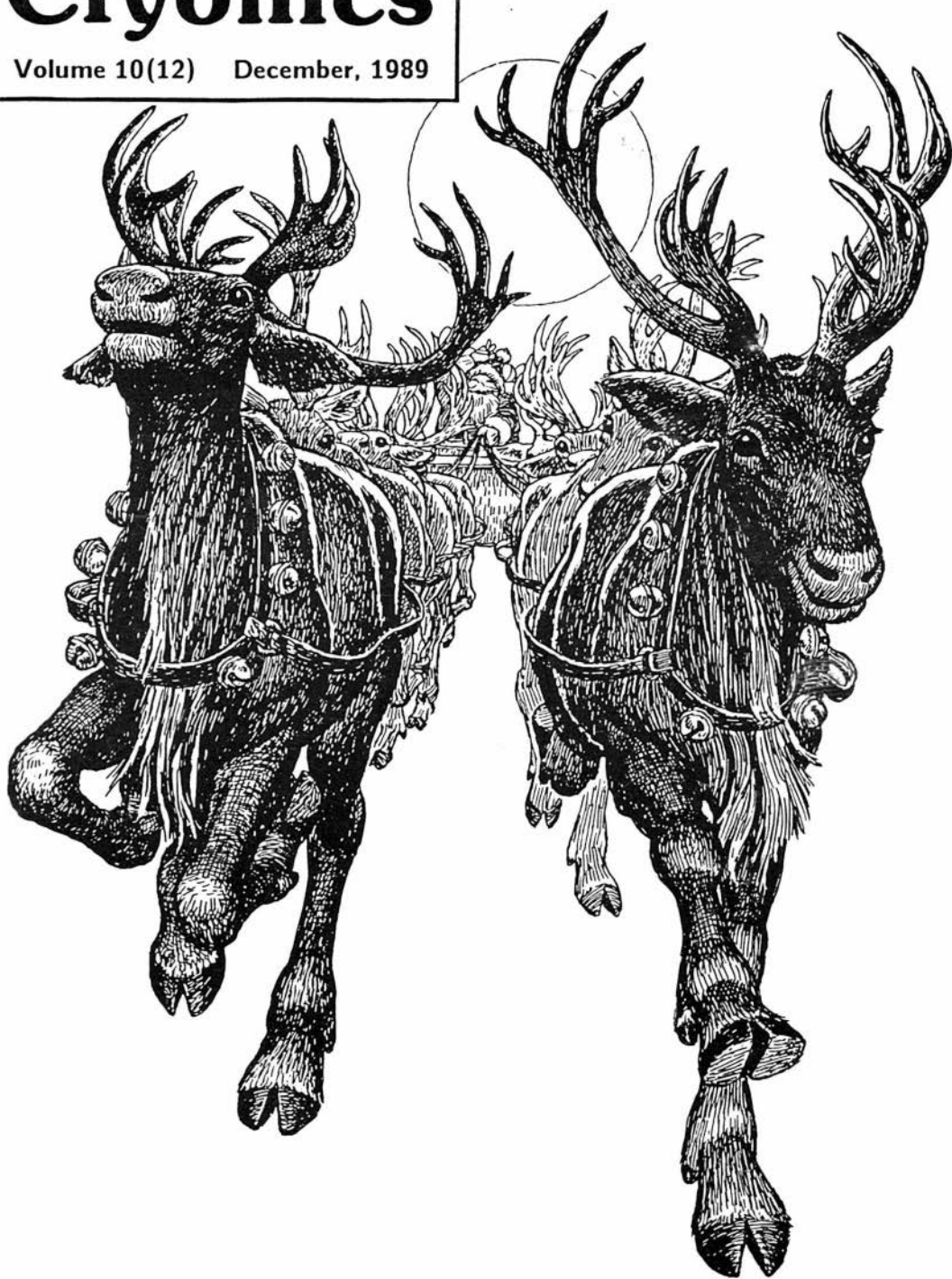


Cryonics

Volume 10(12) December, 1989



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EDITORIAL MATTERS

This month we surrender *Editorial Matters* to Steve Harris, M.D. We wish to second his thanks and to offer encouragement to those who wish to support the Walford/Harris mouse project.

Thank You For the Anti-Aging Experiment Contributions

In the September issue of *Cryonics* I took the liberty of making an unusual request for donations from the members of Alcor. That request was for money to be used directly to continue funding of an experiment to see whether the powerful antioxidants *Coenzyme Q10* and *WR-2721* will slow the aging process in laboratory mice. This is an exciting project which has been running for less than two years, and which will not produce substantial data for another year.

I'm very gratified to report that I've received donations from 18 people so far, as well as a grant from the *Life Extension Foundation* in Hollywood, Florida. These donations and grant total \$5,800 to date, which is more than a third of our target \$15,000. As a result, the experiment continues on track, with the mice doing well. The mice thank you, Dr. Walford thanks you, and I thank you.

For those of you who have thought of supporting your own piece of gerontological research but haven't taken the leap, there's still plenty of opportunity. Many of the private donations we've received for this project have been quite large, and this suggests to me that many of the people with equal desire but fewer resources have been shy about contributing smaller amounts. Don't be! If all the members of Alcor contributed \$25 to this project, it would put us over the top. Like Jim and Tammy, we'll take donations of

any size. We'll even promise to add your name to the pathology lab prayer circle, if that's what it takes to get you to write us.

To donate to the Walford/Harris UCLA antioxidant aging experiment, make your check out to "Regents of UCLA." Send it to Steven B. Harris, M.D.; Department of Pathology; Center for the Health Sciences; University of California at Los Angeles; Los Angeles, CA 90024. Include a letter saying that the money is a donation for aging research, and that it can be used in any way our laboratory sees fit. This last clause is one which UCLA makes us include so that it doesn't have to worry about legal strings attached to the money its labs spend. It's a formality as far as we're concerned, since all donated money goes to the antioxidant experiment fund.

Again, thanks.
Steve Harris

* * * * *

Alcor's Legal Status

by Hugh Hixon

This is a summary of Alcor's legal affairs, as of 26 November, 1989.

Readers interested in more of Alcor's legal affairs are referred to my previous summary in the March, 1989 *Cryonics*, and to the issues of *Cryonics* cited for each case.

* * *

The Two Wills of Richard Clair Jones. David Epstein, Esq., of Garfield, Tepper, Ashworth, and Epstein vs. others representing Dick Jones' former business partner, his sister, and her children. See *Cryonics*, 10(1), 8 (Jan '89); 10(5), 5 (May '89); Carlos Mondragón's report in the July, 1989 issue, and Saul Kent's account in the September issue. The judge in the case turned out to be hostile and prejudicial, and contrived to force a settlement. We attained our most important objective (the control of Dick Jones' suspension) and negotiated a settlement where we paid everyone's court costs, got Dick's house and other real assets, and half of his residuals for several very popular television series he originated. His former partner, Jenna McMahon, was left as the executrix and trustee of his estate.

* * *

The Dora Kent "homicide investigation". Riverside County Deputy District Attorney Kurt Hinman attempted to use the County Grand Jury as a tool to elicit information from several to the team members present at Dora Kent's suspension. See *Cryonics*, 10(1), 12 (Jan '89); 10(9), 1 (Sep '89); and 10(10), 11 (Oct '89). Hinman offered them a limited form of immunity not recognized in California and they took the Fifth Amendment and were upheld in Riverside Superior Court. Hinman appealed to the 4th District Court of Appeals in San Bernardino. Alcor engaged the head of the California Trial Lawyers Association *pro bono* to defend against Hinman's attempt to rewrite California's immunity statutes in the courts.

As the presiding judge of the court pointed out to Mr. Hinman, the form of immunity he proposed was consensual rather than compulsory, and far from consenting, the Alcor team members had "told [him] to stick it in his ear." Appeal denied.

At last word, Mr. Hinman has appealed both negative decisions to the California Supreme Court. The court will decide whether to hear the case probably sometime in December. His chances don't look very good, but on the other hand, he doesn't seem to have anything further to lose, or anything better to do in the Riverside DA's office. And if he loses, he'll probably think of something else to try and keep the case going.

* * *

Henson, Merkle, and Alcor vs. Mitchell. Formerly *Roe vs. Mitchell*, this case has been delayed by more pressing affairs. Alcor Suspension Members Keith Henson and Ralph Merkle have been drafted to replace Dick Jones (Roe) as interested parties. See *Cryonics*, 10(1), 8ff (Jan '89); 10(5), 11 (May '89). This case could be titled "Cryonic Suspension vs. the Bureaucrats", and may well make or break cryonics. Due to various delays, there will be no possibility of a decision until February 7, 1990, when Alcor will propose a summary judgment that could deliver a knockout blow to the previous negative rulings toward cryonics by California's Department of Vital Statistics.

* * *

The Six vs. the Coroner. The County of Riverside apparently got tired of waiting for some conclusion to the Dora Kent "homicide investigation" and has proceeded in its defense of the false arrest lawsuit by Alcor members who were hauled off in handcuffs during the Coroner's 7 January, 1988 raid of the Alcor facility. One deposition of an Alcor plaintiff has been taken, but the rest have been delayed by attorney's scheduling conflicts until after 5 December. This suit will certainly drag on well into 1990. Alcor attorney Chris Ashworth took the case on contingency.

* * *

Alcor Electronic BBS Users vs. the Coroner and others. During the second raid of the Alcor facility on 12-13 January, 1988, the Coroner unwittingly (how else!) ran afoul of the Electronic Communications Privacy Act of 1986. Keith Henson has been pursuing this, and attempted to get Federal authorities to act, to no avail (too much glamour in the War on Drugs, perhaps). See *Cryonics*, 10(1), 13-17 (Jan '89) and 10(2), 10 (Feb '89). However, civil recourse is also provided by law, and Alcor's constitutional attorney, Chris Ashworth, has been persuaded by Keith to take the case on contingency. No action as yet, but the suit must be filed before the statute of limitations clocks out in January, 1990.

* * *

Kent vs. Trask. Kent is of course Saul Kent. Grover Trask is the District Attorney of Riverside County. See *Cryonics*, 10(10), 7-12 (Oct '89). In September, Alcor was notified that California's Board of Medical Quality Assurance (BMQA), of the Department of Consumer Affairs, which was invited to the Dora Kent raid by the Coroner, was investigating Dr. Steve Harris and members of the Dora Kent suspension team. The charges proposed were "unauthorized practice of medicine before and after death" (!!). Alcor generated a pre-emptive countersuit to block the DA from assisting BMQA in threatening Alcor and its members in going about their lawful occasions (i.e., cryonics). The DA has been noticeably upset by all this. One is reminded of a verse from Gilbert and Sullivan's *Iolanthe*:

*The Law is the True Embodiment
Of Everything that's Excellent
It has no kind of fault or flaw
And I, my lords, embody the Law*

Sorry 'bout that, DA.

The case is now running into its sixth week since the hearing for a Preliminary Injunction against the DA. It's hard to guess how Judge Timlin will decide, but the consensus is that it would have been very easy for him to simply turn us down on the injunction.

Undoubtedly, a lot of people are asking why we are spending money on all this agitation. The answer is simple; this is part of the struggle to get cryonic suspension accepted by our society. The outcome of it is also simple; either we win, or we die.

* * * * *

FROZEN EMBRYOS: ROUND ONE IS OVER

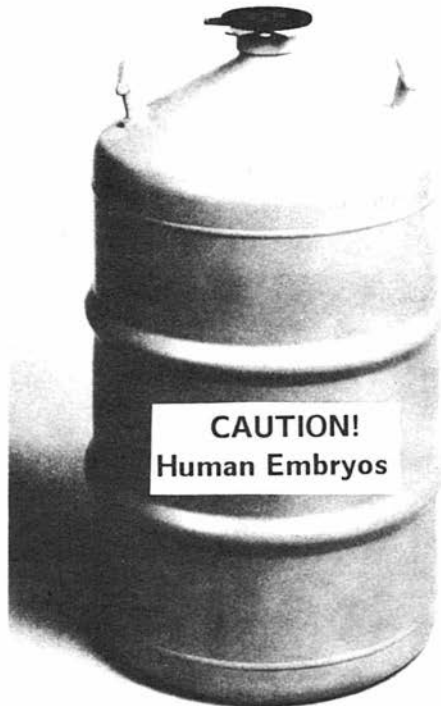
by Mike Darwin

In the May issue of *Cryonics* we reported on the case of the divorced Marysville, Tennessee couple fighting it out in court over the issue of who should have custody of the couple's seven frozen embryos. The wife, Mary Sue Davis, wants to have the embryos implanted and bring them to term. The husband, Junior Lewis Davis, does not want to be a father and wants the embryos to stay right where they are: *safely frozen*.

The case went on to attract national attention after we first reported on it. Indeed, as seems to be the rule in "suspended animation cases" the whole affair became something of a media circus.

