my situation as the ever-changing nurses.

The first two revolving physicians turned me over to a colleague when they went out of town, and the third (a general surgeon) called in a specialist (a pulmonary surgeon). I was grateful for that final decision. The pulmonary surgeon was very competent and quickly got the tube removed from my side and released me from the hospital. Without him, who knows how long I could have remained in the hospital, passed from one doctor to the next?

The nurses changed on 12-hour shifts. This is a common hospital procedure and one that makes it necessary during standby procedures to continually brief new nursing personnel on cryotransport procedures. However, not until being cared for personally did I fully understand the depth of the problems this system can cause for the patient.

The nurses' knowledge of a given patient's situation is only as good as the notes made by previous personnel. If those notes are confusing, nurses have no authority to act on their own judgement. They have to follow rigid rules about what physician to contact, and then wait a specified period of time for that physician to respond before asking another physician to take over, even if the patient is in terrible pain.

Extreme pain, coupled with inflexible hospital regulations, led to a situation where I lost the ability to call for help. I was about to learn what it felt like to fear for your life.

Fred [Chamberlain] had gone out

for just a short while when I began to experience "breakthrough" pain. I buzzed for a nurse. Because the nursing staff was changing shifts, it took longer than usual for a response. A nurse's aide finally appeared. I asked for a shot of morphine (having experienced this before, we had gotten one of the doctors to write instructions in my chart that I could be given morphine injections for these emergencies). The nurse's aide said she would get a nurse, and then left.

More time passed. Breathing grew more difficult and painful. By now I could barely talk or move. My roommate (separated by a curtain) asked if I wanted her to call the nurse again. I couldn't even say "yes" loud enough for her to hear me. The bedside phone rang. I was in too much pain to pick it up or speak. My roommate answered (it was a party line, with a phone at her bed, too) and asked the caller to try again in ten minutes or so, because I was trying to get some pain medication and couldn't take a call.

I felt raw panic. What if I stopped breathing before a nurse arrived? I concentrated with everything I could muster to keep breathing through the pain. I don't know how long I lay there that way. It seemed like hours. It was probably only minutes.

Then I heard Fred's voice, "That was me who called. When Sue said you needed pain medication, I got here as quick as I could." Within moments of the arrival of my CryoBuddy, with whom I have a mutual LifePact, I had been given an injection of morphine and the crisis was over.

Some important lessons became passionately obvious:

(1) Even a seemingly routine and simple office visit can turn into a

major life-threatening episode,

(2) Inflexible, standardized, cost-minimizing hospital routines can be deadly, and

(3) Circumstances can pile up until the situation is out of control.

Just as with biological evolution, the evolution of hospital favors the survival of the institutions (or perhaps the "species") over any one patient (the individual).

One Solution

A life-threatening crisis can appear out of nowhere. Natasha Vita More and I have published these personal stories to illustrate that. You, too, could suddenly find yourself helpless and in need of a LifePact buddy.

This "buddy system" fits perfectly with the LifePact concept. A LifePact is a personal pledge between cryonicists to do everything possible to help the other person get frozen and finally reanimated. Natasha Vita More's CryoBuddy idea adds a new dimension to the LifePact concept: pledging to help each other stay alive.

CryoBuddies aren't just a good idea to think about tomorrow. They could save your life if you have a system in place before you need it. Begin building your own support group today.

Every local cryonics group has a personality of its own, reflecting the unique individuals within that group. The size of your local group and its philosophical make-up will greatly determine how you develop a LifePact CryoBuddy system in your area. Below are a few ideas on how to build a LifePact Buddy System in your area. Pick and chose those ideas that work best for you, but start today.

Start Small, and Build over Time

Don't procrastinate because it seems too complicated. Unless your group has organizer-types and the commitment to put a lot of time and energy into a complicated system, start with something simple. With time and more cryonicists in your area, you will be able to improve on the effectiveness of your system.

Make a LifePact with at least Two Others

Resolve today that you will make a LifePact (a mutual commitment) with at least two others. To pick those important individuals, ask yourself these questions:

- Do I want my CryoBuddies to be family members?
- What if my family members don't share my cryonics ideals?
- What if my family members don't live close to me?
- Should my CryoBuddies also be my medical surrogates?
- Who can I best trust to be responsible and be there when needed?

How can you find other cryonicists that have the qualities you are seeking? Attend your local cryonics meetings. Help organize regular meetings if your area doesn't already hold them. Socials are a great way to meet other cryonicists (that you have enough in common with) that you feel comfortable making this kind of mutual commitment. It will also be important in keeping in touch with each other and updating your commitment and expectations.

Exchange Information

The simplest beginning is just to find two CryoBuddies and then exchange important information. You

will want to exchange:

- Contact information such as phone numbers and addresses.
- Normal (work) schedules.
- Frequency of travel, and normal locations.
- Important medical data (allergies, special problems, etc.)
- Copies of cryonics paperwork, religious objection to autopsy, standby agreements, etc.

Stay in Touch

Build your relationship by getting together frequently. As a minimum, give each other a call once a month to keep in touch with the changes in each other's lives. Know when your CryoBuddy is going in for surgery, or on vacation.

Isn't this sort of communication the responsibility of your cryonics organization? No! Most cryonics groups' contracts state that communication of current address or health status is the responsibility of the *member*. As much as an organization might prefer to watch over every member day and night, this is no longer practical. For example, with less than 500 members, Alcor Central already has difficulty keeping track of its members' situations; imagine the magnitude of that problem when Alcor has 5,000 members or more!

Developing a More Sophisticated System with Time

With time, you will probably find that you want to develop your LifePact CryoBuddy system to be an even better safety net. Below are a few ideas:

- Consider having a written agreement between you as to what you commit to do for one another.
- Decide how you would be able to handle daily visit rotations (depending on the schedules of those involved).
- Decide what kind of frequency you want as far as staying in touch during times of no emergencies, as well as during emergencies.
- Consider wearing beepers and developing a system of codes so you can alert each other of an emergency situation and a need for help.
- Consider having a local coordinator who would keep track of such things as pending surgeries, copies of paperwork, etc., that your CryoBuddies could call for information rather than doing it all on an individual level.
- Share your good ideas (and those that did not work). Send your ideas and stories to be published in *Cryonics Magazine*. We can all learn from each other and benefit from not having to make mistakes that others have already made.

The LifePact Central Database

As mentioned earlier, the larger the Alcor membership becomes, the more important it will be for members to have a local support group. This doesn't require special training. Your CryoBuddies don't have to be Certified Alcor CryoTransport Technicians -- they just need to be able and willing to help you get the help you need in a given crisis. Alcor Central can add to the effectiveness of local support systems by providing a central database.

All Alcor members are eligible to register their CryoBuddy relationships with the LifePact Central Database. If Alcor receives a call that one of its members is in trouble, it may not have advance standby arrangements with that member, and the situation may not be critical enough to dispatch the Cryo-Transport Team. In such a case, Alcor could call the member's CryoBuddies to help him or her survive that emergency.

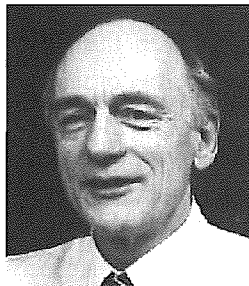
In large-scale disaster situations, another local Alcor group may be willing to help Alcor members involved in the disaster area. The local database could help in situations like this as well.

The LifePact Central Database might be able to help in other ways as well. Please share your ideas about this.



Thanks to all the Alcor members from both northern and southern California who have helped (at area meetings) to develop these ideas about building a LifePact CryoBuddy System.

Linda Chamberlain (linda@alcor.org)



BioTransport, Inc.

"Full Spectrum" Cryotransport Operations

by Fred Chamberlain, III

Background.

BioTransport, Inc. was formed in the Fall of 1997, to upgrade the training of cryotransport (cryonics) rescue teams and equip them with advanced technologies as these become available.

During early 1998, there were efforts to broaden this rescue network beyond Alcor, particularly through cooperation with Twenty First Century Medicine, Inc. From mid-1998 until early 1999, the focus shifted back to developing rescue infrastructure exclusively for Alcor. At this time, the pendulum is swinging again in the broader direction.

Meanwhile, BioTransport's Board of Directors has expanded. We have acquired good legal representation, and are in the final stages of preparing a private offering. Dollar and labor contributions of BioTransport's Directors have swung up sharply in recent months. Short-term product lines and services are being fitted to the principal long-term goal: cryotransport operations, covering the broadest options.

Are Commercially Funded Services Needed?

At present, most cryotransport rescue responsibilities are still borne by nonprofit membership organiza-

tions. Until the early 1990's, it was assumed that these tax-exempt groups would also have to finance the majority of the research. Since that time, large sums have been devoted to research by Twenty First Century Medicine, Inc., with very positive results. A "second dimension" in cryotransport has emerged.

Rescue infrastructure also must be paid for in advance. If we want to use new findings in enhanced cryoprotection and then offer vitrification, we must locate people with suitable backgrounds, train them, equip them with systems which will be reliable in the field, and maintain-upgrade readiness on a continuing basis. Supporting this, we must plan well, obtain financing for the development of the capabilities needed, and apply appropriate management.

Unique Challenges

There is no convenient medical industry precedent for this. Those trained must perform reliably even if seldom called upon. Skills of a cryotransport team must range from negotiations with medical authorities to predicting mortality, starting viability preservation immediately after pronouncement, and getting the same job done as in harvesting organs for transplantation, scaled up

to entire human beings.

Cryoprotection and cooldown add to the complexities. We need a worldwide network of teams, coordinated for rapid response and linked to central station managers, consultants and advisors for application of maximum brainpower in localized situations anywhere. This network must cope with the full range of uncertainties inherent in cryotransport suspensions.

Special Problems with Cryotransport.

BioTransport's operations have to go far beyond ordinary experimental medical treatments. Cryotransport presupposes that currently irrecoverable patients can be restored to life by future technologies. Attempts must be made to preserve molecular structure however possible, even in very discouraging cases. The procedures must range from primitive freezings, which in some cases are all that can be done, to vitrification procedures which will be incredibly challenging from a technical standpoint.

In all of this, validation is lacking, even from a retrospective viewpoint. With an experimental operation, the patient lives or dies. At least we know, without waiting for decades, the outcome! In

cryotransport, as many have pointed out, there is no conclusive "feedback" We must, in effect, "fly blind"!

We cannot assume that all cryotransport cases have an "equal chance". Neither can we confine ourselves only to the highest levels of application. If nothing else, circumstances tend to get in the way. Standardization, case to case, is difficult.

We must apply the highest levels of cryotransport procedures that can be delivered, subject to extremely variable circumstances, constrained by decisions of those making arrangements as to what they can afford. We must also limit our procedures to those we are convinced have at least some chance of preserving memory and be mindful of constraints or special problem areas facing cryotransport teams.

Balance of Research and Technology.

BioTransport must do R&D as needed. Where research is done but technology is lacking, or where the research is lacking, we must do what is required to fill the gap. At the same time, we must not duplicate research, if workable solutions can be obtained under license. From a practical point of view, we hope that most of the basic R&D will be done by others. We would far prefer to contract for this than "do it in-house".

Making technologies "user friendly" is very much on our minds. BioTransport must transform the experimental techniques of research laboratories into reliable equipment and easy-to-use procedures. When a BioTransport team arrives at the side of a patient, we must have "failure-proofed" ourselves. Our procedures may be experimental, but our patients are not "experiments".

The Challenge of Vitrification.

BioTransport does not expect to be the primary developer of vitrification, but we expect to have to "deliver the goods" when the chips are down. Here are a few of the things we will need:

(1) The patient must have a vascular system in reasonably good condition, unimpaired by extensive ischemic damage in areas where we need high levels of preservation quality. The circulatory system must remain intact both for cryoprotection below the freezing point of water, and for rapid extraction of heat with low viscosity perfusates which remain liquid and flow easily, well below the temperatures of dry ice.

(2) The team must be in full readiness to commence procedures at the moment of pronouncement. If, for example, a patient unexpectedly expires during the night with only one or two team members awake, the start of the procedures could be delayed or compromised. The outcome could be a severe loss of preservation quality, on a relative basis. The final result might be more akin to a current-day cryotransport than "vitrification."

[This is a tough one! It is one thing to schedule an experiment and demonstrate a procedure for vitrification in a healthy organism; it is another to apply the same protocol in remote locations where family members, medical caregivers, local officials, and the degraded states of health of the patients are all strongly influencing factors.]

(3) Vitrification storage requires temperature to be tightly controlled, to avoid thermal stress "cracking" at lower temperatures and to avoid "recrystallization" by drifting above the glass transition temperature. There

is little margin for safety. Simple immersion in liquid nitrogen cannot be employed.

This overview of challenges in vitrifying humans shows the exceptional measures which will be necessary to make it practical. Can we find ways to do this reliably? Yes! Will this cost more than ordinary cryotransport? Of course! Will most cryotransport members upgrade to it? We do not know!

In light of uncertainties about demand, Vitrification raises economic questions. How can rescue infrastructure for vitrification be financed, without penalizing those who don't subscribe to the more demanding procedures? Will a stratification of team members as to ability develop, as a result? Questions like these must be resolved, before the development of vitrification delivery teams and their equipment can be properly capitalized.

What about "Regular" Cryotransports?

Upgrades to basic cryotransports are coming, too! Improved medications, ways of cooling more rapidly in the early minutes, and improved cryoprotectants plus freeze-blockers are on the agenda. BioTransport has identified several sources of these technologies and will do what's necessary to secure rights to use them, contingent on the financial strength to do so.

Support of Regional Groups, Domestic and Overseas.

