Cryonics

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First Australian Suspended: The Cryonic Suspension of Roy Schiavello

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Please address all editorial correspondence to ALCOR, 12327 Doherty Street, Riverside, CA 92503 or phone (800) 367-2228 or (714) 736-1703. FAX #: (714) 736-6917.

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Editorial Matters

Mike Darwin with Hugh Hixon

The feature article in this month's *Cryonics* is the story of the cryonic suspension of Roy Schiavello, the first Australian placed into suspension. We have presented Roy's story in considerable detail for a number of reasons. Chief amongst them is to point out the difficulties and limitations of trying to give good cryonic care across great distances and national borders without meticulous prior preparation. Hopefully this account will motivate others who are remote from Alcor facilities to improve their level of readiness. At the very least, it should serve to point out what is realistically likely to happen if you deanimate far removed from Alcor's facilities.

But beyond the "negatives," there are also powerful positives in this story. Roy didn't get anything like the level of care he would have received had he been a signed-up member having his surgery in the U.S., or even in Australia with much advanced preparation. He did get far, far better care than he would have, had there been no local capability at all. In fact, it is quite possible that Roy would not even have been suspended were it not for the efforts of a fine, dedicated group of Alcor people in Australia.

Theo Tatton, Simon Carter, Michael Connaughton, Joe Allen, and Geoff Lee all contributed powerfully to "making it happen for Roy." And if Roy survives this ordeal it will be in no small measure due to their hard work and dedication.

On behalf of both Roy and the entire Schiavello family, we at Alcor Southern California extend our sincere thanks for a job well done.

Apologia

The August, 1990 issue of *Cryonics* contained a review written by John LaValley of *Are You A Transhuman* by FM-2030 (F.M. Esfandiary). This review contained some profanity and *ad hominen* criticism which was unprofessional. Several readers have called to complain about this review: specifically about the language used and the "lack of professionalism and depth" of Mr. LaValley's criticism. I was the editor responsible for approving Mr. LaValley's review and, as such, it was my responsibility to insure that it was edited in a way that meets the standard of professionalism and decorum that readers of *Cryonics* expect. My apologies for failing to exercise better judgment in this case. In an effort to accommodate many points of view and styles of expression I overstepped the bounds of good taste.—M.D.

Alcor Annual Reports Available

The fiscal 1988 Alcor Annual Report is now available. Copies of the Annual Report will be mailed to all Suspension Members and those in the sign-up process. Others wishing to obtain a copy of the report may do so by sending $3.00 (to defray costs of printing, handling, and mailing) to Alcor; Attention: Carlos Mondragon.

Membership Status

Alcor has 175 Suspension Members, 425 Associate Members, and 16 members in suspension.

Turkey Roast Time

Out here it's easy to lose track of time. Seasons aren't distinct as they are elsewhere in the country and one sunny day follows another. And while the rains haven't yet repainted the crisp-baked Southern California hills into a softer winter green, there can be no doubt that fall is here and winter can't be far behind.

That means that for those of us who work, we have to start planning for the holiday season and that means *Turkey Roast Time*. For new readers or members, the Alcor Turkey Roast is a potluck gathering stretching back many years, almost to the founding days of Alcor. It is an occasion where Alcor members and friends gather together to celebrate life, rejoice at our progress and victories and commiserate a bit on any losses or setbacks. It is an occasion of food, drink, merriment, and conversation. A chance for old acquaintances to see each other and for new acquaintances to be made.

We don't have any conferences or other special events scheduled for this year's Turkey Roast, but that doesn't mean it won't be fun. In fact, it's often better that way; plenty of opportunity for everyone to eat, play volleyball, and sit around the fire conversation pit after the sun goes down. As they have for the past three years, Alcor Members Saul Kent and Jo Ann Martin have opened their lovely home in the Woodcrest section of Riverside to us. Their home has a heated pool, jacuzzi, and large outdoor area, so come prepared with bathing suits and *dress casual*. If you are musically inclined and can play an instrument, there is a baby grand in the living room and usually one or two or three other musically inclined people to "jam" with.