On September 21, 1989, State Circuit Court Judge W. Dale Young ruled that the embryos, created through *in vitro* fertilization and stored in the solid state at -196°C are *life, not property*. Judge Young awarded temporary custody of the embryos to Mary Sue Davis. Junior Lewis has vowed to appeal the case all the way to the Supreme Court if necessary.

What does all this mean, if anything, to cryonics and cryonicists? There are probably as many answers to that question as there are cryonicists. This editor has an opinion too, and I would like to share it with the readers of *Cryonics*. I expect that many will disagree with me. They are encouraged to set their pens or computers to paper and write for the pages of *Cryonics*.



The closing years of the 1980's have seen this nation deeply divided over a difficult question: when does human life begin. Is it at the moment of conception? Is it at birth? Or, is it somewhere in-between. This article will hardly resolve that issue. But it is an issue worth considering because it is a dress rehearsal for another major issue which will confront this country and this civilization: where does life end? And that issue, I think all of us cryonicists will agree, is one that is very much of relevance to our situation.

The problem with abortion is at least as much a problem with fundamental philosophical issues as it is with biological ones. What rights and responsibilities do people have with respect to each other? For instance, in Nazi Germany if a Jewish family showed up on your doorstep and explained that they would be killed unless you took them in, fed them, and clothed them, would you be guilty of any crime in turning them away? What if they were a communist family in the same position? In other words, is someone else's need an obligation on you, even it means the difference between life and death? And what if you voted for Hitler, but now are having second thoughts (much as one might engage in reproductive behavior without giving thought to the consequences in terms of *actually having a child*)?

Before one can decide about the morality of abortion, one must first answer these questions and then go on to deal with others, such as when a human being should be provided the protection of basic rights and the protection of the law.

Because the development of "humanness" is a more or less continuous process, deciding when a person becomes a person is difficult. In classical Roman times and even into the early Christian period, personhood was awarded at birth. Indeed, until relatively recently, aborted fetuses and stillbirths were not buried in hallowed ground and were not treated as human. It was not until the 19th Century that abortion was even made illegal and then only by an Act of Parliament to protect the health of women (since it was such a dangerous procedure at that time). Birth was the time at which rights of personhood were extended. This is a nice, clear definition. Other cultures have not granted full personhood until certain milestones such as independence or "coming of age" are met. The Australian aborigines do not grant the protections of personhood until the child reaches the age of two and is "adopted" into the tribe. There is, in short, a wide range of times and conditions under which various cultures award the right to be human. Even as little as 150 years ago our culture did not give some people the right to full protection under the law (and thus to full personhood) simply because they were black.

10-ounce miracle finally goes home

The Associated Press
CHICAGO — A baby who was born weighing about 10 ounces, with feet smaller than her father's thumbs, spent her first night at home and was "a little bit tired" after her big day, her father said yesterday.

"We're just real happy to have her home," said James Mann, after his daughter Madeline's homecoming Thursday. Madeline was born June 27,

"We are so blessed," said Madeline's mother, Robyn, and, as they left Loyola University, she added, "as long as I'm alive, as long as we're a family, I don't think I'll ever be able to do anything to deserve this."

When delivery-room nurses imprinted Madeline's newborn footprint on the back of her father's shirt, it was still smaller than his own.

Riverside Press-Enterprise, 10/28/89

Nevertheless, the trend, at least in this culture, has been clear: increasingly conservative criteria have been applied when attempting to decide the issue of who has "rights", particularly when the issue is a life or death one. There have been two notable reversals in this trend in recent years: functional re-instatement of the death penalty and the Supreme Court's ruling in *Roe vs. Wade* allowing unrestricted first trimester abortion.

I should state my position at this point: I do not *like* abortion and I am adamantly opposed to capital punishment. Why, and how do my positions on these issues relate to each other and to cryonics? The answer to that question is simple in principle, but rather hard to communicate. I'll start with what I hope will be the clearest example, capital punishment, and end with abortion.

I am opposed to capital punishment not because I feel it wrong to end the life of a despicable murderer. I have no problems with such a desire or such an act in principle. But the problem becomes carrying out such a procedure in practice. *How* do we insure that we only eliminate the guilty and *never* the innocent? The answer is, at this time, there is no way to do that. The history of American jurisprudence is chock full of innocent people sentenced for crimes they didn't commit. Judging from the headlines, the situation has changed little in recent years and innocent people are still being incarcerated (and probably executed) for crimes they didn't commit. Not a month goes by that someone isn't being let out of prison for a rape or a robbery or a murder they didn't do.

The point is here that they are around to get out of prison and in some cases to win very large sums of money as compensation for their unjust incarceration. No such luck with people who've been *executed*. The problem with capital punishment is that it is *irreversible* and it has, as a corollary effect, the ability to *irreversibly silence someone*. This strikes me as too potent and irreversible a tool to give to bureaucrats, whose frequent lack of competence and honesty I can personally attest to.

Killing someone is an irreversible act which forever cuts off that person from any chance of restitution if an error was made. Thus, capital punishment is, in my opinion, both a radical and a reckless act. It is not conservative of justice since it admits of no possibility of being undone. Reasonable doubt isn't certainty, and in a philosophical universe where innocent human life is held sacrosanct (i.e., mine and presumably many if not most cryonicists') it cannot be tolerated.

Money doesn't erase prison traumas



The Associated Press

Robert McLaughlin gets a hug from fiancée Heidi Hanson. McLaughlin was wrongly imprisoned for 6½ years.

By TONY KENNEDY
The Associated Press

ST. PAUL, Minn. — Bobby McLaughlin is about to get his due for the 6½ years he spent in "the gladiator school" and other prisons for a murder he did not commit.

But the \$1.9 million award made last week by New York Court of Claims Judge Adolph Orlando will barely begin to soothe the pain.

"People think I'm winning the lottery or something," the former New York resident said from his St. Paul apartment. "Well, they owe me. If they had given me a choice, I wouldn't have gone through all this for \$50 million."

Orlando awarded McLaughlin \$1.5 million for "loss of liberty, mental stress, anguish and loss of reputation." The judge also ordered payment for lost wages and \$225,000 in medical expenses for treatment of McLaughlin's addiction to cocaine and other drugs

that stemmed from his experience.

"It's unlikely that he will survive the devastating trauma resulting from incarceration crime he did not commit," Judge said.

McLaughlin, 30, was arrested in 1979 in the New York City neighborhood of Brooklyn for taking part in an armed robbery in which a person was killed. McLaughlin received a 15-year sentence.

McLaughlin said he was drinking with friends at a restaurant in his neighborhood the night of the killing. He was arrested days later because the suspect was reputed to be a friend of a Robert W. McLaughlin, a police detective who had been arrested by whose middle initial

McLaughlin was picked up by a police lineup by a 15-year-old witness who had been arrested by police that McLaughlin was a friend of the other suspect.

"I kept telling myself

Cryonics presents a similar issue. When does life end? Well, it now ends when a group of "experts" (whom the vast majority of reasonable people acknowledge are experts beyond a reasonable doubt) decides that there is no reasonable probability or possibility of restoring that person to function at a level the experts feel is worthwhile.

We think they are wrong. But keep in mind that we are a tiny minority, widely regarded as being crazy, incorrect, and/or frauds. We are very much in the position of the poor, lower class person who finds himself convicted of a crime he didn't commit and sentenced to die. Reality is just too kinky a place with too many twists, turns, and unexpected complexities for people to be going around making radical and irreversible decisions. Like capital punishment. Like incinerating people when their hearts stop and cannot be restarted (or, more likely, Dr. X says they shouldn't be).

Finally, we come to abortion. When does human life begin? Well, pretty obviously at conception. But when does a human life become a human person? That is a much tougher question to answer. Does picking a very conservative point to extend personhood (such as conception) in cases where reproductive behavior was voluntary so interfere with the rights of women (and men too!) that it is unacceptable? Does engaging in voluntary reproductive behavior constitute a contingent contract with any offspring that may result? Tough issues!

Before we dismiss them out of hand it might do cryonicists some good to think about the conservative answer to that question in the same light they think about the conservative answer to the question of when life ends. Is the severed frozen head of an 86 year old woman's corpse worthy of "personhood" just because a small band of "crazies" in opposition to the vast majority of the scientific, cryobiological, medical, and legal communities says that it has the *potential* to be a person at some point in the future (who knows *exactly when* if ever)? Do the rights of these people outweigh the state's when the issue of a medicolegal autopsy arises?

I suggest that we, as cryonicists, have a great deal more to gain from a very conservative, "lets not make any mistakes" approach on the part of the law than we have to gain from a "kill 'em all and let God sort 'em out" attitude.

Much like opposition to capital punishment, settling on conception as the time to extend "personhood" is likely to be very costly and inconvenient, perhaps too much so. But until someone comes up with a very clear, very objective definition of when personhood begins, it will continue to be argued that it is not unreasonable to draw the line as conservatively and thus as carefully as possible.

In any event, regardless of where the line ultimately gets drawn, in a country such as ours, where there are now more abortions than there are live births, a little thought on these issues and on the subject of personal responsibility is long overdue.

* * * * *

Michigan Cryonics Conference

by Mike Perry

October 6-8 (Friday, Saturday, Sunday) there was a cryonics conference in Detroit, Michigan sponsored by the Immortalist Society, which I was able to attend. The following is a brief summary of events, based on an article that appeared in *Venturist Monthly News*, Nov. '89. More information is expected to appear in *The Immortalist* (address: 24443

Roanoke, Oak Park, MI 48237), and other publications (particularly of *FOCS* and *Lifepact* — see address below).

Following a reception on Friday evening, Saturday was devoted mainly to formal presentations, and Sunday consisted of more informal meetings to "rub shoulders" generally and (as it turned out) begin plans for a *Federation of Cryonics Societies* (FOCS). Some further highlights were Ralph Merkle's talk on molecular repair of the brain, Robert Ettinger's opening speech in which he called for the right to be frozen before death, and a dinner speech by Jackson Zinn in which he praised Alcor and former Alcor president Mike Darwin for their courageous stand against a coroner who attempted (fortunately unsuccessfully) to thaw one of their patients. Several presentations were devoted to what can be called cryonics-supporting organizations, which do not do actual freezing but instead offer services in support of organizations that are directly involved. In addition to *FOCS* (which Fred Chamberlain who proposed it suggested pronouncing as "focus") there are *The Venturists*, *Lifepact* (sponsored by Fred and Linda Chamberlain), and the *Reanimation Foundation* (organized in Liechtenstein by Saul Kent). The latter two organizations are devoted to conservation of the member's records or assets while in cryonic suspension, assisting with reanimation or in maintaining suspension, and related services. (Readers interested in the *Reanimation Foundation* should address inquiries to: Asset Preservation; 16280 Whispering Spur; Riverside, CA 92504. Those interested in *Lifepact* or *FOCS* may address inquiries to these organizations at: P.O. Box 18698; South Lake Tahoe, CA 95706.)

FOCS is to be an umbrella organization whose members will consist of cryonics organizations and supporting organizations. In addition to serving as a public front for cryonics organizations, it may perform other functions such as regulation of cryonics. (Given that we are bound to be regulated sooner or later, it's better that we be regulated by ourselves than from the outside, as I emphasized.) Some differences of opinion emerged, with some favoring more of a "public front" organization and others an organization with more control over constituent cryonics groups.

Finally, there is *The Venturists*, an organization that also intends to become involved, on some



level, in conserving property of members in cryonic suspension, and assisting, if necessary, in maintaining suspension and in eventual reanimation. Generally the emphasis there is expected to be on storage of records ("intellectual property") rather than tangible goods or assets, and in providing funds on a blanket basis for those who may be in need, in the "Good Samaritan" tradition.

Throughout it all the Ettingers (Robert and Mae) were gracious hosts, presiding over the meetings and holding a reception afterwards at their house with lots of good things to eat. There was a far-out conversation Sunday afternoon at the Ettingers', relating to physics and the nature of reality. One problem discussed was that of retrieval of information to be used in resuscitation, reconstruction, or resurrection, of a previously deanimated human. (The right "revival" term is a function of how much information is left and your point of view). The problem is made simpler, of course, the more information there is about a past individual there is, but the view was aired that perhaps it should not be considered hopeless, in an absolute sense, even in the worst cases. At least three of the participants (Ben Best, Bob Ettinger, and myself) were advocates, in one form or another, of a deterministic universe. I expressed the opinion that "loss of information makes the past ambiguous" and Mae Ettinger said seriously, "you're exactly right".

A final event, which some of us were able to attend, was an inspection of the *Cryonics Institute's* storage facility, where two patients are currently in suspension. My impressions: the facility was small but neat, with a remarkable homegrown technology — the dewars were of resin-bonded fiberglass, manufactured in place by their technician, Andy Zawacki, based on designs by Robert Ettinger himself. A unit capable of holding six patients is under construction. They also have a small operating room with a perfusion machine constructed some years ago by Walter Runkel.