BioTransport's Board has three energetic Directors in Southern California, Russell Cheney EMT, ACT-A, Robert Newport, M.D., ACT-A, and Michael Riskin, Ph.D., C.P.A. They will play crucial roles in a

project to develop model rescue systems for implementation, elsewhere in the U.S. and overseas (for example, Alcor U.K.) Here is a brief glimpse of what's coming, focused on three levels of application:

ATP (Air Transportable Perfusion) Systems.

Developed by Alcor, these are modular cardiac bypass perfusion circuits with all components on a sterilizable plate, in a rugged case that can be checked through as airline luggage. The case also holds a digitally controlled pump that rapidly assembles to the bypass circuit.

BioTransport expects to obtain a license from Alcor to produce ATPs and deploy them to teams which have appropriate levels of training, using capital contributed by investors. There are possible medical applications where sales might help offset the costs of using a smaller number of ATPs for cryotransport purposes. Positive cash flow within two years could be feasible.



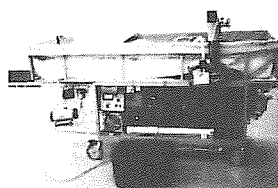
ATP partially deployed for training purposes.

GAP (Gurney Adaptable Perfusion) Systems.

Some local groups, shortly after obtaining an ATP System, will want to move up to an ambulance. Gurneys, the standard carriers for patients in ambulances, can be fitted

with cooling baths, HLR's and other accessories needed for transport. Adding the sterilizable ATP plate assembly and pump to a gurney, with appropriate mechanical integration, is a logical extension.

Mobile rescue carts similar to this have been used in cryotransport for about 15 years. Jerry Leaf, Hugh Hixon, Mike Darwin and other Alcor people constructed one in the mid-1980's. Hugh Hixon created an improved version in the early 1990's. This most recent MARC (Mobile Advanced Rescue Cart) shows how far such a "rolling operating room" can be carried. With on-board power systems and compressed gases, it could be used in an emergency to carry out perfusions almost anywhere.



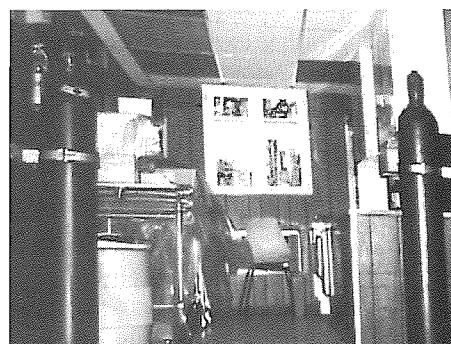
MARC constructed by Hugh Hixon.

The GAP (Gurney Adaptable Perfusion) System will be more limited and more affordable. Its ice bath will be far superior to the collapsible kit currently in use by many Alcor Groups and will be suitable for surgery when an appropriate location is reached. At the same time, GAPs will be far more flexible and lightweight than the mobile rescue carts constructed up to this point.

VIP (Vehicular Integrated Perfusion) Systems

A "mobile facility" is a way of moving the operating room into proximity to the patient. Alcor, through Manrise Corporation, had a

rudimentary unit of this kind in the early 1970's, which served as the procedure environment for Alcor's first suspension in 1976.



"Big Al," early VIP System used in Alcor's first suspension.

The ATP System, highly compact and upgradable for cryoprotection, is compatible with operation in a limited space. Trade-offs of peripheral equipment to support the basic ATP will be part of the design.

In this concept, a carefully human engineered procedure environ-



Bruce Cohen and Bob Newport, M.D. adjust an ATP System during an Advanced CryoTransport Technician Course at Scottsdale, AZ. March 1999.

ment is created within a large vehicle, into which the GAP platform docks, serving as the operating table. Full on-board utilities, surgical lights and automation of perfusion are expected to permit this procedure to be accomplished by a relatively small team.

The efficiencies of the VIP System are threefold: (1) reduced facilities cost, (2) reduced manpower through automation of the perfusion process, and (3) reduced training expenses by way of simplifying operator procedures. The expenses of carefully engineering this system will be repaid many times, not only in terms of the dollars saved, but in terms of the quality and reliability of the procedures delivered.

Final designs of VIP Systems must allow for upgrading to vitrification, providing space, power and weight for added equipment. Any systems for on-board cooldown to dry ice must, in that light, anticipate the need to convert from liquid CO₂ to LN₂ or otherwise add cooling range, with stabilized storage capacity sufficient to move the patient by highway to a permanent storage site. Why speculate on such far-reaching extensions of design? Two reasons:

(1) We know this is where we're headed; We have to plan for it, from the first. The need to upgrade may be upon us before we know it. To design units which could not be upgraded would not make sense, unless we found that the design envelopes were highly incompatible.

(2) It is important to understand that this level of technology cannot be obtained through the donations of a few hundred members of a non-profit cryonics membership organization. It takes time, and dollars. The

earlier you start, the earlier you have what you need.

Is BioTransport, Inc. the Answer?

Here is a brief "snapshot" of what BioTransport, Inc.'s Directors, will be doing over the months ahead, building capabilities to make you safer.



Michael Riskin

Michael Riskin, Ph.D., C.P.A., and long time Alcor Director has tentatively agreed to take the role of BioTransport's President, when the Company is ready to

deliver services to Alcor and perhaps other organizations. He is our key negotiator in exploratory discussions to see if BioTransport can obtain access to advanced technologies, and is evaluating the conditions under which BioTransport might extend service to members of other organizations.



Robert Newport

Robert Newport, M.D., ACT-A, is working out ways to assure that our rescue teams are trained and recertified at the highest levels of skill and competence.

He strongly advocates putting the best obtainable knowledge and technology to work. Bob will be assisting Michael Riskin in parts of the negotiations with other organizations, in addition to serving as BioTransport's Vice President for Medical Affairs.

Russell Cheney, EMT, ACT-A, known to many of you in Southern



Russell Cheney

BioTransport teams in the Los Angeles area, he and Robert Newport will guide the implementation of these systems with other groups throughout the U.S. and overseas, furnishing tech support and more training.



Bruce Cohen

California, will head up the project to implement model rescue systems ranging from ATP upward, including GAP and VIP Systems. After training and equipping BioTransport teams in the Los Angeles area, he and Robert Newport will guide the implementation of these systems with other groups throughout the U.S. and overseas, furnishing tech support and more training.

Bruce Cohen, ACT-A, earlier associated with BioTime, Inc., is moving to Arizona to establish a separate BioTransport, Inc. facility and operations center here.

Bruce's activities in cryotransport date back to the late 1960's. His contracting, engineering and entrepreneurial skills will be brought to bear as ATP, GAP and VIP Systems are made ready for use in the work Russell Cheney and Robert Newport will be doing in Southern California. I will be working directly with Bruce on these projects. So will other Alcor Staff, under contract, as soon as we can work out the details of how to make that happen.



Joe Hovey

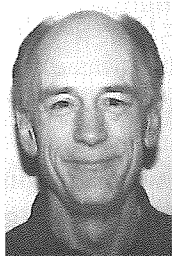
Joe Hovey will be putting his experience in government and industry to work, helping with strategic plans for BioTransport's development. He will also be coordinating the interface between Alcor and

BioTransport, where large exchanges of shares for equipment and intellectual property will take place. In accounting, Joe's long experience with Alcor's financial management will be an invaluable asset, as we plan how to scale up BioTransport's operations proportional to capital acquired, and manage it effectively through incremental funding during periods when that is the dominant mode of support.



Linda Chamberlain will be building on her experience as Alcor's CryoTransport Manager, working with Dr. Bob

Newport and Russell Cheney in organizing teams, documenting all parts of cryotransport operations and creating upgraded procedures and training programs for BioTransport. As we enhance protocols (improved medications, cryoprotectants and ice-blockers) and then move on to vitrification, the challenge of finding good team members and keeping them ready to perform will intensify. Upgrading communications systems among team members will be an ongoing project of Linda's. We must be fully functional, network-fashion, in any emergency.



Fred Chamberlain

My time will divide between corporate administration and helping with systems design of the ATP/GAP/VIP Systems. I feel it is vital that

BioTransport get off to a good start, but that would be meaningless if

Alcor were not kept on course also.

Michael Riskin, Bob Newport, Russ Cheney and Bruce Cohen are taking hold as an extremely strong management team. That helps me take a balanced position, thinking in terms of Alcor's long term benefits from BioTransport, and how they may be best secured.

The development of organizational interfaces through which BioTransport might serve both Alcor and other organizations will be delicate and complex. We need safeguards to prevent conflicts of interest and to assure appropriate quality of performance. These considerations will touch all organizations involved, especially Alcor, since it will be the first to contract for service from BioTransport, Inc. Alcor must be securely protected in its access to services. If this is done well, any other group with which BioTransport contracts will benefit by this same measure of security.

Service to Organizations Other Than Alcor?

All of BioTransport's Directors are presently Alcor Members. Alcor is presently the only client of BioTransport's. After a definitive service agreement is worked out with Alcor and agreed to, this may be broadened. Informal talks are already underway with other organizations, but there is nothing to report as of the date of this article. Developments like this take time.

One Year From Now.

A year from now, at Alcor's *BioStasis 2000* Conference (Asilomar, California), BioTransport expects to give all who attend an opportunity to see what has been accomplished. You'll surely see

ATP's and a GAP, along with (maybe) a VIP.

BioTransport's short term pursuits are expected to include compact cardiac bypass units for emergency cold-water rescue, clinical monitoring systems in laptop computers, and innovative programs in viable tissue storage.

By *BioStasis 2000*, according to plan, BioTransport shares will be available for public sale in California through a DPO (Direct Public Offering.) There will be a long range "blueprint for getting there" as well, and ways for you to be part of the program in addition to just investing.

One Month From Now.

BioTransport, Inc. will give a presentation on Sunday, May 9, 1999 at 11:00 a.m., in Laughlin, NV at the High Rollers' "Conference on Cryonics and Low Temperature Medicine." If you can come, we'll see you there!



Telling Mom and Dad: Another Perspective

Editor's Note:

In the 1st Quarter 1998 issue of *Cryonics*, I wrote an editorial about discussing cryonics arrangements with family. Of course I spoke from the viewpoint of my own bland Midwestern upbringing, ignoring many of the more interesting (or perhaps more realistic) family situations.

The author of this article, a librarian in her mid-30's, had some very different experiences from mine. In keeping with the article's theme of imperfect communication, she prefers to leave her identity private. As she puts it:

"Pardon my sappiness, but if just one more cryonicist explains his plans to his family (and his family gets over it), that's better compensation than even a byline with a bio that includes 'Goddess of Truth and Light.' Almost."

Well, my father knows now. Everybody in my immediate family knows about my cryonics plans. I didn't exactly sit down with them all and discuss it calmly and rationally. My family communicates more by hint, pretending it's not really happening. The process of talking about cryonics was rather long and extremely indirect, sort of like getting a date in junior high school.

It helped that my husband, Steve, signed up first. He made his cryonics arrangements a year or more before I did, and let my family know much, much sooner than I did (and much sooner than he let *his* family know, but that's another story). Steve has always been very relaxed with

my parents. He would undertake long discussions with my father, trying to convince him that the economics of the 1950's didn't apply quite so much in the Information Age and that the protectionism of Evil Japan was no big threat. Steve would also talk science trivia with my mother, who is a retired science teacher. The idea of cryonics came out in one of these routine conversations. I remember telling my mother over the phone that Steve was actually going to be frozen when he died.

I should mention here that my own reaction to cryonics was, as I now understand, rather idiosyncratic: the only thing that bothered me about it was the suspension funding. It

seemed like an awful lot of money to spend on something that didn't work yet. I was glad Steve chose neuro suspension only because it was half price, and it never occurred to me that this might be disgusting or frightening — it was *half price*, for crying out loud. Since I learned my attitudes about money from my parents (who grew up during the Depression), I never considered that their reaction would be different.

Well, my mom's a trouper. To this day, I don't know if she's upset about the fact that my husband's going to get his head frozen when he dies (or rather, "if" he dies, for you particularly optimistic types). I don't think mom was greatly disturbed;

"better him than me," she was probably thinking. For more than a year, every time we visited my parents, my father would make a big joke of checking Steve's neck to see if Alcor had tattooed a dotted line around his neck to make removing his head easier. For some people, this would have indicated nothing more than teasing humor; for my father, this was a sign of that he felt genuinely upset.

It was about a year later before I decided to sign up. Initially I wasn't very serious about it; cryonics arrangements were no skin off my teeth, and would make Steve happy.

Another year later, I was walking through the woods on my lunch hour, looking at flowers, when my brand-new antidepressant medication produced a moment of actual euphoria. I usually walked with a colleague of mine, who was always exclaiming over the beauty of flowers and butterflies; I'd look and think, "Yes, yes, very pretty. Are we there yet?" But on this particular day, I saw some baby azaleas and felt good about the experience.

A day or two later I was driving to work, singing in the car, and felt good once again. It occurred to me that most people driving a car on a pretty day, singing along with the radio, and doing a little car-dancing at the red lights, probably felt good about it. This might even be normal.

It was at this point I decided I really *wanted* to live a long time. I reasoned that if I hung around long enough, antidepressant medications could eventually become very good indeed and I could feel happy any time I happened to be having a good day.

I still despaired of telling my family. There's really no chance that somebody's going to write a tactful

little book of exactly the right thing to say to *my* family about my cryonics plans. My family is weird. (Well, every family is weird.) I knew my father would be very distressed and there would be yelling and much lecturing and explanation, the way there was whenever one of my sisters did something he didn't like. Everyone in our family hates such emotional scenes, especially any involving my father. For years, whenever something unpleasant came up, the first thing anybody would say is, "Don't tell Daddy."

Finally, it occurred to me that I could play "Don't tell Daddy," too. I sent my mother a long e-mail message about cryonics, including the Anatomical Gift Act information, how we're paying for suspension, what number to call if Steve and I are miraculously both knocked unconscious and hospitalized at the same time, and so forth. "Oh, and don't tell Daddy," I added.