There were, plus or minus, 100 people at last year's Turkey Roast and a wonderful time was had by all. This year promises to be even bigger. So, bring a swimsuit and towel, and *a covered dish* and we'll see you there. Oh, yes, I almost forgot, if you want to know what kind of food or drink to bring, please contact: Marce Johnson (714-962-7898) or Maureen Genteman (213-398-3464), who have graciously accepted the task of coordinating the pitch-in!

Alcor Membership Directory Now Available

Nearly a year ago, we mailed out postcards offering Alcor Associate and Suspension Members an opportunity to list their names, addresses, and phone numbers in a "Directory" which would be available to Alcor Suspension Members (and to those Associates who included their names in the Directory listing). For various reasons relating to computer problems too complicated to go into here in detail, this project was long delayed. Now, thanks to Manager of Information Systems (MIS) Director Joe Hovey, it's done. Copies of the Directory will be mailed out to Suspension Members and selected others with the Alcor 1988 Fiscal Annual Report.

We hope to have another edition of the Directory out by this winter. Also, let us know if the directory was a help to you in networking with other Alcor members.

Marcelon Johnson: Alcor Volunteer of The Month — All 12 of Them

Alcor Staff

One of the things we've been really lousy about is giving credit where credit is due to volunteers. Alcor couldn't run without 'em. In fact, we suspect that as much as 15% of what gets done in this operation gets done due to volunteers. And the volunteer among volunteers is Marce Johnson.

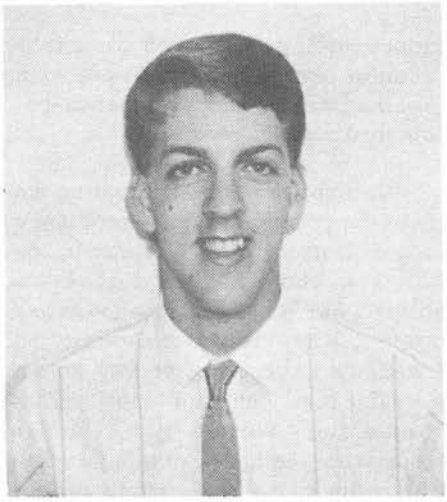
And it isn't just the hours that Marce puts in or her efficiency or reliability that makes her special. It's her eager willingness to take on tasks and her gentle good nature that have made her special to everyone in Alcor she comes into contact with. There is not a one of us who has had occasion to ask Marce to do something for Alcor who has ever known her to turn us down. She is *literally always there* when you need her. And she never complains when asked to do tasks that we would hesitate to ask any volunteer to do. Often she takes on chores that no one here would want to approach such as getting down on her hands and knees to clean the baseboard on the shower in the facility bathroom!

Marce comes out to Alcor several days a month and often several days a week, making the nearly hour-long drive from her home in Huntington Beach. She always shows up with a smile on her face, ready and willing to work, with a kind word for everyone. Her presence in the facility is often a balm; we've all seen her cause everyone to be a little nicer to each other and unwind a little on tense days, just because she was there, going about duties for which we (the staff) are *paid*, cheerfully, even joyfully with a kind word for all.

Marce, we just want to tell you how much we enjoy your presence here. We know we are gruff and often seemingly unappreciative bunch, but we do appreciate you, even if we don't always show it as we should.

If you, our Suspension Members, had any idea of the load that Marce carries, of her own choosing, in support of Alcor, I'm sure you'd feel as we do. Thank you Marce. Thank you!

New Alcor Staffer



To those who already wonder what we (all SIX of us) do around here all day long, there will be no explaining the addition of a SEVENTH full-time Alcor staffer. To those who *know* what's it like around here, the good news is that the new staffer's price tag is being paid virtually completely by directed donation. If there's a cryonics god, sending this fellow along was an answer to our prayers.