I should also mention Alcor's hospitality suite held on Friday and Saturday evenings starting at 10 PM. I spent a lot of time talking to several guests who were close relatives of people frozen at Alcor. They had not signed up themselves as yet (though some appeared to be thinking seriously about it) nor had any of their other relatives. They pointed out the problems that a cryonic suspension in an otherwise non-cryonicist family causes, e.g., it is seen as weird, and there is no funeral or usual means of grieving and "letting go". I said I sympathized, but that I'd rather have that problem than the opposite one of being a cryonicist confronting a loved one who will *not* be frozen. (Unfortunately I have had that latter problem recently, with the death of my mother.) I also talked to a man who had had his father buried in permafrost, saying he lacked the funds to arrange for cryonic suspension. I advised him to have his father's remains, at least the head, transferred as soon as possible to liquid nitrogen storage, and he said he intended to do that, but wanted to arrange cryonic protection for his whole family at once.

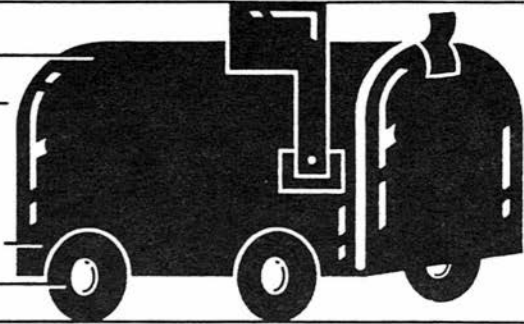
Beyond these personal anecdotes I got the impression that the suite was well attended and highly successful. There was lots of time and refreshments to inspire further acquaintance with cryonics and the people in it.

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MEMBERSHIP STATUS

Alcor now has 145 Suspension Members, 291 Associate Members, and 13 members in suspension.

*Letters to The
Editors*



Capitalism, Libertarianism and Nonprofits
by Robert W. Krueger

As a Ph.D. physicist with most of my life spent as a businessman (with experience founding and running both for-profit and nonprofit organizations), I, on the one hand, greatly admire the amount, depth, and breadth of Dr. Donaldson's mostly technical articles. On the other hand, I view the article entitled *Economics of Cryonics* in the August *Cryonics* as containing some misconceptions of economic and political systems.

A free market (and its competitiveness) is one of the fundamental characteristics of capitalism. Even the societies that have embraced socialism (production controlled by some authority supposedly representing the people) and communism (production and consumption controlled by the authority) are moving into a free market. But the free market is not enough and their moves in that direction will not work without the second and more important fundamental characteristic of capitalism: the private or individual ownership of property and businesses that brings the profit motive into full play.

Liberals and socialists have continually decried the profit motive as "dirty" or even evil (as does Donaldson to a degree in his references to used cars and Tricky Dicky) because they feel people should be motivated to do things for the public good (part of the idealistic and unrealistic goals of socialism and communism). But even they, observing recent world developments, concede socialism and communism don't work and the "dirty" profit motive does. While there are other motives driving people -- power, recognition, and even doing good for others -- the profit motive is so universal and dominant, that only it under capitalism has performed well over all the history of mankind under various political systems (from pure democracies to pure dictatorships).

Capitalism is an economic system and, as has been said, can work with any political system (with various degrees of efficiencies); socialism and communism were meant to be economic systems, but their nature induced a centralized political system and in every historical case it has been of a non-representative type. Capitalism, which requires economic freedom, works well with representative government and best of all with a political system like libertarianism with its high degree of political freedom. I am told by a libertarian who knows the subject better than I that libertarians view government as forcing people to do things and therefore they favor none or very little government and, further, strongly favor capitalism as an economic system because both libertarianism and capitalism stand for individual freedom.

For-profit businesses are part of the fabric of capitalism. The capitalistic principle of the profit motive works best when the business owners and its managers are

the same people, causing the owner-managers to be personally rewarded (through direct cash rewards or through the cash value of stock) when the business makes good profits. Firms of this type are mostly small businesses and young growth firms (less than \$500,000,000 in business volume). The U.S. capitalistic system works in spite of socialistic government controls because the great majority of businesses fall in this category and their aggregate business volume is a majority of the private sector. Most managers of these firms in striving for great monetary rewards, know that in the long run, they cannot get them without satisfying their customers. Thus, in the great majority of capitalistic firms, the "dirty" selfish motives of individuals in businesses collectively are converted to the public good. Exceptions of course exist in a small number of firms with truly evil people motivated for money in improper ways. However it should quickly be added that motives in other kinds of organizations, government and nonprofit, for power and recognition can also cause evil results. I strongly disagree with Donaldson's view that fraudulent sellers will drive out all honest ones or that the public will distrust for-profit sellers (propaganda by socialists notwithstanding).

Nonprofit* organizations consist of foundations, trade associations, universities, and service organizations. In this discussion I am concerned mainly with the latter, where such firms perform services for clients in a manner similar to for-profit organizations. These in turn cover a wide spectrum, from those that are closely associated with a government entity, such as the Rand Corporation used to be (where competition did not exist) or to a university (e.g., Stanford Research Institute), to the other end of the spectrum, where they include free-standing nonprofits that engage in competition with each other and with for-profit type firms. But all of these nonprofits lack one of the two fundamental characteristics of capitalism -- the profit motive. This, of course, arises from the fact that these organizations are not "owned" by anyone. They are governed by either a self-perpetuating Board (e.g., the Rand Corporation) or the Board is elected by client-members ("membership" in nonprofits is really a collection of clients). The managers of these organizations receive no special rewards for their efforts in successfully building their organizations. Thus the great majority of these firms are very much more inefficient than for-profit firms engaged in similar activities (this statement is supported by the fact that government contract work shows nonprofit overhead rates to be very much higher than those of for-profits -- even though the statement should be obvious). The difference between a nonprofit firm and a for-profit firm engaged in the same type of activity is not merely a structural change (as Donaldson says); rather the difference is so vast that these organizations are really not part of the capitalistic system. These firms are usually classified as part of the nonprofit sector in three sectors of our economy: government, the nonprofit sector, and the private sector (capitalistic). Here the efficiency level of the nonprofit sector is close to that of the government sector -- indeed very low. Unfortunately as Donaldson observes, the nonprofit sector and the government sector are both increasing as a percentage of our total economy, gradually squeezing out the private sector.

Is there really any place at all for nonprofit firms? I believe the answer is "no" except in cases where no private sector firms exist capable of doing the same kind of work or where the nonprofit firm is motivated strongly by some nonmonetary factor. An example of the former exception is the situation in 1948, when the Rand Corporation was formed, closely linked to the government, to be engaged in long range strategic planning of military matters, and there were no for-profit firms capable of doing the same (later on, when for-profit firms in this field were formed, the need for Rand and other firms of its type no longer existed, but it still lingers on). An example of the latter exception is

* A better term increasingly in use is not-for-profit; such firms really can make a profit but they cannot use it in the manner of for-profits.

the case in Alcor, where the Board members have a strong motivation to increase the probability of their own immortality through the strengthening of Alcor and, in addition, they are motivated by the excitement of being in the vanguard of something radically new (I saw this latter motivation when I was a key member of the staff at the birth of the Rand Corporation, but after a few years, the steady state of lack of drive and hard work set in -- the normal for a nonprofit).

What about the broad area of health services? First, I see no reason why the general argument above applicable to other parts of our economy should not also apply to health services (or for that matter, other dominantly nonprofit services such as the Post Office), since for-profit firms with capitalistic motivation have superior efficiency. Studies made by my old firm, Planning Research Corporation, showed that the major inefficiencies in the dominant nonprofit hospitals were the principal cause of the rise of medical costs at a faster rate than inflation (good statistical information on for-profit medical institutions is not available, as Donaldson has noted). Donaldson quotes Weisbrod as supporting nonprofits, but I believe the information is suspect because professors in universities are to a heavy majority liberal and believe to a large degree in socialism and the welfare state, and they in general are heavily represented in universities because they know either consciously or subconsciously that they could not make it in a capitalistic environment. In this discussion I am putting aside the issue of how and by whom medical costs are paid and instead am emphasizing who should perform the health services. In other activities supported by big government, for example in the professional services with which I am very familiar, there is a continual effort to convince the government (socialistic) type people to contract with the efficient private sector, rather than with nonprofits.

Does a strong nonmonetary motive exist in health services in general similar to the special Alcor motives? I believe in the great majority of the cases the answer is no. Unfortunately, while some socialistic and communistic societies are beginning to recognize the need for the selfish monetary motive, Donaldson viewing the capitalistic system as used cars and Tricky Dicky, seems to want us to move in the opposite direction relying on the rare presence of a nonmonetary motive to make a nonprofit efficient.

What does all this mean with respect to Alcor? I feel the answer is still the same as the statement in my Letter to the Editor of February, 1987: Alcor need not yet move to for-profit status because of the special motivation of its principals and because the nonprofit status still is advantageous with respect to the tax deductibility of donations. But sometime during the next decade with reasonable growth of Alcor and its industry, the shift to for-profit status should take place.

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Thomas Donaldson replies:

To the Editors, *Cryonics*

Thank you very much for letting me see Bob Krueger's article. My chief feeling on reading it is a mild sense of injustice. When I wrote the article I was acting the role of *reporter*. That is, I was describing what *someone else* had said. I said so in the article. If Bob Krueger wishes to argue with the origin of these opinions, I would refer him to Dr. R.A. Weisbrod directly, who can be reached at the Center for Health Economics and Law, University of Wisconsin-Madison, Madison, WI 53706. I would be very happy to send him a photocopy of the original paper; he can also get it from his own library. In fact, I'd be quite interested in the outcome of the conversation.

That being said, however, I do have some comments. First, I don't believe libertarianism, as a philosophy, should allow *only* corporations working for a profit. Nonprofit corporations may well be efficient or inefficient, they may flop completely in a libertarian society or alternatively take everything over. That should not be relevant. We are discussing *definitions* here, not what works. Our thinking will become very confused indeed if we confuse definitions with statements about the world.

In that sense, the question about nonprofit corporations can at least be *asked* in a libertarian framework.

One basis for Weisbrod's opinion consists of statistics measuring performance of nonprofit hospitals etc. compared to for-profit ones. I believe an interpretation of Bob's comments would say that he argues with Weisbrod's statistics as not being relevant in a situation in which business is more free. That point is entirely valid. If, however, we are to argue any such point with statistics and statements of *actual real behavior* by real people, we will have to use the behavior and the people available to us. We don't have a fully libertarian society with which to compare.

My own best suggestion, and criticism of Weisbrod, would be that the whole issue needs to be looked at on an international level. At least this would provide a broader base for statistics. Coming to the US from from a long sojourn overseas, I notice that even between countries in the English tradition a lot of variation exists in the precise legal interpretation of "freedom". The differences are even greater on a broader level. We might, perhaps, carry out a test of Weisbrod's thesis internationally.

Finally, as to the profit motive and "Tricky Dicky". I have disagreed many times, even with my wife, on the question of whether the profit motive is or is not moral and worthwhile. I think it is. At the same time, I do not think Bob wants to deny that used car salesmen *are* generally thought of as sleazy. As for Nixon the man, rather than Nixon the current public image, I have very little to say and regret if my comments were thought to be about one rather than the other.

Thomas Donaldson
Sunnyvale, CA

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OVERSIGHT ACKNOWLEDGED AND COMMENTED UPON

by Mike Perry

Making sense out of statistical data can be tricky. My comments on question #57 of the Alcor survey (see *Cryonics*, October, 1989) contained a major oversight, which I thank Jerry Leaf for pointing out, together with some unwarranted conclusions. The question asked how many among the respondents had served in the military. The results (tabulated by Max O'Connor) came out 27% among the SM's (persons signed up for cryonic suspension) and 18% among the others (the "AN's"). Although "a large majority" (at least 73%) of each group did not serve in the military, it does not necessarily follow from this that cryonicists and sympathizers, or libertarians for that matter, exhibit any particular anti-military sympathies, contrary to my comments on this question.