Mom called me up and was pretty disturbed, especially about not telling my father. (That part still confuses me. Who invented that game, anyway?) But she got over it and seemed to adjust. When my sister went home to visit for Thanksgiving, the two of them e-mailed me to ask why I didn't want to keep my body (which would be discarded after neuro suspension, of course). Didn't I *like* my body? I explained that the neuro option was cheaper, and (having figured out that I was the only person impressed by suspension rate savings) mentioned that cloning or some other future medical technique would give me a body a lot like the old one. I wanted the big focus of my suspension to be on preserving my brain, where the good stuff is.

About two years later, my mother reported that my father asked her if I

was going to get frozen, and she said yes. He's never mentioned a word to me.

But this means that, through fairly circuitous means, everybody in my family knows about my cryonics plans, and nobody will get a nasty surprise at my deathbed. Nobody yelled (at least not at me) and nobody cried (in front of me). I'm glad I didn't wait for Brian Shock or somebody to write the perfect booklet on *How to Talk to Your Family about Your Cryonics Plans*, or wait until I could gather the family all together and tell them all in some big, frank, open, healthy conversation. I used the communications system we had, convoluted and dysfunctional as it probably is by all pop-psychology definitions. But it's done now. I even wear my Alcor necktag (under my clothes), and two of my co-workers actually know it's there and what it's for.



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A Few Questions and Answers with Robert Freitas, the Author of *Nanomedicine*



Interview by Brian Shock

Most cryonicists agree that some type of nanotechnology will be necessary to reanimate patients currently in cryonic suspension, but few of us have any concrete idea of what form such nanotechnological medicine — “nanomedicine” — might take.

“Nanomedicine” may be defined as the monitoring, repair, construction, and control of human biological systems at the molecular level, using engineered nanodevices and nanostructures. Basic nanostructured materials, engineered enzymes, and the many products of biotechnology will be enormously useful in near-term medical applications. However, the full promise of nanomedicine (including the recovery of cryonics patients) is unlikely to arrive until after the development of precisely controlled or programmable medical nanomachines and “nanorobots.”

Cryonics: Do you believe that nanomedicine might offer a means of reviving cryonic suspension patients?

Robert Freitas (RF): I’ve completed work on *Nanomedicine*, Volume I, which is an analysis of nanorobot basic capabilities. In principle, all of the basic capabilities likely to be required for revival from cold suspension seem accessible to suitably configured mechanical nanorobots. A nanomedical cryonics-revival scenario is tentatively planned for Volume III

of the book. I’m reluctant to provide more detailed answers until the analysis is complete.

Cryonics: Presumably a certain amount of the repair process for cryonics patients would occur while they were still frozen. Would low temperatures present a problem for nanobots?

RF: The temperature at which repairs take place depends on your revival scenario. But it appears that low temperatures per se present no insuperable problems for mechanical

nanorobots that have been specifically designed for cryothermal operations. Here’s a crude, order-of-magnitude estimate, assuming the traditional approach: One simple method of locomotion would allow micron-size nanorobots to burrow through solid ice at ~1 micron/sec with a maximum estimated power budget of a few nanowatts per device, requiring a power density of ~1 GW/m³ which is high but doable. At that speed you could sprint straight across the 20-cm anteroposterior axis of the frozen

human torso in 200,000 sec (~ 2 days), which suggests a characteristic time for cryogenic whole-body repair of perhaps a few weeks. As for the brain, these nanorobots would excavate water-ice at the rate of ~ 1 micron³/sec-device, so ~ 1 billion nanorobots evacuate the 80% of the frozen 1400-cm³ human brain that is extracellular water-ice in 10^6 sec (~ 2 weeks), collectively releasing ~ 1 watt of waste heat continuously. Simultaneous installation of up to ~ 1 cm³ of diamondoid thermal bus structure holds the temperature differential between center and outer brain surface to an acceptable 1 degree Kelvin during the excavation process.

Cryonics: Forgive the obvious question, but when do you predict the first practical medical nanomachine might come about? What is its most likely function? How long after this might we expect a nanomedical approach to reviving cryonics patients?

RF: I would not want to offer a prediction, but my personal

opinion is that extremely primitive mechanical nanorobots could appear in the research laboratory 10-20 years from today, winning some clever experimentalist the Feynman Grand Prize for building the first programmable nanoscale assembler. Commercially-available medical systems might arrive a few years after that. Early systems would be used for ultra-rapid diagnostics, lab analysis, and home test kits, all functioning completely ex vivo. These might be followed by applications directed to the outside of the human body such as the skin, nails, hair, and clothing. In vivo medical nanorobots come later, as these will likely be more complex and may require more extensive regulatory approvals.

How long until cryonics patient revivals? History suggests that ~ 30 years often pass between initial laboratory breakthrough and widespread adoption by, say, half of the general population. Marconi's first radio was in 1895; 50% of all U.S. households owned a radio by 1930 (35 yrs). The Duryea brothers built the first gasoline-

powered U.S. car in 1893; by 1922, total U.S. motor vehicle registrations per household reached 50% (29 yrs). Baird and Jenkins demonstrated the first TV in 1923, and by 1953 50% of U.S. households owned one (30 yrs). The first personal computer (Altair 8800) appeared in 1975; 50% of U.S. households owned a PC by 1998 (23 yrs). ARPANET was started in 1969 by the U.S. Defense Department; internet-accessible U.S. households should reach 50% in a few years (~ 33 yrs). If this same rule of thumb holds for molecular nanotechnology (MNT), then ~ 30 years after the Feynman Grand Prize is awarded we should see widespread commercial applications of medical nanorobots. Thus I would not be surprised if the first cryonics revival was attempted by 2040-2050.



Robert A. Freitas Jr. has degrees in physics, psychology, and law, and has written nearly 100 technical papers, book chapters, or popular articles on a diverse set of scientific, engineering, and legal topics. He co-edited the 1980 NASA feasibility analysis of self-replicating space factories and recently authored the first detailed technical design study of a medical nanorobot ever published in a refereed biomedical journal.

Robert A. Freitas Jr. has just finished writing *Nanomedicine*, the first book to comprehensively address the technical issues involved in the medical applications of molecular nanotechnology and medical nanodevice design.

"Nanotechnology" may be applied to medicine using three different approaches: (1) nanoscale-featured materials, (2) biotechnology, or (3) molecular nanotechnology (MNT). While the book touches upon all three areas, the primary focus is on exploring MNT, e.g. medical nanorobotics, since it is this area that ultimately holds the greatest promise.

Nanomedicine will be published in three volumes. The technical book represents a preliminary attempt to explore the full range of nanomedical applications, along with some details of the required foundational technical competencies. An established biomedical book publisher, Landes Bioscience, has been signed to produce all three volumes.

Now that the writing of Nanomedicine, Volume I, is complete, it is possible to establish a firm publication date. Nanomedicine, Volume I, will be published by Landes Bioscience on or before 1 September 1999. Soon thereafter, the entire Volume will also be available online in .pdf format at the following website:

<http://www.nanomedicine.com>

Volume I of *Nanomedicine* describes the set of basic capabilities that may be required by many, if not most, medical nanorobotic devices. These include the abilities to recognize, sort and transport important molecules (Chapter 3), sense the environment (Chapter 4), alter shape or surface texture (Chapter 5), generate onboard energy to power effective robotic functions (Chapter 6), communicate with doctors, patients, and other

nanorobots (Chapter 7), navigate throughout the human body, within organs or tissues, or even within cells (Chapter 8), manipulate microscopic objects and move about inside a human body (Chapter 9), and timekeep, perform computations, disable living cells and viruses, and operate at various pressures and temperatures (Chapter 10).

Volume II of *Nanomedicine* considers system-level technical requirements in the design and operation of medical nanodevices. Part 1 describes aspects of nanomedical operations and configurations, including scaling factors and general design principles (Chapter 11); control issues including teleoperation and haptic controllers, swarm motions, autogenous control systems, and various operational protocols (Chapter 12); repair, replacement, and reliability issues (Chapter 13); and systems design issues such as tradeoffs between special-purpose and general purpose architectures, and deployment configurations such as nano-organs, medical utility fogs, and replicators (Chapter 14). Part 2 deals with a multitude of issues involving clinical safety and performance, specifically medical nanorobot biocompatibility including immunoreactivity and thrombogenicity (Chapter 15); methods of nanorobotic ingress and egress from the human body (Chapter 16); and possible nanodevice failure modes, environmental interactions, side effects of nanomedical treatments, iatrogenic factors, and other safety issues (Chapter 17). Part 3 summarizes various classes of medical nanosystems, including instruments, tools, and diagnostic systems (Chapter 18); specific medical nanorobot devices (Chapter 19); rapid mechanical reading and editing of chromatin and protein macromolecules

(Chapter 20); and various complex nanorobotic systems that will make possible advanced cytopathology and cell repair, tissue and organ manufacturing, and personal defensive systems (Chapter 21).

Volume III of *Nanomedicine* describes the full range of nanomedical applications which employ molecular nanotechnology inside the human body, from the perspective of a future practitioner in an era of widely available nanomedicine. Proof-of-concept designs for whole nanodevices, artificial nano-organs, and nanomedical treatments include rapid cardiovascular repair (Chapter 22); treatments for pathogenic disease and cancer, with epidemiological considerations (Chapter 23); responses to various physical traumas, burns and radiation exposures, and new methods of first aid, surgery, and emergency or critical care (Chapter 24); neurography, spinal restoration and brain repair (Chapter 25); improved nutrition and digestion (Chapter 26); sex, reproduction, and population issues (Chapter 27); cosmetics, recreation, veterinary and space medicine (Chapter 28); the control of aging processes, eliminating most causes of death prevalent in the 20th century, and strategies for biostasis (Chapter 29); and human augmentation systems (Chapter 30). The volume concludes with a discussion of the sociology of nanomedicine, regulatory issues, nanotechnology implementation timelines, and some speculations on the future of hospitals, pharmaceutical companies, and the medical profession (Chapter 31).

The 6th Annual A4M Conference

by Kathleen Cotter, D.C.

As we approach the Millennium there are many who believe that aging is no longer inevitable. The American Academy of Anti-Aging Medicine (A4M) represents over 5500 physicians and scientists in 44 countries who are suggesting just that. Established in 1992, A4M was the world's first medical society to see aging as a "treatable" condition. The first A4M conference, held in 1993, was to serve as a forum for the sharing of current anti-aging developments among physicians, scientists, and others involved in anti-aging research; despite these ambitious goals, though, it had only 160 attendees. The second A4M conference in 1994 did somewhat better, with 500 attendees. 1995 saw 700 attendees, with 1,500 attendees in 1996, and in 1997, 2000 attendees, 165 exhibitors plus 72 members of

the media were present.

Dr. Ronald Klatz, president of A4M, was not surprised by the huge attendance increase year after year, stating that, "anti-aging is the future of modern health care — 80 million Americans are ready and waiting for this specialty." Attendance figures for the 6th Annual A4M Conference, December 10-13, 1998, seem to bear out this optimism: over 3,000 attendees, 200 exhibitors, and 100 presenters came together to make this gathering a success.

Presentations this year included such topics as the newest cancer therapies; new developments in the diagnosis and treatment of Alzheimer's Disease; cloning of mammals for human transplant and anti-aging therapies; age reversing surgery and cosmetic procedures; testosterone decline as a critical link

between health and age-related decline; the CoEnzyme Q10 phenomenon in prevention of heart disease and cancer; and new research on glutathione, DHEA, melatonin, and hormone replacement therapies. A4M's latest "Infinity Award" went to astronaut and U.S. senator John Glenn, in recognition of his unprecedented return to space travel after 36 years, at age 77.

Alcor's own Fred Chamberlain spoke on the medical ethics of cryopreservation, making a good case for it. During his speech on the third day of the four-day conference, he began by noting that, "a century ago, if a gathering of this size had contemplated, along with the vast extension of human lifespans, assisted suicides, cryopreservation, organ harvesting and human cloning, such a meeting might have been

thought by some to be the work of aliens from Mars! Today these are simply practical issues of medical ethics." He went on to explain cryopreservation, pointing out that although the freezing process causes a great deal of currently irreparable damage, over a hundred years molecular nanotechnology may be able to reverse such damage. While discussing the medical ethics associated with cryopreservation, he noted that the passage of a century would also sweep away present ethical issues, for cryopreservation as well as assisted suicide, cloning, and many

controversial topics. "Ideally," Fred suggested, "none of those presently signed up for cryopreservation will ever need to be suspended. More of those subscribing to cryopreservation as a 'backup' will grow young again instead." He ended by observing that, "Despite this optimism, life is uncertain. As the future grows brighter, so does our determination not to miss out on it. One way or another, warm or cold, we are bound and determined not to be the last generation not to survive!"

By the end of Fred's speech, if I were not already a member of Alcor,

I would have gone up to him and said, "sign me up!"

After the presentations, the Exhibit Hall offered many items of interest. A visit here meant picking up an empty shopping bag (or two) at the entrance, in order to hold the incredible amount of information and samples we were given along the way. Attendees took away lots of "goodies" to give them more energy, strengthen their immune systems, or enhance memory. Among such items were "gummy bears" infused with phytochemicals, free bottles of a new juice drink line by the company Alter Ego (with product names like Immunity Extender and Smartness Enhancer), and sublingual supplements sprayed into the mouth. Besides the tremendous amount of information attendees took away, there was also the opportunity to buy such things as magnetic massagers, water ionizers, hyperbaric chambers, cellulite machines, electronic facial exercisers, and every type of vitamin, mineral, and herbal supplement imaginable.

Overall, the A4M Anti-Aging Conference not only covered the latest in cutting-edge biomedical technology and anti-aging procedures, but also allowed us to meet the world leaders of the anti-aging and life extension movement. I was proud, as a cryonicist, to see Fred Chamberlain and Alcor among this group.