Who is this new person? His name is Ralph Whelan, and he showed up practically on our doorstep one day. We first heard from Ralph in May of this year when we received a letter from a soldier on duty in Germany (yes, now we can just say *Germany*) who heard of us as a result of media coverage in Germany of the Donaldson lawsuit. As is our custom, we sent off a free information pack to Germany (ouch!) and expected we might hear from the young Mr. Whelan someday when he was all grown up and seriously confronting the possibility of his own mortality (say when he was about 40 years old). Little did we know.

It turns out that Ralph was just a few months from getting his discharge, and he was anything but the usual camo-clad grunt. For openers, he was assigned to the U.S. Army's European Command band. And secondly, Ralph is just one bright, versatile cookie. Just what was needed at Alcor.

After he returned Stateside, Ralph made a few calls to Alcor and got underway signing up (a process he's now completed). In July he placed a call and spoke with Arthur McCombs offering the following proposal: "Would you be interested in having me work at Alcor on a volunteer basis for one month before I enter college, in exchange for gas money, the cost of meals, and a place to stay while I'm there?" With some trepidation and plenty of "cautions" and "cutouts", we decided to chance it. (Desperate men do desperate things, and after all, somebody had to take Steve Bridge's place!)

Ralph arrived on Saturday, July 28. And, aside from a day in the Emergency Room with food poisoning (fast food'll do it every time), he hasn't put in less than an average 10-12 hour day.

We're glad to have Ralph. He's versatile: he's an expert grammarian (notice the improvement in *Cryonics*) capable of installing splashboards on sinks, washing ambulances, doing medium duty car repair, creative writing. He's M-60, M-16, and 40mm grenade launcher qualified, well-versed in hand-to-hand combat, an accomplished musician (he played the sax for the Army band, and has a personal preference for New-Age jazz), and holding his own in arguments with Mike Darwin and Hugh Hixon. A real Renaissance man. And best of all, he's young. This latter is a refreshing and hopeful sign to the decidedly middle-aged Alcor staff, whose mean age is now about 42. It is refreshing (and, we admit, depressing) to have someone half your age around to share the load. As Alcor MIS Director Joe Hovey remarked, "Forget all the qualifications, the only thing that matters is that he's *young*."

We might also add that Ralph is *naive*, since he has decided to stay and work at Alcor, interrupting his education for a year, with plans to pick it up when he has California residency next Fall. Now, the only worry is how long Ralph will be working with us over the next month/year. Since he was just discharged from the Army, it is always possible he will be recalled to Saudi Arabia. This, we sincerely hope, WILL NOT happen. And if it does, Joe Hovey has generously volunteered to take Ralph's place. Now, if we can just convince the Army....

Welcome aboard, Ralph!

Tracking Volunteer Hours

Mike Darwin

About three years ago, in response to a very excellent suggestion from Alcor's founders Fred and Linda Chamberlain, Alcor Vice President Jerry Leaf made a valiant effort to implement a system to track volunteer hours and assign a point system to crediting them. The idea was that this would allow us to perhaps someday pay back those who have been diligent and generous with their time and energy. Such payback might even include holding the line on suspension cost increases for those who've "earned credit" by volunteering.

This system didn't work, solely because the volunteers simply refused to track their hours. Now, we have a Coordinator for Volunteer services in the person of Joe Hovey, who also happens to be the Manager of Information Services man around here; the guy who rides herd over the computers and the ebb and flow of information they contain. Joe has agreed to begin tracking and crediting volunteer hours. This is necessary not just because we want to pay back those who've helped us or keep track of who's been especially nice to us, but also because we need to know exactly what fraction of our operation relies on volunteerism and factor that information into our planning and cost assessments.

Hopefully within six months to a year we'll be able to assess in what areas and to what degree volunteerism is keeping Alcor afloat. This will help us to plan our future more intelligently and focus our efforts on boosting volunteerism in areas where it might be working better.