To judge how cryonicists stack up on military service or any other statistic one must, of course, compare them with a more general population sample. (After all, we are trying to find what makes a cryonicist tick, not just in absolute terms but in comparison with a typical human.) A rather extensive investigation and tabulation by Jerry Leaf and myself produced the following results: First, the question of military service is

reasonably limited to males only, since females rarely serve. (Only about 1.4% of the U.S. 18-and-over female population are military, and none of the SM's or AN's were female and military. For purposes of this study, "military persons" consist of veterans and those on active duty who would be classed as veterans after discharge.) Second, when the study was limited to males, we found that the proportion of military persons among SM's was within 10% of the national average, both for libertarians and others, but among AN's it was 34-50% below the national average for both groups. Only the AN's, then, comprise a group that might be characterized as "significantly unmilitary", relative to the national average. The SM groups do not appear to be strongly more or less "military" than average, and libertarians are not substantially different from others within their respective groups. One complication was that some of the respondents were not U.S. residents but came from other countries which may have significantly different traditions of military service. I did two tabulations, one for the different groups as a whole, the other excluding identifiable foreign respondents (extended to include those known to have immigrated to the U.S. within 5 years of the survey). Results, showing sample sizes and percentages of those with military service in each group, are as follows:



	SAMPLE SIZES:		MILITARY SERVICE, %:	
	all:	U.S. only	all:	U.S. only
Eligible pop. (1987-88)	--	87 million	--	32
SM's	58	50	31	34
SM's, Libertarian	30	23	30	35
AN's	36	34	19	21
AN's, Libertarian	19	18	16	17

(Note: some of my figures differ slightly from Max's; e.g., checking the original data I found 38 total AN's, not 37 as he reported. In one case a "military person" was dropped from my list because his service consisted of ROTC, which would not qualify him as a "veteran". Data for the national average came from the Census Bureau in Suitland, MD, the Veterans' Affairs Office, Washington, D.C. and the Department of Defense, Washington, D.C. All subjects, both nationwide and in the survey, were 18 and older.)

A further comment: the above sheds additional light on the question of attitudes about the military and military service among those interested in cryonics, and corrects some of my earlier misapprehensions, but certainly does not tell the whole story. For

example, not one of the 20 male respondents (10 SM's, 10 AN's) who were 30 and under had had any military service, other than the gentleman with the ROTC; this included six known foreign residents. On the other hand, a high proportion of the Alcor male directors (43%) and male patients (at least 62%) are veterans. One wonders how strongly the observed patterns of military service depend on the Vietnam war -- or previous wars, for that matter. More analysis might answer more questions, but it's expensive, especially if extended to the survey as a whole.

A final comment: none of the foregoing, nor my earlier comments for question 57, were intended as a blanket condemnation of military organizations or those who have served in them. For whatever it's worth, while deploring violence, much of which was wrongly inflicted by various military establishments, I am not a total pacifist but feel there have been circumstances in which the use of force was justified for the greater evil it opposed.

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Jerry Leaf comments:

TO: Editors of Cryonics

From: Jerry D. Leaf

Subject: Survey in Cryonics, Vol.10(10), Oct. 1989, page 55, Question 57, comment.

Dear Sirs:

Being a cryonicist, a libertarian, and a veteran, I do not believe there is necessarily a negative correlation between the three. Robert Ettinger conceived the idea for cryonics at an Army hospital while recovering from injuries received in combat. Every veteran is a unique individual, like the rest of humanity, each has his/her own story. To be a veteran does not mean that one views the "military regimen" and "warmaking" as palatable (or at least not finger-lickin' good). On the contrary, those of us who have been to war know most directly how "...insupportable to the delicacy of the human feelings..." such action can be.

There are three things I cannot abide; 1) strangers carrying AK-47s, 2) priests who try to educate me about fornication, and 3) people who think the high ground they are standing on was not, at least in part, paid for by those buried in it.

I thank Mike Perry for hearing me out and for his comments above.



* * *

To The Editors,

I had the fortunate and pleasurable opportunity to attend the cryonics conference sponsored by the Michigan Immortalist Society this past October 6-8. From my father I have known about cryonics for maybe 20 years because of his personal interest. This conference was my first real exposure in a direct way, and was, without a doubt, an interesting and informative experience. I'd like to share some of those experiences with other readers of *Cryonics*.

With my dad's passing and cryonic suspension (*Cryonics*, June, 1988) many thoughts, uncertainties, and questions had accumulated, many having to do with the fact that the "traditional" did not occur. So much was unknown. The normal emotions experienced with the death of a loved one do not disappear quickly; they are compounded by a nontraditional approach. With time, curiosity sent me to the conference, admittedly with a lot of apprehension.

I had the unexpected pleasure of meeting others who had recently experienced a loved one being placed into cryonic suspension. Without question, my discussions with them were difficult, and yet it was very helpful and reassuring to learn of their experience with cryonic suspension so "close to home". To those individuals, thank you for being so kind and open with your feelings.

The speakers and the programs that they offered were of great value. Science can be very technical and difficult to understand; without doubt the speakers put a great deal of effort into being very explanatory -- so even this "lay person" could relate to the subjects. I was surprised to find out that the study of tomorrow's medicine is so applicable to today's life.

And I must comment on the attendees. I don't think I met anyone without a positive mental attitude. Everyone wants a little more than "tradition" now offers. Not a bad group to hang around with!

And finally, a word about the people of Alcor. In retrospect, the most important reason for attending the conference was to meet some of them since they are caring for my father. And they are just that, caring people with feelings, emotions, and realistic beliefs. I appreciated their taking the time to explain *so many* things to me. I also realized that they are *professionals* in every sense, and are dedicated to helping people realize their dreams. Brenda (Peters), Mike (Darwin), and Steve (Bridge): thank you 1,000 times. And excellent work on your displays and table of materials.

All in all this conference was some of the best money I ever spent. If you are reading this, you already have an interest in the future. I highly recommend you attend these conferences. You'll meet a lot of interesting people, learn something new, and maybe someday realize the oldest dream of mankind.

Jim Binkowski
Orland Park, Illinois

* * *

A Lesson In Salesmanship.

by John LaValley

If the question arises; "How relevant can this subject be?", consider this. In recent years, science fiction has acquired increased respectability as a means of predicting what changes we may see in the near future and how they may effect us. This, coupled with the rampantly increasing tendency of government to turn "social engineering" concepts into law, makes it of vital importance that Alcor and cryonics get along not only with science fiction authors, but with Fandom and the general public as well.

To understand what I'm trying to say, it may help to know where I'm coming from. While I was, alas, unable to attend Westercon, I have many friends and acquaintances in Fandom who did. Their comments regarding Alcor and the comments of Alcor members with whom I'm acquainted made for a rather disturbing picture. It was a reading of related articles in the September '89 issue of *Cryonics* magazine that prompted me at last to write this letter. Please bear with me.

Upon being introduced to Alcor (this just before Alcor and Saul Kent's troubles with the Riverside County coroner began), I found an organization of highly intelligent and motivated people. The near absolute professionalism with which they pursued their objectives was marred by only one thing and in his article, Martin Tays hit it right on the head -- religious fervor.

Bear in mind that I use the word "religious" in a broader context than mere deity worship, but rather as a blind faith in something -- anything. Years ago, many people died in Viet Nam fighting for "democracy". Very few actually knew what democracy was. That's religion.

I'll be the first to admit that Fandom has far more than its share of three hundred pound women dressed as "Vulcan Goddesses" and young (and not so young) men who are so engrossed by the latest issue of *Vampires from Centaurus* that they forget to bathe for a week. But at the same time it should be said that Fandom, in the aggregate, is composed of people who possess a higher than normal intellect. And they can smell religion a mile away.

To be fair, I should point out that in getting to know some of Alcor's members and proponents, the religious fanaticism I perceived earlier is gone. What I see now is a high degree of confidence in cryonics and future medicine that is expressed in terms that can appear religious to the uninitiated. It is that appearance that can be dangerous.

Having come to know Alcor better and having read K. Eric Drexler's book, *Engines of Creation*, my wife Carol and I have decided to become full Alcor members. It is in light of these plans that I take the liberty to give some small pieces of advice.

It would indeed be tragic if Alcor were to cut its own throat and those of its members, by extension, through a bad publicity campaign. The Press, with its gross mishandling of the Dora Kent case and Judge Vogel's ruling in the Dick Jones case are but



two examples of how things can go terribly wrong.

First, Alcor should continue with what it has already done so well. That is answering rational (and sometimes irrational) scientific inquiry with rational and scientific response, being sure to differentiate between what is already fact and what is still speculation. In this capacity, Mike Darwin is definitely our man. His responses on the *Larry King Show* were brilliant.

Secondly, Alcor may want to avoid science fiction conventions, at least for a few years. I must confess some responsibility for the apparent debacle at Westercon. I was one of the idiots who told Brenda Peters; "A full display and panel discussion at Westercon? What a great idea!" It was, in fact, a great idea. It simply was not well received, and for that I'm very sorry. If all my advice is of similar value then this letter should be taken with a grain of salt (one the size of Nova Scotia should do).

Be that as it may, other conventions, such as Planetary Society conventions, medical conventions, biology and chemistry conventions, if they exist, could be promising. At least you'll find more scientific types there and less of the Great Unbathed. This is not to say that Alcor will not encounter the same kind of mindless criticism, but at least the room will smell better.

Thirdly, Martin has a good point in his article, Alcor members have no sense of humor. Martin and I both know that's not actually true but it often seems that way when talking to members. At a recent meeting I inundated Brenda with every "death pun" ("it's a grave undertaking," and so on ...) that I could think of. She laughed in spite of herself, although the bruises sustained by my upper arm have yet to heal. The point is that there is tremendous humor inherent in Alcor's unique way of dealing with clinical death. An appreciation for this humor could be a powerful asset in dealing with a harsh critic. If the individual is not actually disarmed, then at least those listening will be less likely to think of Alcor members as evangelists.

Lastly, it may not be a good idea to present life extension first thing to a "prospective member". Sell them on nanotechnology first. Do this for the same reason you would first sell someone on Chrysler Corporation if you wanted them to buy a LeBaron. Describe the many future benefits of nanotechnology, such as manufacturing plate diamond from carbon atoms. Describe Drexler's spacesuit and rocket engine. When at last you do get down to talking about cell repair, do just that. Say "cell repair", not "life extension". Tell how a team of assemblers connected to a nanocomputer can enter an organ, recognize structure, and begin reconstruction till the organ is healed and function restored. Then watch the person's face, listen to his responses. You may need to nudge him along but he may reach the



"life extension" conclusion all by himself. When that happens he's virtually in the bag. When he extrapolates life extension from cell repair *then* you can point to the Alcor displays and say, "And that's what we're all about..."

Why go to all this trouble? If you want a rat to negotiate a maze (and escaping old views on death to reach cryonics is one hell of a maze), don't dump the cheese on him. Let him just sniff it, instead.

The point of the whole thing is this, Alcor must maintain an image, a public front. After all the bad press, going into hiding and being silent are absolutely out of the question. How Alcor builds this image will require careful planning and often herculean patience and tolerance. We must answer scientific inquiry with dignified and scientific response. We must answer lay questioning with clarity and without condescension. We must answer ridicule, criticism, and scorn with good-mannered humor. In short, whenever put to the question, we must answer with that rarest of human virtues, wisdom.

To paraphrase Kipling, if we can keep our heads when all about us are losing theirs, then perhaps, as the popular Fannish slogan suggests, we may live *long* and prosper!

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Alcor Versus The World: Reflections on Alcor at Westercon

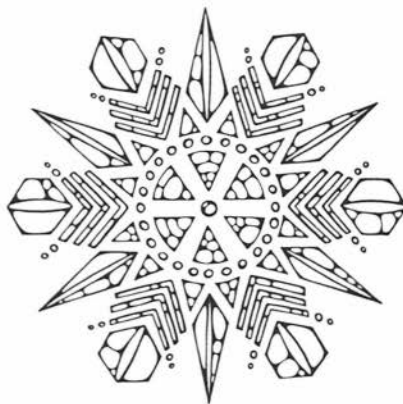
by Mike Darwin

I have read with interest what Brenda Peters, Martin Tays, Brian Wowk, Steve Harris and last but not least, John LaValley, have had to say. I agree with all of them. How is this possible? Bear with me, and I'll try to explain.

First of all, Brenda, Brian, and Steve are right on the money in their characterization of Fandom. All their observations ring true and confirm experiences Steve Bridge (Alcor's Midwestern Coordinator) and I had years ago at Northamericon and Chambanacon in the Midwest. SF people are not our best market, and given the limitations we have in terms of time and money, we would better focus our efforts elsewhere. I would not have staged an effort at Westercon, but even still I do not think it has to be a failure for us if we listen to what Martin and John have to say.

Alcor people often *do* come across as religious zealots and I believe this diminishes seriously our effectiveness. I have overheard two particularly rabid cryonics zealots (one male, one female), saying things while overcome with emotion that even embarrass *me*. When I cringe, things have really got to be bad!