American Academy of Anti-Aging Medicine presents the

6th International Congress on Anti-Aging & Bio-Medical Technologies

- Early Detection & Reversal of Cancer
- Metabolic Disorders of Aging

December 11-13, 1998
Alexis Park Resort & Spa, Las Vegas

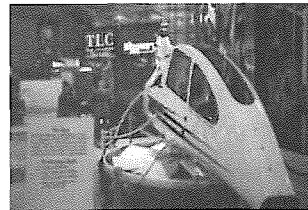
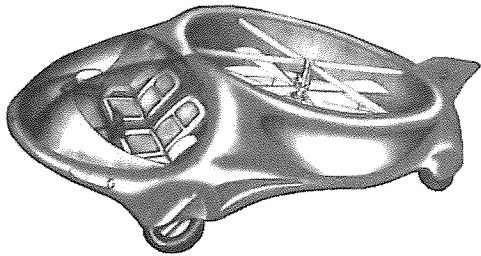
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Logos at the bottom: American Board of Anti-Aging Medicine, Weider Publications, Inc., National Academy of Anti-Aging Medicine, OSU College of Osteopathic Medicine, ECHN.

Things to Come

by Diana Marks

Hello, fellow cryonicists! Do you ever feel apprehension about what changes the future will have brought by the time we are reanimated from cryonic suspension? Perhaps a taste of some innovative technology that's right around the corner might help dampen your sense of "future shock," or even whet your appetite for things to come.



First Prototype, built by Nick Geranio, on display on the Discovery Channel show in San Francisco, April 1993.



Tethered test flight of Autoflight prototype. Pilot: Wolfgang Ott. 1996.

VTOL Flying Car by Autoflight Aviation

Vehicular traffic congestion is a rapidly growing problem. If flying cars were available, Autoflight Aviation believes that approximately 1 million of the 26 million U.S. automobile owners would purchase one within the first five years of production. On that hope, Autoflight soon plans to launch the "VTOL Flying Car" (Vertical Take-off and Landing) as a viable alternative to traditional automobiles.

The rotor-wing VTOL Flying Car will be both an affordable and appealing replacement for traditional automobiles, pro-

viding people with the option of traveling on both highways or "skyways." (Flying Car operators must be licensed as both automobile drivers and a helicopter pilots.) Autoflight's proposed designs will have the ability to ascend and descend vertically in the air as a helicopter, reaching an altitude of up to 12,000 feet and attaining a forward speed of more than 120 miles-per-hour. On the ground, the Flying Car may be driven on any road as a street-legal vehicle and parked in a garage to avoid both the inconvenience and hangar fees of airports.

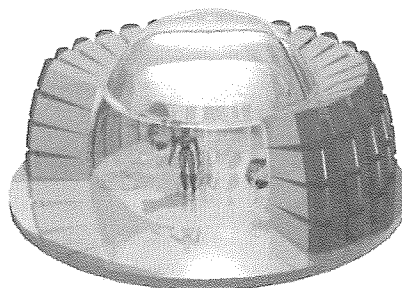
The VTOL Flying Car's inventor, Nick Geranio, thinks that the general public will accept his creation as a safe and convenient means of transportation within approximately two years. The estimated price tag on this magnificent machine: about \$120,000. (The purchase price will include a certificate for pilot's lessons at any accredited flight school.)

For more information, see Autoflight Aviation's Web Site:
<http://www.geranio.com/autoflight>.

3-D Image Projection by California Laser Company

Remember that scene in *Star Wars* (the one retitled "Chapter IV: A New Hope") when R2D2 projected a hologram of Princess Leia asking for help? Ever wanted a machine that could do this games or films? Someday you may have your chance: the California Laser Company (CLC) has developed a 3-D holographic projector that shoots an image from three to five feet into mid air. I myself saw this projector in use, and found it amazing!

California Laser Company, based in Sherman Oaks, CA, is also using this technology to develop a "holo-deck" type of room, just like in *Star Trek: The Next Generation*. By placing stacks of its 3-D Image Projectors 360 degrees around a room and



Computer graphic of CLC's proposed "holo-deck."

overlapping images, CLC plans on creating environments and characters that seem to punch through into the 3rd dimension.

Imagine children playing virtual reality games without wearing special 3D glasses or celebrities jumping out into theater audiences. As you read this, CLC is perfecting systems to make this possible. The way we view movies, advertising, and tv is about to change.

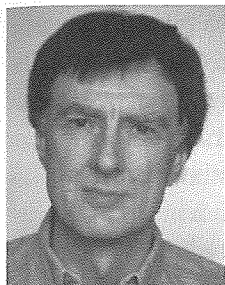


The 3-D Image Projection system for advertising.

The inventor of all of this is again Nick Geranio (of Autoflight). For more information about California Laser Company, check out its Web Site:

<http://www.geranio.com/clc/index.html>.





Too Many Organizations?

by Charles Platt

In North America, almost certainly fewer than 1,000 people have signed up to be cryopreserved after death. An even smaller number of cryonicists are scattered across the rest of the world. Since this is such a tiny field, and no one makes money in it, why are so many companies competing to offer cryonics services?

Often I hear this question from people who are interested in signing up. Equally often it is followed by two more questions: What are the main differences between the organizations? And why did a bunch of people quit from Alcor to form CryoCare Foundation?

Alcor's membership administrator Brian Shock tells me that he, too, finds himself answering these questions on a regular basis. With great trepidation, I will attempt to provide some answers.

Back in the 1960s, Robert Ettinger's book *The Prospect of Immortality* inspired hundreds of readers to write letters asking how they could make arrangements to have themselves frozen after legal death. When Ettinger patiently informed them that no such service existed, some readers banded together and formed groups of their own—such as The Life Extension Society, The Cryonics Society of New York, and

Ettinger's own organization, The Cryonics Society of Michigan. Initially, the purpose of these groups was to disseminate information and encourage large corporations or wealthy individuals to take cryonics seriously and establish properly funded corporations that would offer service. When this strategy failed, some regional affinity groups started trying to offer services themselves. Thus, cryonics was fragmented at the start purely for geographical and financial reasons.

I'll skip nimbly over the next twenty years, which featured some factionism, periods of apathy, and one major scandal which brought down The Cryonics Society of California. By the mid-1980s, when I entered cryonics myself, there were five primary organizations: Trans Time, The American Cryonics Society, The Cryonics Institute, The Immortalist Society, and Alcor Foundation. All of these groups still exist today, although Trans Time seems to have suspended most of its operations.

Trans Time existed in Northern California to do the "hands-on" work of freezing people, while The American Cryonics Society employed Trans Time's services and, as a nonprofit, tax-exempt organization, received donations and patient fees. In

Michigan, the Cryonics Institute also was created to provide cryonics services and patient storage, while sharing its address and some of its membership with The Immortalist Society, a nonprofit, tax-exempt entity that received donations. Alcor was and is a "full-service" non-profit, tax-exempt organization that does the hands-on work *and* manages the money, all under one roof.

Alcor experienced the fastest growth rate of any cryonics organization in the 1980s, promoting its state-of-the-art technology persuasively via a monthly magazine. The Cryonics Institute offered cheaper service, but pursued a policy of lower-tech cryopreservation, largely performed by morticians. Indeed, then-president and founder Robert Ettinger wondered publicly if the elaborate perfusion protocol developed at Alcor by Jerry Leaf and Mike Darwin might actually be counter-productive, since we have no way of knowing the capabilities and preferences of future scientists.

The American Cryonics Society and Trans Time experienced various personality conflicts, and ultimately the groups split as a result of disputes over a building that had been jointly purchased in 1992. Meanwhile, Alcor experienced two highly traumatic events. First came the Dora

Kent case, which triggered an investigation by a local coroner. All charges were dropped, but Mike Darwin, who had served as President of Alcor, stepped down and became less influential in establishing policy. Next came the death of Jerry Leaf, who had not only been codeveloping Alcor's perfusion protocol but also had played a role, comparable to Darwin, in determining policy.

Some of the internal disputes that followed at Alcor involved location (should the organization stay in Southern California or move to Arizona?) and money (should patient funds be spent on a new building, if the organization relocated?). Other disputes were entirely personal, concerning who should run Alcor.

The text of many of these arguments can be found in the archives of CryoNet, the online mail list. Personally I prefer to forget most of the acrimony, but I draw one important lesson from it. I believe that behind many of the disagreements lay a fundamental difference of priorities. On one side were people whom I will call the techno-radicals, who placed a lot of trust in nanotechnology to undo freezing damage, seemed basically sanguine about the state of cryonics and Alcor in particular, and believed that the answer to most problems was faster membership growth. On the other side were a smaller group whom I will call the bio-conservatives, who were deeply concerned by ischemic damage, freezing damage, and other immediate problems. The techno-radicals tended to be confident; some of them accused the bio-conservatives of being "alarmists" or "trouble makers." Meanwhile some of the bio-conservatives accused the techno-radicals of being in denial and practicing "feelgood cryonics."

This characterization may be overly simplistic, yet when a split occurred, almost all the people who left Alcor turned out to have the bio-conservative mindset.

Initially, Mike Darwin and Paul Wakfer formed an entirely independent company to pursue research, mainly funded by Wakfer. Within a year this company was capable of doing state-of-the-art human cryopreservations. Soon after this, in the fall of 1993, other Alcor malcontents formed their own cryonics organization, named CryoCare Foundation, which relied upon the Darwin/Wakfer company (subsequently BioPreservation, founded by Mike Darwin) for standby, transport, and perfusion.

Coincidentally, Saul Kent and his business partner Bill Faloon established 21st Century Medicine, an entirely independent entity dedicated to research. BioPreservation soon moved its equipment to share the new building owned by 21st Century Medicine.

For the next six months, half-a-dozen activists debated the best way to structure CryoCare. Ideally, of course, a cryonics organization should be incorruptible, stable, financially prudent, and self-sustaining for at least a century, despite all the well-known failings inherent in human nature. How could this be achieved?

The activists (of which I was one) built upon an idea originally proposed by Alcor director Mark Voelker: to "unbundle" cryonics services. We imagined a future in which many small companies would compete to do the medical work of standby, transport, and perfusion, much as many businesses compete to offer services such as blood analysis or MRIs to hospitals. Also we

imagined companies competing to provide long-term storage, which we felt was best done on an entirely separate basis, since keeping people frozen is a less legally risky business than standby, transport, and perfusion, where potentially hostile relatives, hospital authorities, or coroners may be involved.

Under our plan, CryoCare would take the legal responsibility for its patients, but would subcontract the hands-on work to the competing service providers. As free-market advocates, we believed that competition among these service providers would keep them active and honest more effectively than a rigid set of corporate bylaws, and we liked the idea that each CryoCare member would be free to select a service provider of his or her choice. Moreover, through a system of Patient Advocates who would retain some authority over individuals in cryopreservation, any patient could be relocated if one storage service seemed unreliable, poorly run, or overpriced.

Finally we created one more entirely separate company to manage patient funds, thus avoiding any temptation for the parent cryonics organization to spend the money inappropriately on other aspects of cryonics.

I still have faith in this business model, but in retrospect I see that it was premature. CryoCare started out with only one service provider for standby, transport, and perfusion: Mike Darwin's BioPreservation. No other competitors ever appeared—and thus CryoCare ended up dealing with the exact opposite of a free market in service providers. It found itself faced with a monopoly!

To manage long-term storage, a company named CryoSpan was cre-

ated by Paul Wakfer. After protracted negotiations, The Cryonics Institute offered its own storage facility as an alternative for CryoCare members, which we saw as a very important step toward our "free market" model. But by this time all CryoCare members had signed up for storage with CryoSpan, and no one ever switched their arrangements to CI. Some people undoubtedly made a conscious decision to stick with CryoSpan, but in other cases I suspect people didn't bother to switch simply because they couldn't face the chore of completing new paperwork. Either way, after less than two years, much to our regret, CI cancelled its offer. After that CryoCare faced a monopoly in patient storage, as well as in standby, transport, and perfusion.

Are we confused, yet? To sum up: Alcor almost certainly has more members than any other organization today, though this claim remains speculative because the American Cryonics Society does not reveal its figures and the Cryonics Institute includes, as a member, anyone who has paid the lifetime membership fee. CI has no way of knowing how many of its members may have lost interest in cryonics.

Still, CI is widely believed to be the second-largest organization, maintaining its relationship with tax-exempt Immortalist Society. Either CryoCare or The American Cryonics Society probably is the third-largest organization. CryoCare is non-profit but not tax-exempt, performing administrative functions only, and subcontracting the hands-on work to BioPreservation (for standby, transport, and perfusion) and CryoSpan (for storage).

Since The American Cryonics

Society no longer deals with Trans Time, it maintains a group of local volunteers who would help with the hands-on work of cryonics, and in addition has service contracts with The Cryonics Institute and CryoSpan. This is the current situation as I write these words early in March, 1999.

During the five years of its existence, CryoCare has had to manage the cryopreservation of only two people. One became a member a few months before his death, while the other was signed up by her closest relatives a few hours after her death. In addition, two CryoCare members changed their minds and elected not to be frozen (by CryoCare or any other organization) a few weeks before they died.

CryoCare has pursued a deliberate "zero growth" policy for the past two years, since key personnel in its service providers have made it clear that their primary obligation is to perform research for 21st Century Medicine rather than freeze people using imperfect existing technology. This is consistent with the bio-conservative mindset I described above, and as I noted in my previous column, the research has been successful beyond anyone's expectations, developing techniques that should revolutionize cryonics protocol. The question is: Who will *apply* this new technology out in the field?