New Books on Nanotechnology and Cryonics

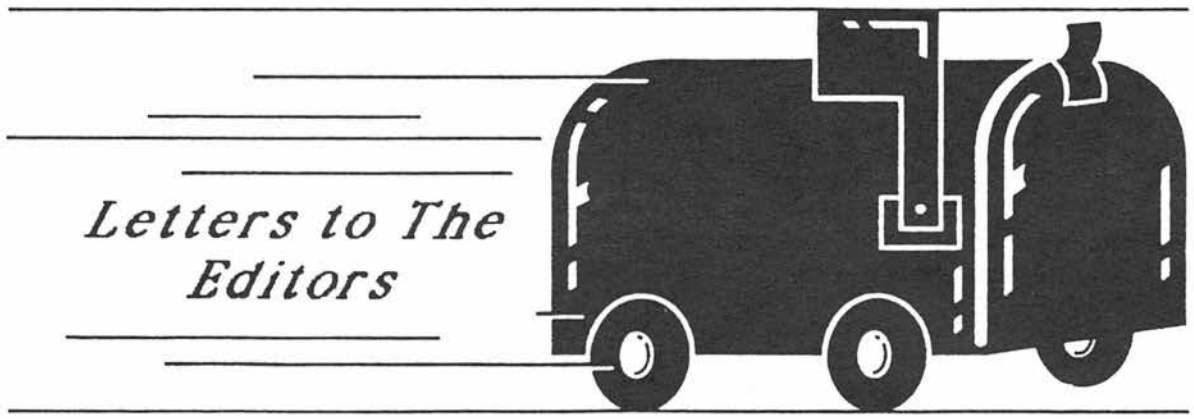
Mike Darwin

We understand that noted science fiction writer Greg Bear has written two books which relate to cryonics and nanotechnology. The first, *Angel's Flight*, reportedly deals with the impact of nanotechnology on 21st Century human civilization. It is available in the U.S. now in hardcover and we expect to have a review of it in these pages sometime in the next month or two.

The second novel, *Heads*, which treats cryonics, will be available in the United Kingdom in September of this year from Century-Legend for £8.95. *Heads* reportedly is set in the 22nd Century and deals with the exploits of powerful "founding family" of lunar colonists, one member of whom purchases a "job lot" of frozen heads from an earth-based "preservation society" that has gone bankrupt. We have no details on when or even if this novel will be available in the U.S., but we are attempting to secure a review copy from the U.K. publisher (such copies are already circulating). If and when we get a copy, we'll review it here for you.

Those of our readers who have read Bear's *Blood Music* will understand that Bear should have a tremendous grasp of both the science and the social/political issues involved. *Blood Music* is a chilling, gripping, and all too believable vision of nanotechnology gone awry — written before Drexler's book was published and the word nanotechnology had even come into common use. We await *Heads* with genuine interest and, if not anticipation, then eager trepidation.

With not so eager anticipation we are in the process of trying to obtain a copy of (former L.A. "Coroner to the Stars") Dr. Thomas T. Noguchi's latest novel *Physical Evidence* (Warner Books). Reportedly it deals with cryonics in a very negative way, with a story line revolving around the murder of an elderly woman by a cryonics group who "cut her head off and froze it in order to get their hands on her money". Hmmm... we wonder where he got that idea from....



Dear Editors,

It's great to hear your new patient storage dewar, "Bigfoot," is performing so well. However your annual storage cost calculations raise some important questions.

One of the main reasons I chose Alcor as my cryonics organization was because of your use of Cephalarium Vaults to store neurosuspension patients. (For new readers, Cephalarium Vaults are fire-resistant, earth quake-resistant, reinforced concrete vaults which protect neuropatient storage dewars). Indeed, your use of these vaults was instrumental in my decision to select neurosuspension as well. I have always assumed my neurosuspension arrangements implied storage in these vaults or some analogous "super protected" structure.