Using high-pressure tactics like imploring young women to feel guilty over the death of their yet unborn children and telling people they are "stupid" if they don't sign up for cryonics doesn't win points with anyone. One of the things I've had to learn the hard way is that strong emotion is something that has to be used like chemotherapy: only when there is absolutely no alternative and



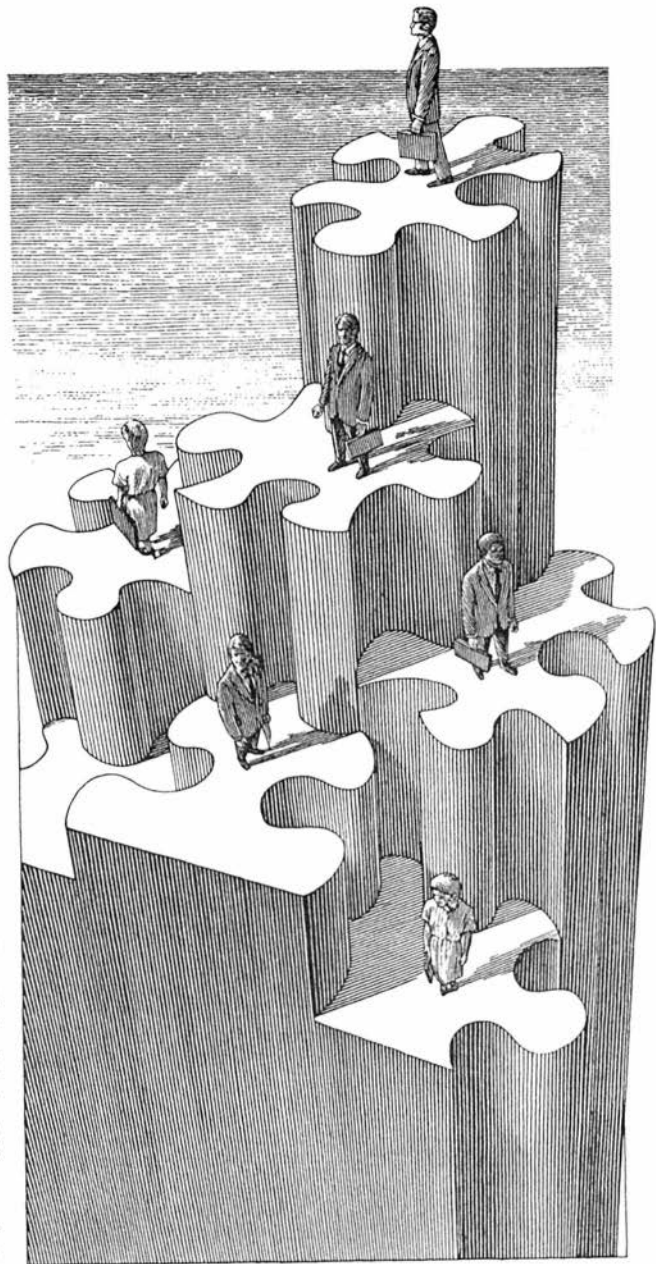
then no more than is absolutely needed to get the job done.

I used to think that showing strong emotions demonstrated commitment. And it does. But not necessarily the kind you think it does. Most folks take it to mean commitment to a mental institution. I have a long way to go to learn better control in this area myself. But I know enough already to see it in others and to see how incredibly inappropriate and counterproductive it is.

I recently spoke to the Nanotechnology Study Group at MIT. I had a large audience and the presentation went very well. I felt it was one of the better performances I've given: the questions were excellent and challenging and I had good answers for all of them. But at one point during the Q&A I got carried away emotionally. I showed strong emotion and answered several questions passionately. Later, nearly half a dozen members of the audience came up and expressed distaste at this in various ways. Their comments were good ones. One fellow told me that my display of such strong emotion had made him rethink signing up with Alcor (which he had been ready to do). Zealots were not what he had in mind as being the "right stuff" to get him where he needed to go.

When I later replayed the evening in my mind, I realized that the negative criticisms I received were right on the money. Strong emotion is sometimes needed and we should be unafraid to use it when we have to. But those times are few and far between. It should be reserved for times of crisis or celebration. Losing your cool or exhorting people just causes bad reactions.

Anyone who has ever been accosted by fundamentalists with hand-bills pleading sincerely and emotionally with you to accept Jesus



should understand this completely. I agree with Brenda and Brian about the emotional importance of cryonics and I even agree that the issue is a life or death one. Given this context, accosting people emotionally and using high pressure, emotionally-loaded arguments on them may even be theoretically appropriate in the sense that the issue is an intense, emotionally charged one. But it is not a practically appropriate thing to do. Strong emotions, intolerance, and zealotry just result in alienating people. Period.

In my media and public speaking appearances I am striving more than ever to achieve emotional control in a natural, relaxed, and even humorous way. I will not suffer stupid criticism or belittling of Alcor or cryonics, but neither will I froth at the mouth or become too emotional. I am trying to be reasonable and show the right amount of emotion to prove I care, *without overdoing it*.

I believe that the key to doing this is a change in attitudes about cryonics and Alcor. I have experienced such a change myself and I think others in Alcor could profit from it. In the past I felt it was my sacred mission to save every life and bring the good news of cryonics to everyone -- whether they wanted it or not. I no longer have this attitude. Increasingly I have come to realize that my responsibilities don't extend that far and that people are more intelligent than we have perhaps given them credit for. There are, as it turns out, many very good and perfectly reasonable reasons why people don't "see the light" and sign up. And there are fundamentally only two ways to try and overcome those reasons: emotional exhortations or a careful analysis of the reasons why we are not communicating our message and appropriate changes in our approach.

Going to Westercon the way that Alcor went there was doomed to failure. If we want to tap that market we have to truly be a part of it and relax a whole hell of a lot more than we have. I don't think we should do that because I agree with Brenda's, Steve's and Brian's analyses. Most of those folks just aren't worth the effort -- not right now anyway. On the other hand, we have to realize that the fault in not finding recruits there was mostly ours, not theirs.

And I'll give you a couple of examples to "prove" it by citing changes in our approach in other areas that have been enormously successful:

For years people "turned off" on cryonics before we could even complete our first sentence. Why? Because of what we said about ourselves: "Cryonics is freezing *dead* people in the hopes that they can be restored to life by future medicine." That sentence was a recipe for failure.

Due largely to the efforts of Brian Wowk, we are now very careful to point out the difference in cryonicists' definition of death versus contemporary medicine's. We now tell them up-front that while medicine uses function-based criteria for pronouncing death (absence of heartbeat, breathing, brain functions and so on) cryonicists use a structure/information based *criterion*. This is an incredibly useful change in our approach. Why?, because it does several very important things for us:

First, it lets us point out that before CPR and defibrillation doctors pronounced drowning and heart attack victims dead because medical technology was not good enough to restore them to function. But were those people *really dead*? No, of course not. Medicine was just mistaken in labeling them as such because it couldn't fix them. Similarly, today's medicine very likely pronounces people dead incorrectly because tomorrow's medicine is likely to be better and more capable. Thus, you're only dead *when it is no longer possible to infer the healthy functional state from the nonfunctional state*.

Second, it lets us step around the religious questions like where someone's soul goes. Well, if they're not *really* dead then why should religious issues even be of account? Where is a frozen embryo's soul? A frozen embryo isn't "dead" just because it's in suspended animation. And neither is a frozen patient.

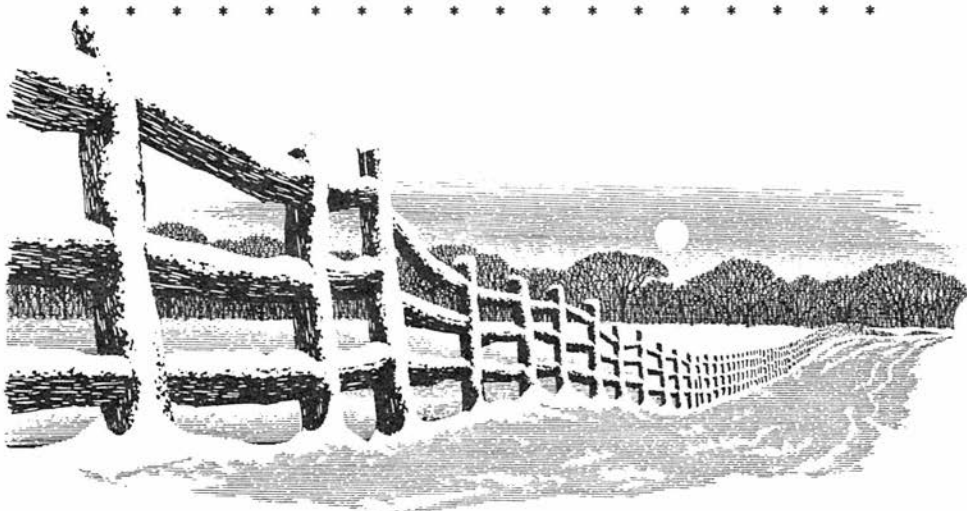
Third, it gets around the negative imagery that results from associating cryonics with "death".

Well, it all seems so obvious now (and yet several key people inside Alcor were (are?) opposed to such change). We now do radio shows with this kind of approach and the religious objections just aren't the problem they used to be. People also aren't as "freaked out" over the issue of death and "resurrecting corpses". They may not agree with us, but they're not up in arms anymore. And that's no small thing!

The point is, we made a change that acknowledged some basic and deeply ingrained things in people which we can't expect them change. And the results have been enormously beneficial.

Unfortunately, we have a long way to go. Much of our marketing is too cold and clinical, too technophilic. We have to project a more human image if we want more success. Similarly, we have to learn to be more reasonable and leave our strong emotions at home when we go out to pitch Alcor. We want to project an image of thoughtfulness, competence, rational commitment and above all *emotional balance*.

We need to target ourselves on markets that are going to be more rewarding than SF fans. But we also need to realize that the revulsion exhibited by SF fans is very understandable. In fact, we should be thankful that SF fans are as socially "inappropriate" as they are. Out of the mouths of babes come great truths. In this case we have been told something that others were, I'm sure, just too diplomatic to say: We need to cool it.



SHE WHO HAS THE LAST LAUGH

by Mike Darwin

photos courtesy of Indianapolis Children's Museum

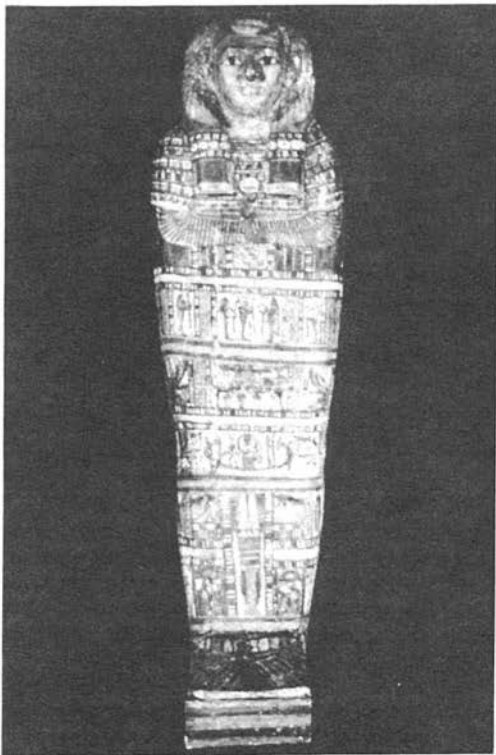
Place me among the stars imperishable, that I may live forever.

-- Egyptian Book Of The Dead

* * *

Indianapolis, Indiana, the town where I grew up, has the distinction of having the world's largest Children's Museum. But it was not always so, and when I was a child the Children's Museum was crammed into a very old, very Victorian mansion on the North side of town. The new Children's Museum is incredibly spacious, with a high technology look. The collection is now spread out over vast halls and rooms, with much of the space being custom-tailored to the items housed. It's all very nice. But frankly, I liked the old Victorian house on North Meridian Street a lot better. There was something special about the crowded old building, and the density of the exhibits made them far more visually interesting and contributed powerfully to the feeling of being in the presence of antiquity.

By far the most interesting exhibit in the museum to me was (and still is) the Egyptian mummy. I remember my first grade school visit to the museum only vaguely, with one exception: the mummy, tucked away in a chilly upstairs room, separated from the



curious eyes and eager hands of a room full of nine-year-olds by a sheet of glass. Her name was Wenu-hotep. The display card said she was only 19 or 20 when she died 2500 years ago, and from a historical standpoint she was nobody important; just the daughter of a minor priest. Wenu-hotep is an "unopened mummy". She lies in state untouched in her gilt and painted sarcophagus, marooned in time, quietly waiting out the centuries.

Wenu-hotep was not bedecked with opulent wealth. No history books recorded her passing. But she *was* loved: her sarcophagus was solidly made and well decorated -- her image is brightened by a thin film of precious gold foil over the delicate features of her face. Her mummification in this fashion was not a trivial thing in the time in which she lived. Virtually all of the savings a man might acquire in a lifetime would usually be required to pay for the cost of his mummification. The average man of modest or middle income would have to budget quite carefully to be able afford the cost of mummification.