In 1998, at Alcor, Fred and Linda Chamberlain proposed creating (yet another) new company: BioTransport, which would license new technology from 21st Century Medicine or any other affordable, reputable source, and would provide standby/transport/perfusion services to other cryonics groups, including Alcor and CryoCare. At CryoCare, once again we were excited by the prospect of a

free market among service providers. Unfortunately, disputes about the policy and bylaws of BioTransport began almost as soon as the idea of the company was announced. Principals at CryoCare and 21st Century Medicine believed very strongly that the new company should undertake an immediate fund-raising initiative, so that it could employ trained medical personnel to implement new technologies, some of which might be demanding and complex. At Alcor, however, the first priority seemed to be a grass-roots network of volunteers to implement cryonics services in the current, simpler form. Once again the techno-radicals (who seemed willing to accept the current state-of-the-art in the confident expectation of future progress) were at odds with the bio-conservatives (who still wanted better cryopreservation techniques as Step One).

After unproductive negotiations, CryoCare chose not to participate in the creation of BioTransport. Meanwhile, Linda Chamberlain has followed through with impressive energy, realizing her plans to encourage a whole new wave of volunteers at the local level, for Alcor. BioTransport may not function as a separate entity until much later this year.

Where does this leave us now? Personally, as a bio-conservative, I feel that all cryonics organizations today are severely deficient, including CryoCare, of which I am President. CryoCare still depends entirely on BioPreservation for standby, transport, and perfusion, and no one is happy with this arrangement. Meanwhile, I have to note that other cryonics organizations are still using techniques which, at best, closely resemble the protocol developed by Darwin and Leaf in the early 1980s,

and at worst are much more rudimentary, lacking elementary controls and monitoring equipment. Does this matter? That depends whether you happen to be a techno-radical or a bio-conservative.

On the upside, when I look back at the split between Alcor and CryoCare, I see that both sides succeeded in their goals. Alcor relocated in Arizona after a meticulously managed moving operation, and none of the grim prophecies from naysayers came true. Alcor has continued to acquire new members, and has provided basic training to many volunteers, who remain vital so long as no one can afford to pay a team composed entirely of medical professionals. On the other hand, CryoCare established what I believe is a very wise system of unbundled services, even though it is still premature; and many of CryoCare's most knowledgeable members dedicated themselves to research, achieving remarkable results that could potentially resolve most of the worries and uncertainties that afflicted bio-conservatives in the past.

Looking at this situation, an outsider might say, "Why don't you

guys get together? At Alcor, you have people who actively want to do the job of cryonics, but you don't have ice blockers and other innovations being developed by 21st Century Medicine. At CryoCare, you have a service provider who is reluctant to provide cryonics services and would rather do research instead—but you have access to all the new technology. Sounds like an obvious opportunity for a merger that would combine the strengths of both sides, and benefit everyone."

Indeed, it does sound like that. Alas, the differing priorities which caused the Alcor/CryoCare split still exist. I still see a more expansionist, optimistic mindset at Alcor, coupled with a greater belief in the future potential of nanotechnology. I still see caution and skepticism among many CryoCare principals, and a belief that research remains the most urgent need, so that we can learn how to prevent damage now rather than trust that it can be fixed later.

Since I hold this latter viewpoint myself, I may not be assessing the situation objectively, and may not have described it fairly here. However, a look at publications produced

by Alcor and CryoCare tends to validate my viewpoint. *The Alcor Phoenix* is unfailingly upbeat, a true exercise in positivism, often focusing on the delivery of basic service via regional volunteers. *CryoCare Update* (circulated only to CryoCare members) is more likely to discuss current problems, and often its primary focus has been research.

So, here is my final explanation when anyone asks why we have multiple organizations in a very small field. *Not all cryonicists think alike.* Their priorities differ greatly, and bitter experience has shown that compromise can be difficult or impossible. When the factions try to coexist, they may create strife that wastes everyone's time.

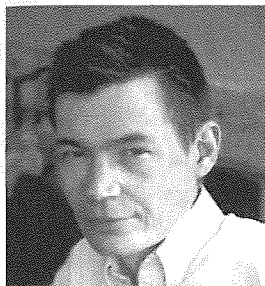
I have to conclude that for the immediate future, we may be happier and more productive if we continue to operate in our myriad separate organizations—even though personally I would prefer to see more cooperation in this field.



Note: The history of cryonics organizations, above, was simplified for space reasons. Thanks to Jim Yount of The American Cryonics Society, and Robert Ettinger of The Cryonics Institute, for factual corrections. In addition Mr. Ettinger made the following observation:

"As to the merits of Platt's other opinions, I will merely suggest that anyone with a serious interest should study *all* of the organizations' web sites *very* carefully (you can't do it in one day or in one week!) and if possible visit the facilities, and if necessary follow up those due-diligence efforts with further questions and investigations."

I don't know if Mr. Ettinger is suggesting that this kind of study would invalidate or contradict my views, which he seems to disagree with. But of course anyone with a serious interest in cryonics should gather as much information from as many sources as possible.



Dick Jones

by R. Michael Perry, Ph.D.

The question often has come up whether anybody famous has been frozen, “besides Walt Disney.” Unfortunately, Disney *wasn’t* frozen. (According to records, he was cremated.) So you are left wondering whether anybody famous *at all* has been frozen. And for over 10 years now the best answer has been that TV producer and script writer Dick Jones, who used the stage name Dick Clair, is the *most* famous person to have been suspended to date. Jones/Clair is not really *famous*—few have heard of him, but he did have a highly successful career, winning several Emmy Awards. In addition he was a staunch supporter of cryonics and in his later years, Alcor, which is now his resting place. Here, as usual, I’ll only be able to skim some highlights of his story, with emphasis on the small cryonics movement he was devoted to.

Richard Clair Jones was born in San Francisco in 1931, and came from a Catholic background, though in adult life he was not strongly religious. He served in the military for two years, 1955-57, and by the early ’60s was active in his chosen profession, entertainment. He and his partner, Jenna McMahon, performed dozens of husband-and-wife comedy skits on the Ed Sullivan show and other television programs, but his greatest success was in writing scripts and producing shows. The comedy team of Clair and McMahon won three Emmys for the Carol Burnett show and created the TV sitcoms “Facts of Life,” “It’s a Living,”

“Mama’s Family,” and “Flo.”

Jones’ involvement in cryonics started early, around 1965, when he read *The Prospect of Immortality* by Robert Ettinger. Years later when McMahon, a non-cryonicist, was locked in an unhappy legal struggle with Alcor over the Jones considerable estate and not inclined to be over-sympathetic, she talked to a reporter about Jones’ motives. “Dick just had a morbid, morbid fear of dying. He wouldn’t even talk about anybody that died. The fear was so great that when *The Prospect of Immortality* came out, Dick went overboard with it. He just grabbed at that one hope.”

A more positive assessment of cryonics by Jones himself was offered in an early newsletter, *Cryonics Reports of California* (dated January 1967, though actually printed about a month before). Jones by then was Corresponding Secretary of the newly-formed Cryonics of California (soon to be reorganized as Cryonics Society of California or CSC), a group headed by Robert Nelson. At this point the first “real” cryonic suspension, that of James Bedford, had not yet happened, but a woman kept in a mortuary for several weeks in Arizona had been frozen in April 1966. The freezing idea had also received widespread publicity follow-



Dick Jones and Jenna McMahon in a TV comedy routine, early 1970s.

ing publication of *The Prospect of Immortality* by Robert Ettinger in 1964. A *Time* article in September 1966 addressed some religious questions raised by human freezing, and reported the misgivings of two prominent theologians. Jones responded with a sound rebuttal to these naysayers which, though ignored by *Time*, was excerpted in the cryonics newsletter (see accompanying box). It shows the absurdity of "moral" arguments against the freezing program, and also indicates something of the excitement that the new movement was generating in its advocates.

Unfortunately, the fortunes of CSC went downhill, culminating, in 1981, in a notorious court case. Nelson and an assistant were ordered to pay nearly a million dollars in damages because his patients, stored in a cemetery vault in the Los Angeles suburb of Chatsworth, had not been kept frozen. Jones meanwhile had quit CSC but had not lost interest, becoming a member of Alcor in 1979. (Alcor at this time was located in southern California near CSC, and had been founded in 1972 by Fred and Linda Chamberlain when they broke with Nelson's group.) In 1982 there was a major crisis involving another organization, Trans Time, headquartered in the Bay Area in northern California. A man had been frozen in 1974; his wife followed in 1978. Funds for their maintenance in liquid nitrogen were to be provided by their son, but he was killed in an automobile accident (and not frozen). By 1982 the situation had become desperate. The two might have been thawed for lack of support, but Jones came to the rescue, contributing nearly \$20,000 to save the suspensions, which continue today.

Over the next few years he took an active part in Alcor's affairs. Mike Darwin would comment in a 1989 article, "Most of us knew Dick very well. He was a regular at Alcor social gatherings and he was a close personal friend to a fair number of the Alcor directors, officers, and members. He was a stalwart backer of Alcor and gave generously of



Alcor meeting, Sep. 1983, held at the home of Paul and Maureen Genteman. Left to right: Bernie Krakower, Bill Jameson, Dick Jones, and Mike Darwin.

his money, his time, and his reputation. He opened his home to our holiday gatherings and he opened his heart to suspension patients in need." One of Jones's contributions was a flyer used in Alcor's promotional literature. It projects a good-humored optimism about cryonics, though recognizing the lack of a guarantee of success. "Even if the odds are a billion to one against surviving suspension," Jones advises, "that's better than no odds. So fasten your seatbelts, floss your teeth, eat fresh veggies, exercise and sign up for suspension. With a little luck all the time in the world may be just around the corner."

Ironically, time was running short for Dick himself. Diagnosed with AIDS in 1986, his condition began to worsen rapidly in the summer of 1988, and soon developed into the nightmare of a brain disease. AIDS, of course, does not kill you directly, but instead cripples your immune system so that "opportunistic infections" and the like, which your body could normally resist, instead finish you off. In Dick's case the lethal agent was *toxoplasmosis gondii*, a protozoan infection which invaded his brain and left him in a confused, progressively

worsening mental state for some 12 weeks before he succumbed.

Aside from the immediate health crisis, there were other complications. Since Dick was to be suspended, cooperation from his hospital was critical. A prompt pronouncement of death, as soon as heartbeat and breathing had ceased, was needed so the suspension procedure could be started as soon as possible. Prompt release of the body to Alcor after pronouncement would also be required. But Sherman Oaks Community Hospital, where Dick was being treated, refused both requests, citing instead a recent memo from David Mitchell, Chief of the California Office of State Registrar. "Existing California statutes provide no basis to authorize cryonic facilities to store human remains," Mitchell coldly advised. "Therefore, if the ALCOR Foundation has any bodies or body parts stored in the facility, the Foundation is guilty of a misdemeanor (Health and Safety Code Section 7054) and should be reported to the local District Attorney for investigation and prosecution as appropriate."

A court battle erupted: the *Roe v. Mitchell* case, with "John Roe" (Dick Jones) and Alcor as plaintiffs seeking

Dick Jones Answers *TIME Magazine*

[from *Cryonics Reports of California* (Jan. 1967) 3-5]

In a recent *TIME Magazine* article on cryogenic interment, a great deal of space was devoted to the theological considerations. Dick Jones, our Corresponding Secretary, offers a rebuttal to those considerations in a letter he wrote to the editors of *TIME*, the major portion of which is reprinted here:

"What concerns [John] Macquarrie[, professor of systematic theology at Manhattan Union Theological Seminary,] are the moral problems that reanimation poses, such as the overpopulation of the world.

"What is the difference between this and a proposal to murder people? He even uses the word *reanimation*, implying he believes either

1) the person is revived from the dead, or

2) the person wasn't dead in the first place.

"If he means the second, he is advocating killing the person—there is simply no way around that conclusion. If he means the first, he's crazy. It's impossible. Dead is dead.

"One has the urge to say to Macquarrie: why not wait? If things are too crowded for you then, kill yourself.

"And if you refuse to get frozen *now*, you won't be around *then*, so why don't you just maintain silence and let those of us who are *trying to get there* handle the problem?

"To Theologian Joseph Sitler of the University of Chicago Divinity School, reanimation of human beings after years in a freezer

sounds like an 'exalted form of madness,' based on a dangerous and 'radically nonhistoric concept of what a human life is.' Man, says Sitler, is a 'profoundly historical being,' and to extract him from his historical setting is to destroy him. Reanimation could bring living death to man, not salvation from oblivion.

"He calls it a 'form of madness,' but evidently he believes it possible—he thinks it 'mad' not because of scientific objections to freezing and thawing, but because the thawed person won't be happy when he comes to. So the man is recommending letting people die so that they won't have to face an unpleasant life. Isn't this euthanasia? How does he *know* about the future? He says, 'sounds like—' To which one wants to reply: Oh, well, then, Sitler, in that case pardon me—if it doesn't *sound* right to you, I'll be glad to lie down and die. Yes, it is a 'radically nonhistoric concept,'—you're right—we're talking about immortality, you see. Hasn't happened before. Glad you caught that.

"First of all, who says that to extract a man from his historical setting is to destroy him? Maybe it'll be joyous to wake up in the future. Maybe the future *is* his historical setting! Maybe he's been *prevented* from being in his historical setting up to now. And why is freezing 'extracting' him? Yes, he may be in a coma for many years, but he still exists—he still *lives*, he has merely been suspended. If a man goes into a coma for ten years because of an accident, but doesn't die, has he been 'extracted from his historical setting'? If he revives, does the government execute him on the basis that he has been destroyed al-

ready anyway? No, obviously that's absurd. So ten years in a coma is all right. What about twenty? Fifty? A hundred? Is a hundred years in a coma too long? Must such a man, if still alive, be killed? If it *is* too long, what is the exact amount of years between fifty and a hundred in which a man, if comatose or dormant, becomes 'extracted' from his historical setting? 79, perhaps? Or 81?

"And let us say you're right after all, Mr. Sitler—a man is frozen—hundreds of years later he is reanimated (not resurrected)—Should he have been killed in the past? Should he be killed in the future? If so, shouldn't suicide be legal today? Shouldn't wretchedly unhappy people be allowed to die?

"It would seem that a more prudent course than to condemn the freezing program out of hand might be merely to wait and see. If our hypothetical man hates the future, he can kill himself *then*. (Or *you* can [kill him], Mr. Sitler, if you have been frozen and reanimated, and perceive that he is maladjusted.) There is no essential difference between being suspended at cryogenic temperatures for hundreds of years, and being under anesthesia (e.g.) during an operation. Mr. Sitler, then, is setting our limits of life, and allowing length of time to be the deciding factor.

"And what if I *want* to exist in the future?"

Dick Jones

the right of persons to be cryonically suspended in California. The case would drag on for years. Finally it would be settled in Alcor's and Jones's favor, to the great relief of the cryonics community, for the case had broad implications for cryonics organizations and cryonic suspensions within the state and across the U.S.

But there was still the more immediate problem of the hospital's refusal of Alcor's requests, which couldn't wait for the slow progress of *Roe v. Mitchell*. Instead, a court order had to be obtained, and fast.

It was a tough fight, with the hospital contesting every step of the way. The hard-driving efforts of Saul Kent, Jerry Leaf, and Alcor's legal staff showed even more determination. Alcor had 150 pages of documents supporting its side of the case; the hospital had 13 pages plus the state-published manual for hospital operations. Thankfully, the cryonicists' extra efforts paid off. A temporary restraining order was handed down Oct. 14 in Los Angeles Superior Court. The hospital was required to release the patient to Alcor following pronouncement of death, and then allow use of the hospital premises so that Alcor's suspension team could begin the preliminary cooling steps. During this procedure a heart-lung resuscitator would be used to oxygenate the tissues and maintain cell viability as far as possible.

Even then the matter wasn't settled. Three days after the court ruling, Jerry Leaf was checking with the hospital staff to make sure that Alcor's suspension equipment would meet their approval, and a problem arose: Alcor's two heart-lung resuscitators, one of which would be used in the suspension, were not approved by Underwriter's Laboratory or the FDA. On these grounds, the hospital still refused to cooperate. Alcor threatened to go to court again, noting that the units were powered not by electricity but compressed oxygen gas, thus outside the authority of the UL. As for the FDA, its jurisdiction did not extend to people who were legally dead, as

Jones would be when the suspension started!

Finally the hospital gave in and withdrew its objections. The Jones suspension followed less than two months later, on Dec. 12, 1988.

Dick was perfused and cooled using the best techniques then available, and has rested quietly in liquid nitrogen since. But the rather routine freezing, and the successful conclusion of the case against Mitchell in 1992, were far from the end of the matter, for there was still the disposition of the Jones estate. Worth an estimated \$5 million, most of it had been willed to Alcor in 1987, when Dick had been fully competent and aware of his situation. (The value of the estate could not be accurately determined because much of it didn't exist at the time, depending instead on reruns from TV shows Jones had scripted. A more realistic, retrospective estimate by Carlos Mondragón in March 1999 placed the value at \$2.5 million.) Dick had never married and had no children. He had only had infrequent contact over the years with his closest living relative, a sister. Outside his profession, his enduring interests were cryonics and how to see that he would be frozen and, moreover, *kept* frozen, in the face of difficulties he understood very well. Lack of funds to keep people frozen had been a major factor in the Chatsworth disaster, and Dick didn't want any repeats of this sad event for himself or others. He wanted to strengthen his cryonics organization, and provide for a research program, as well as maintaining the patients in storage.

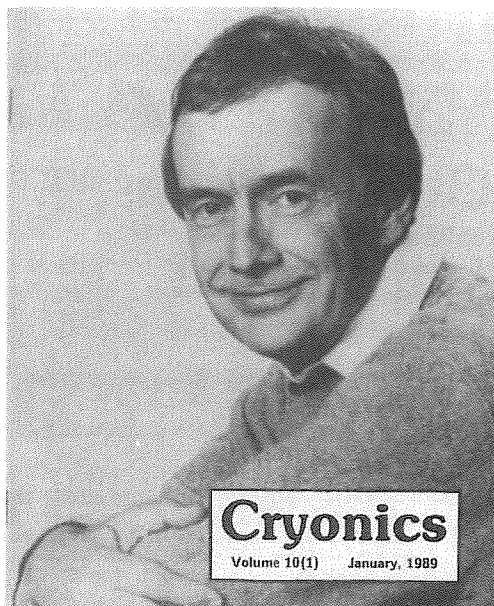
But in the fall of 1988, as Dick's mind weakened in the grip of his final illness, others were scheming to divert his estate to their own purposes, taking advantage of his disorientation and his basic, abiding desire to please everyone. Dick had earlier provided that his sister would receive approximately \$200,000, which was the amount he had inherited himself from his parents. But, though the sister and other relatives weren't particularly hurting for funds, this was

no longer enough for them. On Dec. 9, just 56 hours before he died, the very sick, bedridden patient was persuaded to sign a new will. A substantial additional amount of the estate, roughly half of the \$2.5 million, would now be diverted from Alcor to the sister, other relatives, and, it would turn out, court costs that Alcor must agree to pay. Control of Dick's remains was reassigned to his business partner, Jenna, who also replaced Saul Kent as the new executor of the estate.

Contested in court, the new will was upheld despite impressive medical and legal testimony calling into question the mental state of the patient so shortly before dying of brain infection. The defense counsel's assemblage of "lay witnesses" claimed that Dick had experienced a "window of lucidity" in his last moments, and the judge apparently found their testimony persuasive. Another major factor was Dick's physician, Dr. Anthony Scarsella, who had at first written an opinion that Dick was "in no condition to comprehend any kind of legal document" on the day the will was signed. Soon afterward, Dr. Scarsella declared he had no knowledge and could not render an opinion of Dick's mental condition when the signing took place, apparently yielding to pressure from the family. Later still he had apparently forgotten entirely about Dick's mental state and would offer no opinion whatever.

Despite the generally unfavorable court decision, however, Alcor did recover control of the patient, and did receive a substantial bequest that helped it considerably in the years to come. (In spite of this, though, there was a major shortfall. Alcor's research in the 1990s has proceeded at only a very slow, unsteady trickle, in large part for a lack of funds that the Jones estate could have provided.)

Dick Jones, a shy, retiring, kindly, and highly talented man, made several important contributions to cryonics over the two-plus decades of his activity. But his greatest contribution, I think, was his involvement in the Mitchell case. The



Dick Jones on the cover of *Cryonics*, Jan. 1989.

efforts of the Department of Health Services to have cryonics declared illegal were perhaps the biggest threat that the movement has ever faced. We won that battle and are still here. Although the credit does not rest with just one individual, the role of Dick Jones was very substantial, since he supported the action both financially and in personally providing a test case. (This contribution was not negated by the fact that Jenna McMahon, as the new executrix, pulled the Jones estate out of litigation.) Cryonics could perhaps have continued, even if suppressed in California, but its illegality there would have set a bad precedent elsewhere, and the movement would have suffered a great setback inasmuch as most cryonics activity was in California at that time.

Also noteworthy is the battle over the Dick Jones estate, which came about because Dick's mental deterioration in the last months of his life resulted in compromise of the cryonics arrangements he had already made. This of course could happen to any of us too. Saul Kent made the following recommendations in a (lightly edited) 1989 *Cryonics* article.

1. Hire a doctor you can rely on. One

of the problems Dick Jones had was that his physician had very little backbone under pressure. His only concern was to protect himself, not to serve his patient. The doctor you hire doesn't have to believe in cryonics, but he or she must be honorable and have the strength of character to stand firm in a crisis.

2. Make a videotape when you're healthy and lucid (and update it every year) to make your wishes known. In making this tape, don't just talk about what you want, but also about what you don't want. If there's a relative you think may give you trouble, make sure to state that you do not want this person to have control over your affairs, regardless of the circumstances. A videotape is better evidence than a written document of the fact that you were healthy and lucid when you expressed your wishes.

3. Tell your relatives and associates directly (to their faces) that you intend to be frozen and exactly what you intend to do with your money; and tell them not to interfere with your plans. Dick Jones never was as explicit as he should have been about his wishes with his business partner and his sister.

4. If you execute a Trust to direct the distribution of your assets, make it irrevocable while you are still healthy and lucid. Dick's trust was not irrevocable and it cost him. If you know you're suffering from a terminal disease (as Dick did), this could be crucial.

5. If you don't want to make your trust irrevocable, give as much of your money as you can to your cryonics organization before you lose your health and lucidity.

A closing thought, often expressed before, is that living quarters for cryonicists would be a great idea. Both the wealthy and those of more modest means could benefit. An aging, ailing

cryonicist could be surrounded by others of similar outlook and greater vigor. These healthier cryonicists in turn could be alerted to any special problems the near-term patient might encounter, including persons with documents to sign. Such a facility could also serve as a hospice where deanimation could take place under conditions favorable to a suspension.



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Picture Credits.

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Cover: *Cryonics* 10(1) (Jan 1989).



How Might Cryonics Organizations Help Those Who Want to Join?

by Thomas Donaldson, Ph.D.

I will begin with a platitude: life insurance companies are not really interested in the welfare of their clients, they are interested in making money. One consequence of that interest is that they will refuse life insurance to anyone who shows a significantly higher than normal probability of dying. Such people include those who had a very serious disease in childhood or early adulthood (cancer, *etc.*) or those who suffered a serious accident early in their lives, with consequences from which they still have not recovered.

The most important point for us about such people is that they became uninsurable at a time when they were very unlikely to think seriously about cryonics. We all know that in adolescence and early adulthood many people come close to thinking of themselves as immortal, and the notion of making preparations for cryonic suspension well in advance simply doesn't seem relevant. Most of those youths simply grow out of that attitude and may become recruits later; but some find themselves confronted with their mortality quite early in life.

Some cryonicists will simply shrug, observing, "Yes, there are people who didn't catch on soon enough," and then pass on to some other subject. However, we also have

here a pool of potential members, well aware of the merits of cryonics, who find themselves quite unable to fund their suspensions with life insurance. (I am not referring here to those who die at an early age, but to those who manage to recover from their illness but find that despite their recovery, suspension funding such as insurance will not work for them.)

Some groups now have standards for *trusts*, making them acceptable sources of funding. This is a valuable first step, but *only* a first step. How can cryonics organizations give those ineligible for life insurance a chance to become Suspension Members, while at the same time not creating further danger for present members already suspended or those currently Suspension Members? Here are some further possible steps to help recruit such members. I'm not claiming that they would necessarily work. I am only raising some possibilities:

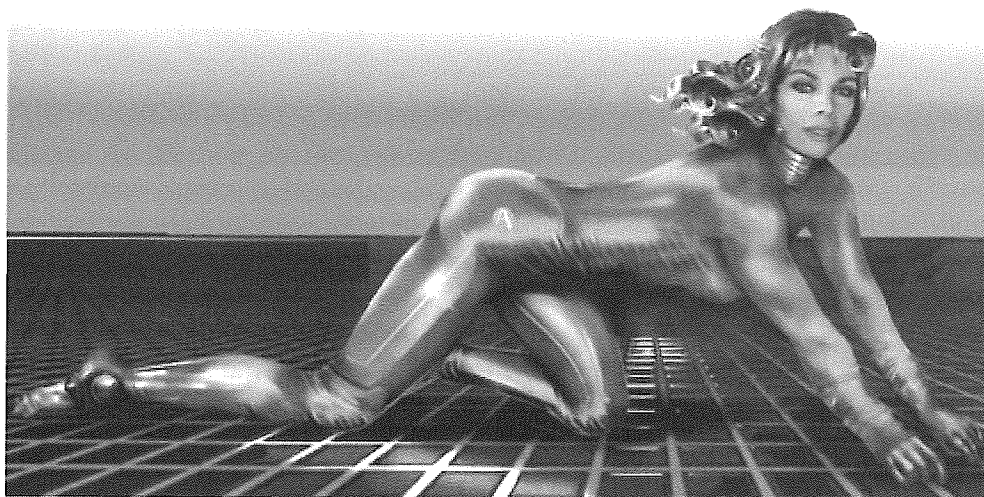
1) Suppose first that a potential member owns shares in a variety of companies. The problem with shares is that they can also go down in price rather than up. At the same time, whenever shares have a price at all, both sellers *and* buyers exist. Cryonics organizations might help here by finding other members who would be

interested in buying those shares, if a candidate needed suspension, at a price to be agreed beforehand. Yes, that price might be less than the market price at the time the member needed suspension, but such an arrangement would both protect the cryonics organization and make the funding of a member much stronger than otherwise. The organization itself need not have any direct role in such a deal, but simply help facilitate it between a candidate member and someone who is already a Suspension Member. Again, treasury bills and other such investments might be part of such a deal. In this case, the discount given to a buyer would not be as great, but still enough to make it worthwhile for the buyer. I will emphasize here, too, that the amounts offered must always remain large enough to pay for a candidate's suspension and any other medical bills involved.

2) Real estate, particularly the home in which a candidate may currently be living, provides special problems. A candidate member here might offer to sell his home *before* his/her death, while at the same time retaining the right to live in it. Such a set-up has many variations: the buyer may be required, for instance, to pay a substantial fraction of the value of

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"speculative advertisement" by Natasha Vita-More

the house at the time of the seller's death, or a special loan, to be repaid by ownership of the house, might be set up so that the money required for suspension became immediately available when the candidate needed suspension. If a candidate owns other property, some of the same ideas might still work. However that other property, as an investment, resembles investments in shares or treasury bills, so that much of what I've said about these investments also holds for it.

It's also worth pointing out here that there are no obstacles to keeping the names of the seller and the buyer here confidential.