To most of us now alive, this seems strange. If we contrast mummification with cryonic suspension, it is hard to understand how a procedure as simple as mummification

could have represented such a large fraction of someone's economic life -- even 2,500 years ago! But it did. And it did so because the ancient Egyptians, despite their tremendous philosophical, artistic and agricultural achievements, were, by our standards very poor. If we examine a few of the key elements in mummification in the economic and social contexts of the times, it will become readily apparent why it was such a costly procedure.

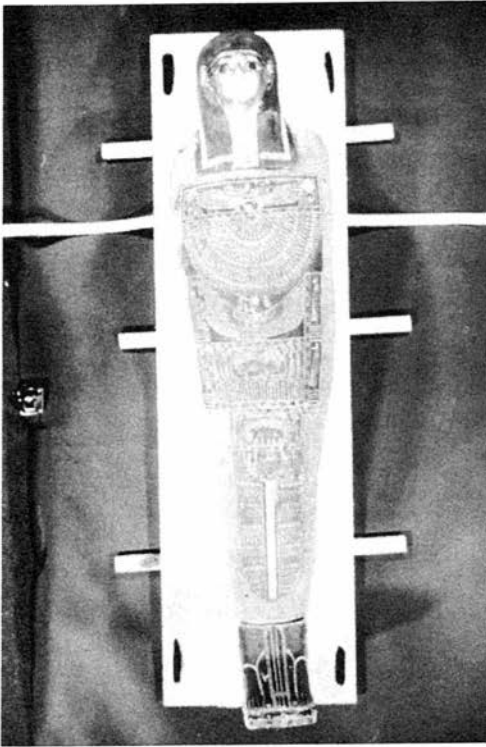
First of all there is the issue of the simple and direct labor involved in preparing the body. For a good job of mummification this required 70 days. During this period the body was disemboweled, the brain and lungs were removed (but never the heart, which the Egyptians considered the seat of the soul) and the body was subjected to progressive drying by packing with natron (a bicarbonate-rich salt mixture) and sawdust or other water-absorbent material. Certain prayers and rituals were also carried out during this time, and this required the efforts of priests: a costly proposition. Finally, the body was cosmetized and given a final preparation for wrapping and packaging in the sarcophagus.

Even today such a procedure would be fairly-labor intensive. But what's important to understand about ancient Egypt is that labor was important; it was scarce and precious, not because people were unwilling to work in service industries (as is often the case today), but because the per capita productivity of a man was very low. There were no factories, pesticides, electricity, or antibiotics. A hard day's work returned only a tiny fraction of the productivity we take for granted it will yield today. Labor was scarce because agriculture and "manufacturing" were so inefficient. It took all the effort a man could put out just to eke out a living for himself, and that was presuming he had the help and support of his family. There was also disease. A very high percentage of the population was afflicted with one or more parasitic illnesses and/or infectious diseases. As a consequence, productive lifespan was far shorter. Indeed, the mean lifespan has been estimated to have been as short as 30 years in Egypt during the period when Wenu-hotep lived.

If we consider the cost of the materials used in mummification, the high cost becomes even more comprehensible. On the average, 400 yards of linen cloth was used to wrap a mummy. There were no high-speed looms or textile factories. Fabric was produced by hand, from hand-carded cotton, which was picked by hand from fields which could not be used to produce food -- because they were growing cotton instead. And keep in mind there were no agricultural hybrids or high-yield crops. At the time Wenu-hotep lived agriculture was in its infancy.

Of course her sarcophagus was entirely hand-hewn and hand-decorated. Even in today's economy, if you were to walk into a fabric store and buy 400 yards of high quality linen, contact an artisan for a price on a hand-carved and painted sarcophagus, and chat with a mortician about charges for the use of his facilities and services for 70 days, you might discover that even today *you* might not be rich enough to afford mummification (Indeed, mummification similar to that practiced by the Egyptians is available today from *Summum*, a quasi-religious organization based in Salt Lake City, Utah. Summum quotes a minimum price of just over \$100,000 for the service!)

The point of all this is that 2,500 years ago the human race was operating at a minuscule fraction of its current economic efficiency. People were often sick, much of the meager agricultural output was eaten by insects or spoiled (no refrigeration or canning) and there was virtually no automation or manufacturing to increase production of goods and services. It's important to understand this as cryonicists, because when we come back from suspension we will have come back from a world very much like the one the Egyptians of two and half millenia ago lived in -- at least as compared to the wealth and



technical sophistication of the world we will have come back to.

In short, someone cared a lot about Wenu-hotep. Cared enough to spend a big hunk of the average "middle class" ancient Egyptian's lifetime productivity on preparing her for immortality.

Some of this was explained to me as I stood awe-struck in front of Wenu-hotep's mummy. I remember being terribly impressed that someone cared for her, even though she was dead. I remember quite clearly, looking down at her sad but peaceful face and asking one of the stern nuns, who oversaw the field trip, why her eyes were open, since all the dead people I'd ever seen had their eyes closed (which involved, even at the tender age of nine, quite a collection of elderly relatives). It was then that I learned something quite remarkable. The Egyptians believed, really believed, that mummies were alive after death. As alive as you and I. That they ate, drank, worked, and played just as they had in life.

What the nun actually told me was that the Egyptians were pagans, who knew nothing about heaven or hell and that they had the primitive notion that if they preserved their physical bodies after death, they would go on living, just as they had in this life, only "kind of in another dimension, so they wasted all those valuable resources preserving dead bodies." Something in the old nun's voice reeked of condescension and contempt, although she was quick to point out to the class, with laughter in her voice, that since the Egyptians lived a long time before Christ, their paganism wasn't their fault and they would go to Limbo (instead of Hell) where they wouldn't get to sing hosannas (*Heb.* "pray, save us!") all day, but where life would be very comfortable. (I remember wondering at the time if people got to eat and watch TV in Limbo, and if they did maybe there might be some way I could go there too, so that I didn't have to miss Popeye cartoons for the rest of eternity.)

I was only nine at the time, but I can remember feeling very strongly that something about what the old nun told me was *wrong*. Somehow it did not seem a waste to me. Somehow, Wenu-hotep, lying there in front me, wrapped safely and lovingly 2,500 years ago seemed tangible and undeniable proof of some kind of triumph rather than failure. I remember feeling with certainty "at least they tried, at least they cared." What I *didn't* feel was that the good sister was being *fair*.

That experience, and a few old movies, began a love affair for me with ancient Egypt which has lasted to this day. I can see Wenu-hotep as clearly now as if it was yesterday, and I've never forgotten her. When I return to Indiana I always make it a point to drop by the Children's Museum and visit her.

She's in a new room now, a room built especially for her and decorated more opulently than her simple rock-cut tomb ever was. She lies in state surrounded by Ushabti figures

(clay figurines of workers and servants to do her bidding in the afterlife) and the modern accouterments necessary to maintain her humidity and temperature at arid, preserving levels. The title of her exhibit is, appropriately enough, *Ancient Egypt: To Live Forever*.

The old nun who guided the eager group of nine year olds through that exhibit is probably dust and moldering bone now. Her heaven, hell, purgatory, and limbo have been reorganized by Vatican II. Indeed, purgatory and limbo have vanished altogether -- replaced by more "sophisticated" and I might add, even more nebulous views of the hereafter.

In the years since Wenu-hotep and I first met, I have become an avid student of Egyptology. I have read many of the works by the classic Egyptologists; everyone from Budge, to Breasted, to Howard Carter. Despite the fact that many of these men loved ancient Egypt and dedicated their life to studying it, they share one attribute in common with that elderly and ignorant nun from my youth; both, often condescendingly, regard the ancient Egyptian's religious and funerary practices as primitive and naive. The condescending attitude of Egyptologists toward the commitment of the ancient Egyptians to the afterlife as physically continuous with this life is nicely illustrated in a quote from E.A. Wallis Budge's commentary on *The Egyptian Book Of The Dead*: "The life of the Osiris of a man in heaven is at once material and spiritual; and it seems as if the Egyptians never succeeded in breaking away from their very ancient habit of confusing the things of the body with the things of the soul."

I have often found this bias in the *archeologist's* writings primitive and naive. Almost to a man both the classic and modern Egyptologist writers and scholars have remarked on how life-loving the Egyptians were. They were a people in love with life, a people who, despite the hardships of their times, were basically optimistic, life-loving, and positive. (The same can be said of us as cryonicists). Their conception of an afterlife as a positive and improved extension of *this* life was a highly detailed one. It demonstrated an appreciation for worldly life which has been found in no other religion before or since.

From my perspective as an adult I've often thought about the contrast between the average ancient Egyptian and the average Christian (or Moslem for that matter). The average Egyptian could tell me a great deal about what he anticipated and expected his "afterlife" would be like (but you see afterlife is a misnomer here -- since life after death was just more life). The average Christian would be far less specific. The educated Christian would be able to tell me nothing at all. What *does one do in heaven on a Tuesday afternoon?* Call him unsophisticated, but at least the average Egyptian knew exactly what to expect when he checked into that "other dimension": he expected life to be pretty much like it was in this one, *only better*. Not a bad place to start with expectations, and it beats the hell out of an eternity of singing hosannas.

The Egyptians were sensible, level-headed people with very positive, life-affirming values. They produced great and sensitive works of art, and they created many ideas which have been the underpinning of every civilization which has followed them (including modern techniques of naturalistic art and the idea of monotheism which dominates much of both contemporary Western and Islamic religion). They approached the problem of dying in a similar direct and natural fashion. As much as possible they fought death in the real world, here and now, and used mystical answers as supplements to the hard and costly physical work of preserving their dead.

Christians and other modern religious groups tend to equate the ancient Egyptian's preservation of the dead with a failure of the ability to visualize abstracts such as an

ethereal afterlife in heaven. Maybe they are right. But the Egyptians didn't have to pay the price the Christians paid when they gave up the body for the soul. They were never poisoned by the concurrent and inevitable notion that the human body, this life, and this world were somehow inferior, inadequate, cheap, and beside the point. Their unwillingness (some would say primitive inability) to give up the reality of the life they knew and understood, kept them firmly planted in the real world. As a consequence the Egyptian civilization lasted 3,000 years. It is a record of stability, sanity, and productivity unequaled by any civilization that has come before or since.

I believe the durability of the Egyptian civilization was in no small way related to the commensal and life-loving nature of its people and their philosophy. Their commitment to this life implied far, far less opportunity for self-destructive ideas to infiltrate their culture. Self-immolation as a cultural concept was totally alien to them. Eternal life was tied to *physical procedures and physical wealth involving the physical body in this world*. That put a lot of constraints on them culturally. It meant that their civilization had to be structured in a certain way -- a very stable way. One does not accumulate wealth, cut rock tombs, wrap bodies in linen, or cover hand-carved sarcophagi in gold and art unless one has a stable economy and a stable social framework. By contrast, Christianity and most other religions have their concept of values and the afterlife split off from this life in a very schizophrenic fashion which permits human beings, human goods, and the world at large to be expended, destroyed, and mutilated as long it can be argued convincingly (and often unconvincingly) that such actions serve "otherworldly" ends.

I've also come to realize something else. To the extent that the Egyptians were anchored to this life and were able to preserve their physical bodies, they will probably succeed in their goal of achieving immortality. At least those that survived will. And not many survived.... (Consider that approximately 700 to 900 million Egyptians were mummified.)

In ways my nine year old mind could not begin to fathom, Wenu-hotep, lying quietly there *was a tremendous accomplishment*. What I did not know, but what the Egyptians suspected, turned out to be true after all. A man's physical body was important and it was an essential ingredient to continuing with life and experiencing death as just an interruption. To a surprising degree, the Egyptians, a few of them at least, may get their wish. Some part of what they were may once again walk the earth, smell the breeze, see the Nile, watch the setting sun.



Let's consider Wenu-hotep and ask what will be possible and what can realistically be done for her given the same kind of technological progress we anticipate for our own revival from cryonic suspension.

Scattered throughout Wenu-hotep's body are the dehydrated remnants of cells. There is probably almost no intracellular architec-

ture left anywhere in her body. The crudities of 70 days in the sun and powdered salt bath have probably wiped out that level of information almost completely. But many of the proteins that made Wenu-hotep up are still intact. The odds are excellent that you could tell her blood group, her infectious disease history (from antibodies) and perhaps a couple of her tissue enzyme levels. The odds are also fair that scattered here and there amongst the debris of once-living cells are intact DNA fragments. Their survival will be a matter of "chance". Tucked away here and there will be little intact strands of the information which once described the genome of Wenu-hotep. With time, patience, and very sophisticated computing tools there is a reasonable probability that those strands and fragments and bits and pieces can be put together into a complete functioning human genome. In short, it should be possible to clone Wenu-hotep: to produce an individual with Wenu-hotep's genetic make-up.

This is hardly immortality, and no cryonicist would be very (if at all) satisfied with such a low degree of fidelity. Although, I should pause here to point out that recent behavioral studies of identical twins have demonstrated that to a stunning degree genetic make-up shapes behavior. Twins separated at birth and reared in complete isolation from each other very often mature into adults who choose the same careers, marry the same kind of spouses, and even (incredibly enough) wear the same kind of jewelry in the same way. This may indicate that the texture of our consciousnesses and "identities" is far more strongly rooted in our genome than we currently believe.

But neither Wenu-hotep nor we have to settle for such a low degree of fidelity in the resurrection. Why not? Because we have a great deal of information about Wenu-hotep. Much of it is rather "general" information, but, handled properly it can be made quite specific. Let's look at how we might go about reconstructing her and what such a reconstruction might yield from a subjective standpoint: Wenu-hotep's.

We know a fair amount about Wenu-hotep's time in a general way. We know a good deal about her language, so we can give her that: as much of her spoken tongue as we know -- and the ability to read hieroglyphics. We know she had a mother and a father and we know the position her father held. We can give her vague memories of a father, loving but indistinct, and we can couple those memories to the tools of his trade. She will know that her father was a priest, and that he loved her. She will have vague images of a man of such and such a height (inferred from her height and heredity) dressed as priests dressed, but she will not be able to fully resolve his face. She will have flavors of foods she will have eaten, she will recognize utensils which she must have used, the odors of perfumes that were in use at the time, the sight of the sun setting on the Nile. She will know how to apply kohl to her eyes, how to dress herself and comport herself. She will have memories of domestic animals, of their uses, of men and women at work. In short, she will have a rich, albeit incomplete storehouse of memories. She will know her name (and to the Egyptians, a man's name was *his identity*.)

As much as we can make her so, Wenu-hotep will be a young Egyptian woman of circa 700 B.C. There will be areas of amnesia, and she will remember few specifics about her past. In this respect she will be much like a contemporary amnesia victim. Her skills and language memory, her procedural memory will be largely intact, but her memory of persons and the minutiae of her past life's history will be vague and sparse, her declarative memory will not have survived very well.

But she *will* know who she is. She will know she is an Egyptian, she will have pride in that fact, and she will be stunned by and in awe of the world she has emerged into. She will remember the broad outline of her final illness and she will realize that she has entered the afterlife she was promised.

And that "afterlife" will not, in any fundamental sense, be greatly different from what she was led to expect. The gods who gave her life will be surprisingly human in their strengths and weaknesses (because they *will* be surprisingly human). Some of them will even be incredible combinations of man and beast, although not in the way that Wenu-hotep probably thought of them; but rather as mixtures of DNA and molecular machinery.

Wenu-hotep will have been reborn into a world where she can fly through the air, talk to people over great distances, eat unimaginable delicacies, and have tireless servants perform her labors for her. It will be a difficult adjustment for her, but it will be one she will have all the time in the world to make. She will have gotten her wish: Perhaps the most poignant of the lines from the text of the *Book of the Dead* is the one begging the gods to "place me among the stars imperishable, that I may live forever". In a very literal sense, Wenu-hotep will have gotten her wish. By the time the kind of "resuscitation" envisioned here for her becomes possible, we will probably be on our way to the stars and be living and working in deep space.

It will no doubt take a long time to convince and educate the primitive and superstitious mind of Wenu-hotep that there are no gods of the Nile. That her life and its resumption are a result of the vagaries of chance and the determined effort of a few *people* who cared. But, if she refuses to believe it, even as she comes to understand the mechanics of how it was done, how far wrong would she be? For she will not have been revived by "men", at least not the kind of men who walked the earth when "she" did. No, these men will have more in common with Osiris than with any ancient Egyptian. Like Osiris they will have gained their skill at conferring immortality from learning to put together the ravaged fragments of their own corpses, so they might live again. And, like Osiris, they will be motivated to live *this* life, forever.

You may be wondering now who would attempt such a fantastical thing. Who would undertake to restore a 2,500 year dead Egyptian girl to life, and more importantly, why? The answer to both questions is simple: *I will* and I will do so because she asked for it to be done and *because it will be easy for me to do if it can be done at all*.

Will it really be Wenu-hotep? That's a question for philosophers and psychologists to answer. Perhaps those answers will be in place by the time such an attempt is possible. Perhaps the answers will dissuade me from ever trying.

I doubt it though. Wenu-hotep has waited a long time. The loving and tear-filled eyes which sent her on her way so long ago sent with her a message to the gods as well. The essence of that message was "give her as much of your life as you can, make her as godlike as she can be made. Take her heart, take her essence, and give it life. Do the best for her that you can."

Whether we like it or not, we are the gods. We can fly through the air, "resurrect" the "dead" and stitch on severed limbs. It is an awesome responsibility. So awesome that even though the odds may be great that the young woman who opens her eyes "after" 25 centuries years will *not* be Wenu-hotep, I feel obligated to try.

If it *is* Wenu-hotep, then all the sneering Egyptologists and condescending nuns will be mere footnotes in history. *She* will be alive, living in the very world she left but a "moment" before.

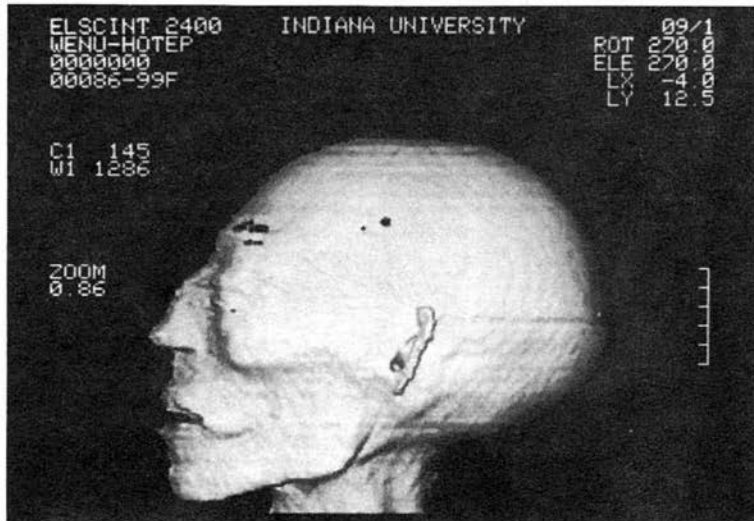
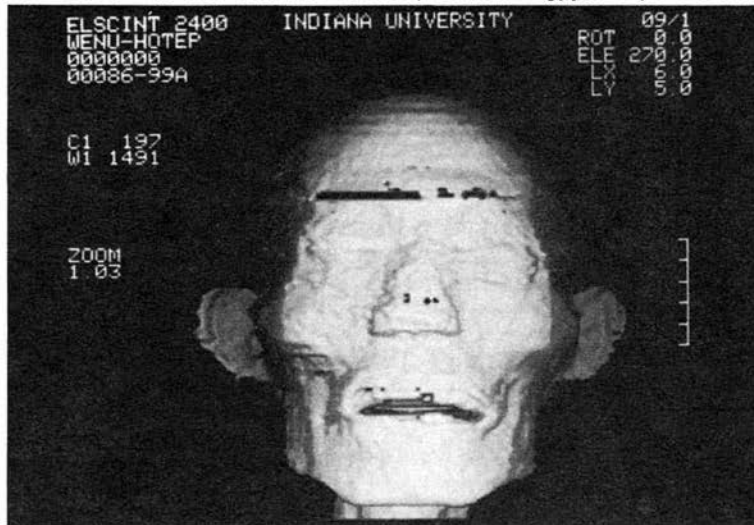
She will have had the last laugh after all, and she will have the prospect of an eternity of laughter ahead of her.

She who laughs last, truly laughs best.

POSTSCRIPT

On October 10th of 1989, some three years after I wrote this piece*, I found myself once again in Indianapolis, Indiana. As I usually do, I stopped in at the Children's Museum to visit "Winnie", as they affectionately call her there. To my dismay and horror her exhibit was gone. After some uneasy searching and a few inquiries I found her unceremoniously tucked away in a diminutive glass case in a corner of the hallway on an upper level of the museum. Gone was the beautiful exhibit, *Ancient Egypt: Life Forever*. Next to Winnie was a TV with a canned tape running in an endless closed loop. Hardly what I expected.

And much, much more. It seem Winnie has had an interesting time since I saw her last. It started with a decision to close her existing exhibit in order to relocate and expand it elsewhere in the museum. Field Museum (Chicago) Egyptologist Frank Yurco was called in to carry out a detailed reading of the hieroglyphics on Wenu-hotep's coffin. Yurco's readings provided a wealth of heretofore unknown information and resulted in a "break-through" of sorts. It turns out that Winnie's father was Hor-em-hat, one of the most powerful Egyptians of his time, and yet previously unknown to Egyptologists. Previously, Wenu-hotep and her family were thought to be of only minor importance. However, Yurco's research indicates that her father was a high priest



* This article was on a diskette seized by Riverside County Coroners on their raid of January 12, 1987. It remained in the custody of the Riverside Police Department (RPD) until August of 1989. Since the only copy of this article was the one which existed on the diskette in the RPD's custody, publication of the article was delayed for nearly two years.

of Thoth, the most important deity of the time. Hor-em-hat was also an administrator, probably in charge of the distribution of food and grain.

Winnie also turns out to have been a woman of wealth and power in her own right. She is identified on the coffin as "Lady of the House" indicating that she was a married woman. Her husband's name was not mentioned. Women were granted equal status to men in ancient Egypt and Winnie's status, as indicated on her coffin, was her own, independent of her husband's.

Yurco's research also indicates that Winnie lived about 200 years later than was previously thought, somewhere between 525 - 400 B.C. She is also pictured on the coffin as wearing a Persian-style robe which is indicative of the fact that she was living in Egypt at a time it was under Persian rule.

Examination of Wenu-hotep was not confined to her coffin. While she was off-display a decision was made to have her CT-scanned using the new 3-dimensional CT scanning equipment available at Indiana University Hospital in Indianapolis. Radiologist Ethan Braunstein is one of three or four physicians in the U.S. with extensive experience in radiologic examination of mummies. The clinical application of 3-D CT scanning is only 3 years old, and very few medical centers have the capability. On September 10th, 1988, Winnie became the third mummy in the U.S. to undergo the process.

A substantial amount was learned from this operation. Perhaps most startlingly, it was discovered that Winnie was not an 18 year old, as previously thought, but rather was a mature woman who was between 30 and 40 years old at the time of death. Her face is also intact (although her two front teeth are missing), albeit somewhat desiccated from the mummification process. As the 3-D CT scans which accompany this article attest, it has been possible to very accurately reveal her face. The image is close enough to the living Wenu-hotep that museum and forensic artists have produced a drawing and a three-dimensional bust of what she looked like in life.

The CT scan also revealed two bizarre and unexpected findings: Wenu-hotep's heart has been removed from her chest, and there are four packages of desiccated internal organs which have been returned to her body cavities. These findings are unusual because the Egyptians considered the heart the seat of the soul and were at pains to repair it in the event it was injured. That her heart should be missing is almost unbelievable! Secondly, organs were normally removed and placed in separate Canopic jars for storage outside the body. This is one of the first times that organs have been found to have been returned to the body during mummification.

As this postscript indicates, once again technology has revealed a bit more of Wenu-hotep's story and thus of her identity. Indeed, it has given us the capacity to peel away the veil of centuries and look directly into her face, greatly humanizing her. As the press release from the Children's Museum aptly notes: *"Keeping Wenu-hotep intact means she's ready to be studied by whatever new technology appears 10, 20 or 50 years from."*



Little do they know.

"HARD BOILED DEFECTIVE STORIES"

by Mike Darwin

If you like the bizarre we've got a book for you. It's called *Hard Boiled Defective Stories* and it's by cartoonist Charles Burns. Published by Raw Books (Pantheon Press, a division of Random House, New York, 1988) it consists of a series of comic sequences dealing with the adventures, or should I say misadventures, of a detective by the name of Al Borbah, whose face resembles nothing so much as a mask. The art has a 1950's or perhaps even a 1930's WPA feel to it and the subject matter is truly bizarre -- including even cryonics. The cryonics sequence is called "Living in the Ice Age" and concerns the trials and tribulations of a young widow by the name of Janet Skank. It seems Mrs. Skank's elderly husband had been frozen by the Snowboy Cryonics Institute... and Snowboy is under investigation for possible fraud. The poor widow Skank stands to lose her allowance if Mr. Skank isn't well cared for. The widow Skank needs a detective to get the lowdown and safeguard her inheritance...