3) Finally we come to the hardest issue of all: the possibility that a candidate member may simply not have sufficient property to pay for his suspension. I will not suggest making such candidates the object of char-

ity, because charity funding seems quite unstable. Just how many people could expect to be suspended out of charity by contributions from other members who hardly know even their names? However, such candidates, *given* that they have survived whatever disease or accident made them ineligible for insurance, might also work for a cryonics organization in various ways ... with sufficient work awarded by a free suspension.

Just what kind of work would depend on the candidate. It certainly doesn't follow that those who survive a serious illness (or accident) in their youth become ever afterward unable to do any kind of work. Such candidates might well have to move their residence, and they would have to perform *real* work, not make-work. The most essential part of such an arrangement would be the cryonics organization's agreement, *in advance*, that after working for a given

time, the member would receive a free suspension.

I would like to emphasize here that such arrangements pertain not just to membership candidates requiring special funding methods to join, but also to *every* cryonicist. We all have made our own financial arrangements to pay for our suspension, particularly with life insurance. But just like any other business, life insurance companies can fail or be taken over by another, which then turns around and offers much less favorable arrangements to pre-existing clients. We *all* have the risk of needing funding after we discover that our previous arrangements, so carefully planned, turn out not to work.



**HEALTH,
Healthy Living,
Cooking Light,**

**Diet & Exercise,
Vegetarian Times**

Reviewed by Lisa Shock

As a cryonicist, one of my ongoing interests has been maintaining a healthy lifestyle. I like to keep up with new developments in nutritional science and health care, hoping to delay my suspension as long as possible. Over the past twenty years interest in health and fitness has grown at a phenomenal rate in the US, spawning new industries to feed our ever-growing appetite for healthy lifestyle products. We seem to hear about new breakthroughs daily: snippets on the evening news, a two-inch article in the newspaper, a DJ's joke on the radio, and endless infomercials.

Searching for a good single source of timely information on this topic, I stopped at my local B. Dalton bookstore to see what the magazine rack had to offer the general public.

I found five publications, far fewer than I expected, which primarily covered nutrition or health care:

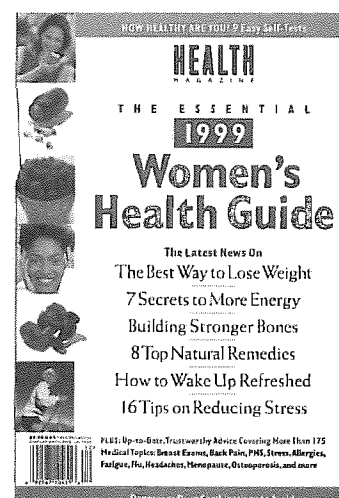
[Editor's Note: Longevity, the Bob Guccione contribution to this subject matter, folded several years ago.]

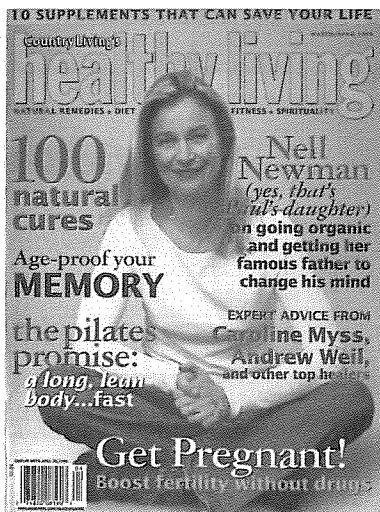
HEALTH, a Time Inc. magazine, combined an interesting assortment of short articles on health, nutrition, cosmetics, and fitness, with longer features on emotional health, cooking, travel, and exercise -- all aimed at a primarily female audience. Readers could have questions answered by Dr. Nancy Snyderman, M.D., or by Barbara Paulsen, editor-in-chief. Most articles cited scientific studies to back up their claims, but the magazine retained a cheerful, accessible attitude, aiming itself at the mainstream American public. Little was mentioned about life-extension supplements or vegetarianism, but overall, I found this magazine to be the best of the five consumer publications available.

HEALTH also published an annual women's health guide, which was available on newsstands during the first quarter of the year. The guide offered fairly basic medical and nutritional advice, but once again ignored life-extension supplements or any mention of vegetarianism. I was also surprised to see several instances

of incorrect advice, which, while not relating to any potentially fatal conditions, did undermine my faith in their fact-checking department. For the most part, the annual guide was a handy reference; just don't look to it for cutting-edge advice about life-extension subjects.

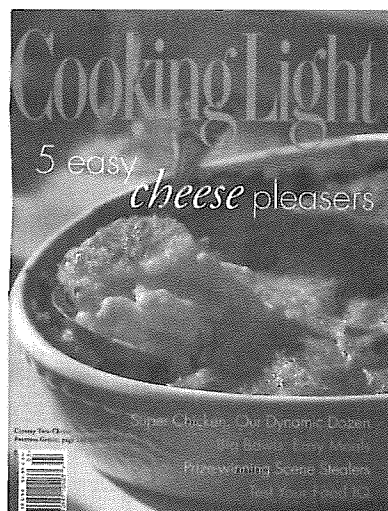
Country Living's *Healthy Living*, from Hearst Magazines, also offered a mixture of news snippets, articles, and advice, all with a decidedly spiritual slant. The advice columnists included T. Michael Culp, N.D., and Caroline Myss, Ph.D., resident psychic. One column featured home remedies sent in by readers with commentary from the column's editor, often endorsing ridiculous and fanciful cures for serious ailments. Writers for this publication seemed to rely on fear and intuition as pri-





mary sources for information, rather than seeking out scientific studies or educated medical advisors. I spotted several instances, in the March/April issue, of incorrect (potentially detrimental) advice being given regarding serious medical conditions, and a general disregard for simple principles of chemistry and physics. I found that this magazine offered little I could recommend to others.

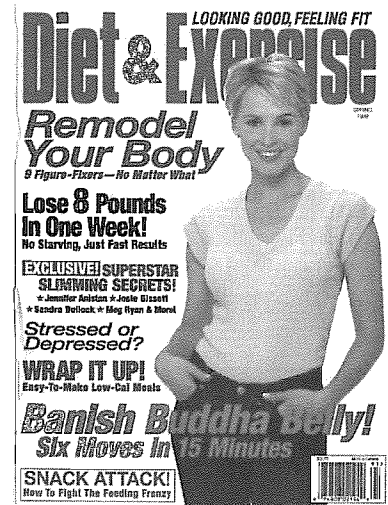
Cooking Light, the magazine of food and fitness, focused (as the name implies) primarily on cooking and nutrition. Short articles on nutritional news, travel, and fitness complemented the longer articles, which focused primarily on cooking. The articles provided accurate information, and most were written



by experienced chefs from health-oriented establishments. The recipes were innovative, interesting, and not too intimidating to prepare. Life-extension supplements were not a topic covered, but vegetarian diets and cooking were well represented. This magazine may not be the best source for health news, but if you're looking for something healthy and exciting for dinner, I recommend you try *Cooking Light*.

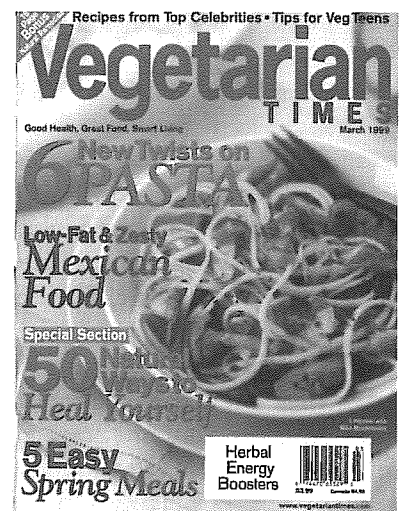
Diet & Exercise used a tabloid approach to cover a variety of weight-loss and exercise programs, with a few articles on health and nutrition. While all of the other magazines reviewed here devoted 30 to 50 percent of their pages to advertising, this publication had almost no advertising at all. The inside pages were printed in black and white on newsprint, which undoubtedly cuts costs. Most of the information provided was adequate, and there was no section for news or life-extension topics. This magazine really focused on providing upbeat diet and workout advice in a fairly simplistic format.

Vegetarian Times, a Primedia Enthusiast Publication, offered health and nutritional information to a readership encompassing a wide variety of nutritional disciplines loosely gathered under the label "vegetarian." Articles covered topics such as travel, medicine, cooking, nutrition, news, exercise, and ethics. (Animal rights issues were mentioned, but not as a primary focus.) Life-extension supplements were covered occasionally, and special diets like Dr. Dean Ornish's low-fat heart-disease reversal diet receive extensive coverage. The cooking articles were written by experts, and generally featured innovative reci-



pes which were easy to prepare (and usually extremely low in fat). If you're curious about what exactly vegetarians eat, or are just looking for some good ideas for a meal or snack, this is a good magazine to try.

Overall, I'm still searching for a good source of nutritional news with life-extension leanings and low-fat recipes. None of the magazines I've found really fit the bill, but I'll be waiting. Maybe someday the major publishers will decide there's a market for such a publication. I just hope they don't take too long!



***Immortality:
How Science is Extending Your
Lifespan -- and Changing the World***

by Ben Bova
Avon Books, 1998.

Reviewed by Steve Bridge

Ben Bova has been a well-regarded writer of science fact and fact-based science fiction since 1950. He predicted the US-Soviet space race in 1950, solar power satellites in 1960, virtual reality in 1961, and so forth. He has always been a calm, careful writer, respected by scientists and science fiction writers alike. So the people that know him may pay attention when he starts out the first chapter of *Immortality*,

"The first immortal human beings are probably living among us today. You might be one of them.

"There are men and women alive today who may well be able to live for centuries, perhaps even extend their life spans indefinitely. For them, death will not be inevitable." (p. 3)

No beating around the bush there. Bova proceeds to give the reader a clear explanation of the current understanding of how cells and humans die, how we age, and how our genes affect aging and death. For much of this he relies on Dr. William S. Clark's insightful book, *Sex and the Origins of Death* (Oxford University Press, 1996). With that as a background, he continues to show how research in gene therapy, cell regeneration, telomeres, human growth hormone, disease prevention, and even molecular engineering will steadily create our abilities to prevent aging, disease, and death.

Bova then answers the expected objections to this research (population, morality, "playing God," the cost) and examines the impact that immortality

would have on human civilization, both positive and negative, and how we might overcome the negative changes. Bova concludes that, no matter what the objections are, the research will continue and will be successful.

"My opinion is that those who want to extend their life spans will win, despite all opposition. The will to live, the fear of death, is enormously more powerful than the doubts and fears of the unknown territory into which this new knowledge will plunge us."

One of Bova's ideas that most impressed me (probably because it is one that I have held for years myself) was his contention that longer life spans are necessary for the human race to mature and use its wisdom. He speculates that the benefits of life extension will far outweigh the harm.

"Today most people hardly ever think about the long-term future. 'Why worry about global warming if it's not going to have any real impact until after I'm dead and gone? Who cares about budget deficits? Or population growth?'"

"The long-term problems of our environment, of our racial relations, of government deficits, of the economic disparities between rich and poor — people who live for many centuries will not be able to ignore them or pass them along to future generations." (p. 241-242)

We as cryonicists — we as humans — need books like this. I know that many of you reading this magazine don't deeply understand the changes that

are occurring. Few of us have the time or the scientific background to read the research papers being published in the fields of life extension and aging. *Immortality* provides an excellent and readable summary for us.

However, a real problem exists: who is going to read this book beyond Bova's friends and family and the people who are already interested in life extension? I suspect that the title itself will literally force most people's eyes away from the cover. The thought of physical immortality is too easy to dismiss as nutty, too scary to contemplate seriously. So, as usual, it is up to us. Buy a copy for your local library. Review it for your local newspaper or persuade them that their own reviewers cannot afford to ignore it. Give copies to your more thoughtful friends and family (the reading level is no more difficult than Ettinger's *The Prospect of Immortality* or Drexler's *Unbounding the Future*). Finally, read it yourself to learn new answers for one question that people may never ask you about cryonics. You might decide to bring up the topic yourself.



The Language Instinct

by Steven Pinker, 1995, Harperperennial Library

How the Mind Works

by Steven Pinker, 1997 W.W. Norton & Company

Reviewed by Thomas Donaldson, PhD

Both of these books say very similar things, though the second one tries to be more general. Any review of them must take into account that Pinker wrote for popular rather than expert consumption. And both books come with much adulation from various workers in the field.

Neither book looks at the guts of how our brain works, either with language or in general. They both are instances of Cognitive Psychology, a field which aims to explore not the actual lower-order mechanics by which our brains work, but rather the algorithms used in processing "knowledge" (*ie.* thought) and dealing with language (*ie.* speaking and, we hope, listening). This aim isn't totally accepted, even by some prominent workers in the field. Paul and Patricia Churchland, for instance, would insist that the algorithms our brains use simply cannot be separated from their structure and composition.

I will state here that I found both books disappointing. To be fair, perhaps I simply wasn't the reader for which they were written.

The first book, *The Language Instinct*, spends lots of time arguing against a notion proposed by B.F. Skinner and others: that experiences play the major role in shaping our abilities, including our ability to speak. To anyone who has looked at current work on brains, it's clear that many brain structures have inherent complex functions, which change comparatively little as a consequence of experience. We even have special brain areas devoted to processing language, both speaking and listening. Those areas occur in every healthy human at approximately the same location in our brains.

However, beyond arguing that such structures exist, Pinker falls down badly when he tries to discuss how they might work. Fundamentally he says very little. We seem to have processes which allow us to acquire both vocabulary and grammar. About the exact nature of such processes he has almost nothing worthwhile to say. Basically he adopts ideas from Chomsky*: our language areas work by somehow translating the outer language we use daily (English, Urdu, Sioux, or whatever) into a standard internal language. This tells the reader exactly nothing — it only puts the question back a step, to the problem of understanding how this "standard internal language" might work. Unfortunately, this topic is not discussed.

Pinker also spends some time discussing the various experiments with chimpanzees, whose authors suggest that chimps too can learn language, if in a very primitive fashion. (It is interesting to note that recent experiments show chimpanzees and other primates have language areas in their brains similar to humans, though much smaller and less active). Basically Pinker argues that chimpanzees never learn grammar, but can learn vocabulary. The human "language instinct" seems to have come into existence with no lesser versions in other creatures.

How The Mind Works improves a good deal on *The Language Instinct*. Among other

features, Pinker begins this book with a description of how much we do *not* know, even though we are moving toward knowledge. His discussion of what we *do* know therefore looks much more even-handed. One of the best chapters in the book, Chapter 4, "The Mind's Eye," is Pinker's discussion of the various algorithms we use to see. A second good chapter, Chapter 6, "Hotheads," discusses emotions and our expression of them.

Chapter 5, however, left many questions in my mind. Basically Pinker argues against Piaget, who believed that many of our mental abilities arrive years after birth. Pinker cites various experiments suggesting that traits such as the notion of objects and how they would stick together can be found in babies only a few months old. My problem with these experiments is that his discussion fails to consider the experiments of Piaget also. Just how their different conclusions might be reconciled remains an open question. Moreover, there need be no issue here about whether these abilities are innate or learned features of our minds: there's no special reason why normal brain development must finish only a few months after birth.

Chapter 2, "Thinking Machines," falls down badly, mainly because it adopts the standard Turing definition of thinking. The

* To be fair, he believes not in a full-blown "internal language," but instead in an internal *grammar*. This remains just as useless as if we assume an entire internal language.

original Turing idea of how to distinguish or define a thinking person or machine consisted of a purely linguistic (*ie.* symbolic) experiment: a human interrogator was supposed to present a hidden human or machine with various questions or statements, and receive answers in return. This formulation suffers from a flaw to which many still remain blind: it deals *only* with a world of symbols. At no time do we present this hidden being with a real object, such as a real tiger, pacing in its cage, and ask what it might be. As I understand the classic setup, we don't even present that hidden being with a *photograph* of a tiger.

As it stands, the Turing test makes a *big* empirical assumption: that we can derive one and only one identification of a word for a real-world object solely from the interrelations between all the many words in a language. If this *were* true, then a purely sym-

bolic test would work (though it would leave open the question of just how our brain made this identification). Moreover, this identification must work with even truncated levels of learning: we are testing whether or not a *human* is answering our questions, not whether or not an accomplished zoologist is doing so. As an empirical assumption, it's far from clear to me that this idea is valid. (Yes, this problem is at the root of the philosopher Searle's objection to the Turing test).

Just as in his previous book, Pinker tends to joke about ideas with which he disagrees, rather than think carefully about just what they might mean. And yes, many of Pinker's jokes are genuinely funny. Yet no number of jokes really settles the questions raised by some of these ideas.

The arguments Pinker makes in *The Language Instinct* aim to demolish a belief

which most scientists abandoned years ago. His second book, *How The Mind Works*, does the same, but more generally. Even the better chapters point towards conclusions which serious students of the brain will find both unsurprising and incomplete. Books about the function of our brains (and minds) should discuss the positive conclusions of present studies, and describe what remains unknown.

Unfortunately, Pinker's books fail to do that.

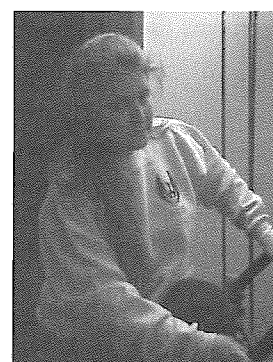


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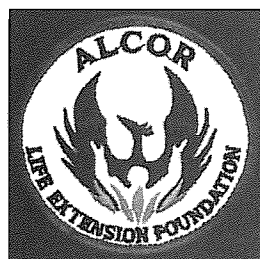


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The Spike: Accelerating into the Unimaginable Future.

by Damien Broderick

Reed Books, Kew, Victoria, Australia 1997.

Reviewed by R. Michael Perry, PhD

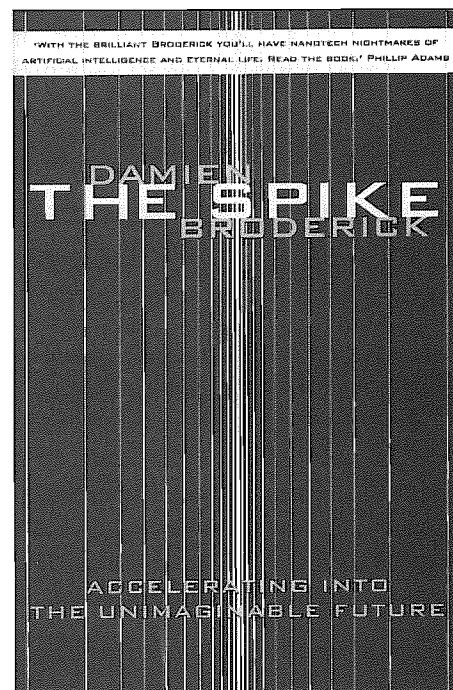
"It rushes at you, the future. "Usually we don't notice that. We are unaware of its gallop. Time might not be a rushing black wall coming at us from the future, but by God that's how it looks when you stare unflinchingly at the year 2050 and beyond, at the strange creatures on the near horizon of time (our own grandchildren, or even ourselves, technologically preserved and enhanced), at what we should probably call 'transhumans' or even 'posthumans'."

So opens Chapter 1 of *The Spike*, and the rest of the book will not disappoint the serious futurist. It is a refreshing if speculative look at what we may hope will happen reasonably soon, as we push our technology toward whatever seems best for us. The style is vigorous and witty, which lightens the otherwise rather sober subject matter and makes it fun.

As for cryonics, it's there too, presented in a favorable and somewhat detailed light, with some of the principal players named and introduced. The prospects for reanimating the currently frozen through future nanotechnology are noted (particularly for the head-only cases or "neuros" who'll need new bodies made by devices able to build human parts from scratch). The book isn't mainly about cryonics however (few even of the most futuristic books are) but, as the title suggests, about a coming Singularity or "Spike." This means basically that our advancement, measured by reasonable yardsticks, goes off

the charts and much about the nature of life after that is really beyond us today—we just can't imagine it. But among other things, it means we'll become something more than human, with old limitations such as death and even the need for employment (as we now understand it) no longer in the rulebooks. Handled properly, it should be a happy state, good enough that no one will seriously want to go back. Best of all, it is coming relatively soon on the scale of human history, and it *may* happen in time to save many of us living today. (But this is a big unknown. Making cryonics arrangements is a useful personal strategy to help ensure that you are around when the Spike does come along. This point of view isn't really endorsed by Damien Broderick — who clearly isn't a cryonicist himself — but it is noted.)

One thing particularly refreshing about *The Spike* is its author's attitude toward radically improving the human organism. Broderick is not the least worried about making the attempt. "Despite the beautiful patterns of life, evolution has no plan. It is a gigantic, stupid lottery. ... In such a universe we are freed from fears of impiety. Since evolution does not have a plan for us, we may choose one for ourselves. In fact that is what we have always done, whether we knew it or not." He notes how his asthma drugs have, over a quarter-century, "improved my life beyond recognition," and is positive about vying for bigger prizes. "So defeating



death need be no more absurd a goal than finding remedies for short-sightedness, asthma ... or, say, the lack of an ability to read and write at birth, or fly a jet by instinct."

Technology meanwhile is progressing fast, which makes the prospect of near-term transhumanity a realistic one that we need to be thinking about. Among the interesting evidence cited is the well-known Moore's Law, familiar to the computer industry, in which the number of components on an integrated circuit doubles roughly every 18 months, as has occurred for many years. At this rate, after a few more decades we'll be down to atomic dimensions and into a world of computational

nanotechnology. Broderick acknowledges that this is not a foregone conclusion, of course, but there is also no end in sight to such steady progress and thus, despite some nay-sayers, we have every reason to project the trend into a significant portion of the future.

Simultaneously, other fields of technology are showing similar progress. Broderick notes rapid and astonishing development in such diverse areas as bioengineering, artificial intelligence, and technological miniaturization outside the computer field. Great promise is seen in general for molecular nanotechnology (MNT)—which Broderick rechristens as “minting.”

Could the Spike still be all a dream or delusion? Are we doomed to remain merely human — or degenerate below human — forever? As Broderick notes, “The unreliability of trends is due precisely to relentless, unpredictable change, which makes the future interesting but also renders it opaque.” He considers this problem at some length. Certainly the trend lines and other hopeful signs might indeed be nothing but

cruel bogosities, fostering false impressions and vain hopes. But still, there are just too many indicators that something *big* is afoot; a Spike really seems to be coming, whether we are ready or not.

So what is going to happen after that? Broderick, who spent some time interviewing extropians and other futurists, foresees such possibilities as uploading ourselves into computational devices, which of course must be advanced far beyond any computer we now have. The person could then be “run” as a program, much as we do with our software today. There might then be a blurring of personal boundaries as it becomes possible to transmit personal experiences between individuals much as computers or programs now exchange data. “Personal identity, always moot for post-Spike beings, will perhaps vanish altogether, as the physical locus of memories fades forever from importance.”

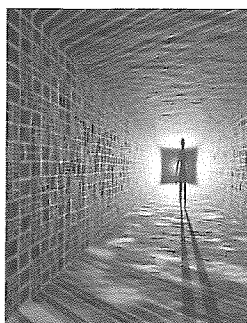
As for this reviewer, I have a higher regard for personal identity and don’t think it will be “moot” even when we

can upload ourselves or find other means to exchange our deepest thoughts and feelings in perfect, digital form. But how it will be in that more distant, presumably happy era, we’ll just have to find out firsthand. A book like *The Spike* will inspire some confidence that our deliverance — from the present world of death, taxes, and stupidity — is nearly at hand. But it may also foster overconfidence that this deliverance will happen more or less automatically, so that we need do nothing more than watch our TVs and, when the requisite breakthroughs are announced, proceed to our local immortalization clinic.

I don’t believe long-term survival is going to be that simple, at least for many of us hopefuls. Which again is why I recommend cryonics.



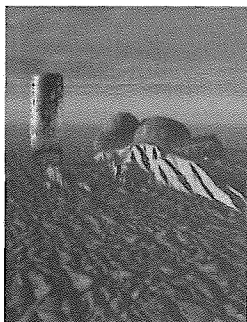
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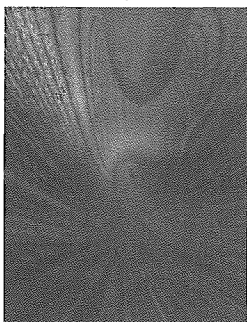
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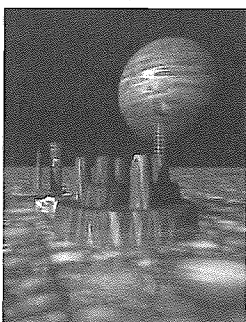
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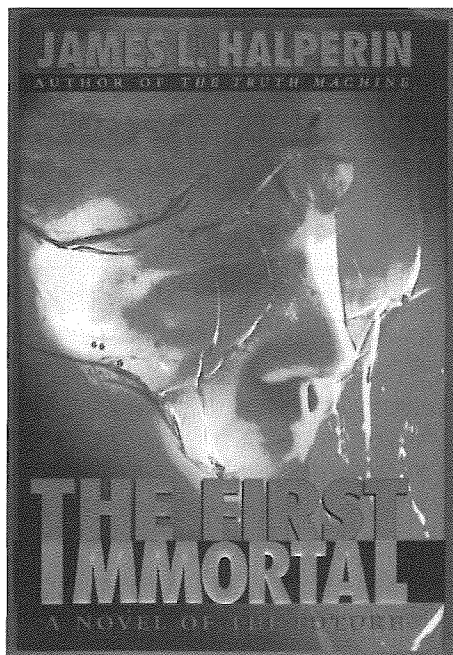
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CALIFORNIA

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Alcor Southern California Meetings

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San Diego Area:

Alcor Meetings

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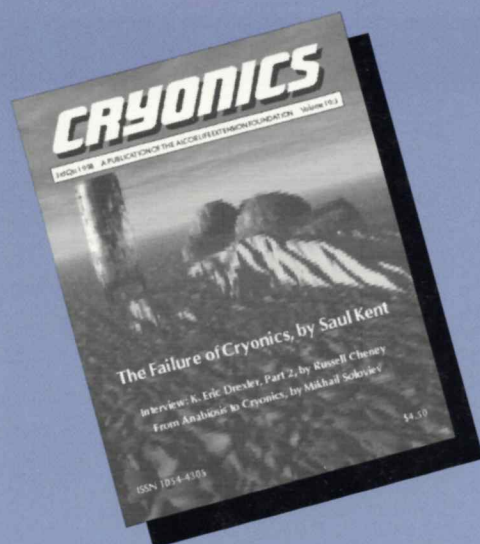
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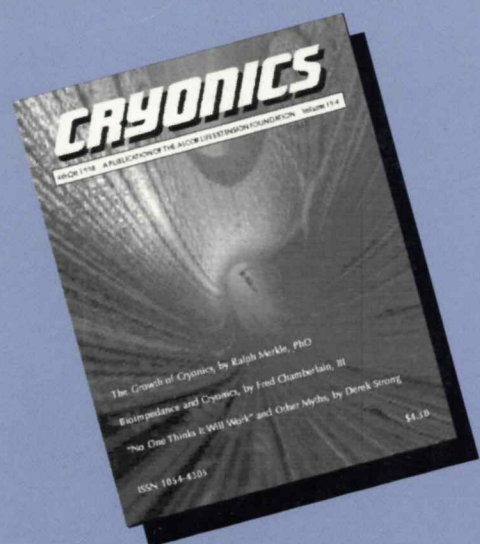


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