What's interesting about this sequence isn't so much the story line, its the art. Burns produces some striking images and many cryonicists will find them visually intriguing as well as funny. Please note that I am *not* recommending this book. It is clearly not for everyone and probably not even for the vast majority of cryonicists. But for those readers who collect cryonics books and articles and/or for those with a love of comic art, this book is a must. The "neurosuspension" sequences are especially funny in a macabre sort of way.

The other thing worth mentioning about this book is that it is enormously popular among high school and college age people. The first edition sold out very quickly and I had to wait several weeks for the book to come in on back-order. So, for good or ill, a lot of young people are being introduced to the cryonics idea. And at least in the *mondo bizarro* world of Charles Burns, cryonics actually ends up working!

LESS THAN THREE MONTHS LATER MY HUSBAND SAM DIED
IN HIS SLEEP. A CREW FROM THE SNOWBOY CRYONICS
INSTITUTE HAD HIM FROZEN MINUTES AFTER HE HAD
BEEN PRONOUNCED DEAD.



SCIENCE UPDATES ON MEMORY

by Thomas Donaldson

ESSENTIAL CALMODULIN

Our understanding of how memory works has advanced tremendously over the last 10 years. Even so, many cryonicists may feel this speed to be a glacial creep. But science, which is not computation or simulation, can only work at these speeds. Every experiment adds at most a sentence to the story, when what we are trying to make is an encyclopedia. Single cells are very complex, which means that we can't attain a true description of the cell in just a few words. Above that, assemblies of cells bring on another order of possibility, above that we have organs and then a whole multicellular creature.

Why then does it take so long? Because to search out the truth we must deal with a multitude of *possible* truths, far larger than the one actual truth. Many possible truths must be tested and found wanting. When neuroscientists someday write the textbook on memory, all of these possibilities will vanish. Instead we'll have a short book, laying out what we know about how memory works, in detail, each statement containing years of study.

It is as if we were presented with a computer program with no manual nor any indication of the machine for which it was written or the purpose for which it was intended. Our Creator has done almost the same for us, except for the Manual. But it's even worse. When opened, we find the Manual is packed exclusively with vaporous self-serving nonsense.

It's with these thoughts in mind that we should read what is really a very interesting paper by Roger Nicoll and others from UCSF (*Science*, 340, 554 (1989)). They have closed off one significant realm of possibility among the many.

I will explain some of the truths that have been found so far. First, nerve cells pass messages to one another at points where they almost touch, called synapses. They pass these messages chemically, through a large number of chemicals (some of which our body also uses for other purposes) we now call neurotransmitters. About 10 years ago scientists discovered one very interesting phenomenon, *long term potentiation* (LTP for short). LTP names a characteristic change in a synapse, which will afterwards transmit messages more easily between the two nerve cells. Most important, LTP consists of a synaptic change which will persist, at least for many hours and conceivably for much longer (the "long term" part). LTP doesn't happen with just one message. Repeated messages, occurring together, with cause it. Once they found it, scientists immediately started thinking about memory.

The possibility behind this work is also simple: would this change be enough to explain memory itself? Evidence in favor has built up over the years. Even though strict logicians might quibble, I think it fair to say that proof that LTP was somehow quite *unrelated* to memory would astound many neuroscientists.

To suppose that LTP produced memory leaves many more possibilities for study. How is LTP itself produced? Nicoll and his coworkers have found a few answers to that.

One of the most important points about LTP is that nerve cells in culture will show it. A wide range of experiments become possible on cells in culture. Nicoll and his coworkers studied LTP on cultured nerve cells, placing chemicals into the nerve cells and measuring their electrical activity by very fine pipettes directly inserted into the cells

at the synapses of interest. Their technical skill must have been at the top of what we now can do.

Other scientists before have shown that LTP happens when some special proteins are modified by attachment of phosphate. The proteins in question aren't clearly known; we know that this process is involved because when LTP occurs the cell uses an enzyme which does this (such enzymes are called kinases). The particular enzyme is known (but little seems known about it). In the nerve cells of interest the enzyme needs calcium ions to act. How they use the calcium ions was not known at the time of the experiments. The enzyme is called "calcium/calmodulin protein kinase II" (CaM-KII), which says no more than what I've just said.

The nerve cells Nicolls and his colleagues studied used glutamate as a nerve transmitter. When LTP happens receptors in the cell membrane at the site of the synapse would open pores (the NMDA receptors) to let calcium ions enter the cell. This would allow the kinases to modify the target proteins, by some means. The experiments of Nicolls et al aimed to characterize the exact path by which this happened. At least two possibilities existed. An enzyme, calmodulin, which is involved in other reactions involving calcium and kinases, might be involved here also. Again, it could be another enzyme, calpain, which breaks down specific proteins, again when calcium is present.

In brief, Nicolls and his colleagues present strong evidence that calmodulin rather than calpain is the enzyme needed. They could inhibit LTP by injecting inhibitors of calmodulin directly into the synapse. They could also stop LTP by inhibiting the protein kinases. The paper contains a good deal more data buttressing their conclusion.

Of course we don't know that LTP with other nerve transmitters like acetylcholine works this way. No one can give an account of how the enzyme's structure produces these results, or how the other enzyme involved, calmodulin, might be involved as a nanotechnological machine. We know that they are there and that without them, and calcium ions, LTP will not happen.

By attaching phosphate, the kinase will change the structure of its target chemical. Since we are discussing nanomachines (except for the absence of the Manual described above) this attachment will certainly change its properties. By its effects we know what this change does but not yet why. However we also know something else. On the receiving side of a synapse, the cell membranes become thicker (this is called the "postsynaptic density"). It is exactly this kinase, CaM-KII, which composes 20% to 40% of the protein in these structures. CaM-KII must therefore be very close to memory itself (see the following articles).

Right now, with routine techniques, we can find out the structure of biological chemicals like CaM-KII. We can also discover their targets and the structure of their target. But we could hardly expect to understand memory by simply starting to sequence and specify every known molecule in nerve cells (i.e., molecule1, molecule2, ..., molecule1000000, molecule10000001, ...). These experiments use very indirect means to pry out some information. Once we have that information, we'll know which molecules to look at more closely.

These studies of memory, in fact, are slowly coming to quite explicit conclusions. The point of this experiment was not just the fact discovered. Now that we *know* the connection of CaM-KII to memory, it's now sensible to use those routine methods for finding chemical structures, and from that deduce exactly how LTP (and hence perhaps cellular memory) works. We just work at filling in the blanks.

Suppose we had far more advanced technical abilities but still did not know how a particular life form works. (This may happen to us eventually). Could we really expect to decipher these new forms faster than we worked out our own structure and chemistry? Some might think it obvious that we could.

Against that claim, I would point out that we would still face the same kinds of problems we do now: experiments by their nature will take time. Even worse, they must build on the results of previous experiments and therefore can't be done in parallel. (I'm not talking of a simulation or a theory. I'm talking of getting your hands dirty in the world.) We will also face the same explosion of "possible worlds" that research faces now. True, we might eliminate possibilities by logic far more effectively than we can do now. But our increased perceptions may also slow us down, by letting us think of many more possibilities than can fragile blundering humans of the 20th Century. All to be checked out. All to be answered.

* * *

WITH LTP THE CELL WAKES UP

In trying to understand how memory on the cellular level takes place, neuroscientists discovered long term potentiation (LTP). A prolonged stimulus (but not a short one) to a neuron will make it easier to stimulate on the same path for a relatively long time following the event (hours, perhaps days, at least). This property would be exactly the property needed by a biochemical explanation of memory in our neurons. Hence many neuroscientists have studied LTP closely.

LTP doesn't simply involve changes in the chemicals already present at a synapse. It causes (by pathways we don't yet know) changes in the nucleus, causing it to make more biochemicals. Neuroscientists know this because they have detected the m-RNA carrying the design for these chemicals. This m-RNA becomes measurable only 30 minutes after the prolonged stimulus which causes LTP. Of course, to know this much only evokes more questions about the proteins for which these m-RNAs code and how they work together with other chemicals to produce memory.

A recent paper in *Nature* (340, 474 (1989)) by Paul F. Worley and others at the Johns Hopkins School of Medicine in Baltimore has carried this exploration a little further by finding, first, a more precise characterization of the chemicals synthesized, and second, a more precise idea of how appearance of these chemicals relates to other memory processes in time.

One early event in LTP is that special receptors in the cell membranes open to let in calcium ions. These receptors serve other purposes too. They are the receptors for NMDA (N-methyl-D-aspartate), another nerve transmission chemical, but they also respond to glutamate.

Arrival of appropriate nerve transmitter at an NMDA receptor will change its shape. Just like a small machine, that change can cause others in cascade, ultimately leading to LTP. What Worley and his coworkers have done is to show that one of these changes consists of appearance, within a few minutes, of m-RNAs for a variety of special proteins. On their sample of cells, the protein occurring most often is called zif/268. Significant numbers of cells also made c-fos, c-jun, and jun-B. At least in the cell type they studied (the dentate gyrus region of the brain) zif/268 predominated. Development of LTP, and existence of m-RNAs for zif/268, did not occur separately.

In understanding memory these proteins are quite significant for what they do. They

aren't structural proteins at all. They are part of the apparatus by which genes themselves are read off. The actual proteins (rather than their m-RNAs), once generated, would move to the cell chromosomes where they would affect, temporarily or permanently, just which genes were active in that cell. C-fos, for instance, is known to be involved in development. It plays a role in turning on (or off) switches in the cell that say what it will or won't make. C-fos occurs also in cancer, when changes in just what genes the cell uses become crucial.

In itself, just like other work on memory, this discovery means very little. But any observer can see how, slowly and carefully, an edifice is under construction. Its main lines come into visibility even though we can't easily say what details will come into view.

Understanding of memory at the cellular level seems quite imminent historically, even if we have to wait 10 years for it. Once cellular memory is built, we still won't understand global memory. Still, for cryonicists some simple experiments become possible.

Specifically, if we know the chemical mechanism of neuron memory, it should be possible to test for it in all the circumstances of deanimation. Almost certainly it will survive suspension. But there are other problems such as hypoxia or ischemia where biochemical tests may turn out quite significant, not to mention many traumas or disease states. For instance, much indirect evidence suggests that the memory of Alzheimer's patients is virtually intact, they just (just!) suffer from faults in input/output. Direct chemical tests for memory could prove or disprove this indirect conclusion. They could tell us the same about many other conditions which leave patients without memory.

Even if damage is found, the issue will then arise of what might be done to prevent it, either before or after deanimation. Unfortunately my sense of the subject suggests that we aren't quite at a level where such assays for memory could decide very much either way.

But finally all cryonicists should understand one grim issue. By having means to test for existence of memory and understanding its workings, we will certainly find cases of genuine erasure. And since humans are not always nice, we'll find ways to erase those memories against the will of their possessor. After all, it is only by having property that we can also have theft.

* * * * *

Meeting Schedules

Alcor business meetings are usually held on the first Sunday of the month. Guests are welcome. Unless otherwise noted, meetings start at 1 PM. For meeting directions, or if you get lost, call Alcor at (714) 736-1703 and page the technician on call.

The JANUARY meeting will be held at the home of:

(SUN, 7 JAN, 1990) Brenda Peters
8150 Rhea
Reseda, CA

The FEBRUARY meeting will be held at the home of:

(SUN, 4 FEB, 1990) Bill Seidel
10627 Youngworth
Culver City, CA

* * *

Alcor members in the San Francisco Bay area have formed an Alcor chapter, and are aggressively pursuing an improved rescue and suspension capability in that area. Meetings are generally held on the second Sunday of the month, at 4 PM. Meeting locations can be obtained by calling the chapter's Secretary-Treasurer, Thomas Donaldson, at (408) 732-4234 (home), or at work, (415) 593-3200 (ask for Thomas Donaldson).

The DECEMBER meeting will be held at the home of:

(SUN, 10 DEC, 1989) Roger Gregory and Naomi Reynolds
2040 Columbia St.
Palo Alto, CA

The JANUARY meeting will be held at the home of:

(SUN, 14 JAN, 1990) Keith Henson and Arel Lucas
1794 Cardel Way
San Jose, CA

The FEBRUARY meeting will be held at the home of:

(SUN, 11 FEB, 1990) Leonard Zubkoff
3078 Sulphur Spring Court
San Jose, CA

* * *

The New York Cryonics Discussion Group of Alcor meets on the the third Saturday of each month at 6:30 PM, at **72nd Street Studios**. The address is 131 West 72nd Street (New York), between Columbus and Broadway. Ask for the Alcor group. Subway stop: 72nd Street, on the 1, 2, or 3 trains.

The meeting dates are as follows:

DECEMBER 16 JANUARY 20 FEBRUARY 17 MARCH 17

If you live in the New York, Philadelphia, New Jersey, or Boston areas and would like to participate in the rebirth of New York cryonics please contact one or more of the following people:

Gerard Arthus (516) 474-2949
Curtis Henderson (516) 589-4256

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