The "Bigfoot Revisited" article in the July, 1990 issue of *Cryonics* seems to suggest you are considering using unprotected Bigfoots for neuro storage once your remaining Cephalarium Vault becomes full. This is a very serious matter. I hope you can clarify it, perhaps by answering a few questions.

1) Do you have any plans for installing vault protection for either whole body patients or Bigfoot neuropatients? If so, why are these costs not included in dewar amortization in the July article?

2) At present funding minimums, are not neuropatients overfunded compared to whole body patients? If so, how does this overfunding translate to improved security for neuropatients, or does it? (I had always assumed vault protection was the added security available to neuropatients because of their overfunding.)

3) If neuropatients are not more secure than whole body patients, are not whole body patients being unfairly subsidized by neuropatients?

Thank you for your attention.

Yours truly,
Brian Wowk
Winnipeg, Canada

Carlos Mondragón comments:

Brian's questions are quite relevant. The answers are as follows: No, we don't have any plans to put vault protection around the Bigfoot dewars. We have room for eight more neuropatients in the two vaults we have now. In two to three years we plan to be in a new facility; once we're there, the existing vaults will be decommissioned. Since the plans call for a patient storage area that will be, in effect, a 700 square foot vault, all the patients will be "super-protected." The long-lived myth that neuro patients are overfunded compared to whole body patients, and that the former are thus subsidizing the latter, was finally put to rest in the "Cost of Cryonics" article (published after Brian wrote his letter).

Mike Darwin comments:

I think the issue of "de-commissioning" vaults for neuropatients will be one that requires a great deal of discussion — even after we are moved into a more secure facility. The fact is that these vaults exist and have been paid for, and, even if all patients are stored in a hardened structure, it is hard to argue against further hardening, particularly when the capital expenditure has already been made. Any decision to abandon vault protection will, I feel sure, be made only after careful consideration of all the factors involved, and then only after the new patient care building is up, running and determined to be adequate to confront any seismic or other dangers with a high degree of confidence.

To Mike Darwin and Carlos Mondragón:

Thank you, Mike, for your excellent discussion ["The Cost Of Cryonics," *Cryonics*, **11(8)**, 15 (August, 1990)]. I was impressed with both the depth and breadth of the discussion.

However, as I discussed with you on the phone, I want to point out some factors relating to your discussion of interest income.

On page 19, you mention the natural rate of interest.

It can be argued that the real return of money, which you put at 2-3%, represents a charge on the members that is not needed. The difference between the final $338,017 and the initial deposit of $83,464 represents additional profits above what is needed to cover the effects of inflation. Do you really need to have the additional safety factor after you have already added a multiple of expected costs?

For example, let's round up the cost of yearly storage to $2,000 per year. You can currently receive over 7% in interest from a bank. This means that you need only about $29,000 to generate that income, not $83,000.

This $29,000 will continue to pay for yearly storage costs *ad infinitum* as long as inflation does not rise above the nominal interest rate for any sustained period.

I agree that Alcor should have some safety margin, but does it need to be almost three times? Are you pricing suspensions too high?

On the other hand, maybe you are pricing suspensions too low. The classic long term study of returns of various instruments is by Ibbotson & Sinquefield. It shows that the real returns (returns after inflation) for treasury bills was zero and for treasury bonds was about 3% (I believe this is the source for the idea of the natural rate of money that you refer to).

Thus, your assumption of 2-3% real returns is based on the assumption that the Patient Care Fund (PCF) is invested in long term treasury bonds rather than short term 90 day treasury bills.

But I believe that Alcor invests the PCF mainly in short term instruments (CD's, for example) which have, over the long run, no real yield.

I offer these comments to help you make your long term strategic decisions.

Let me further suggest that you put together a list of your liabilities and assets and make sure that the lifespans of the two categories match. This is how life insurance companies operate. The life insurance company expects you to die in thirty years and they will have to pay $100,000. This is a liability. They then look for an asset that will pay *at least* $100,000 in thirty years. They therefore "lock in" a profit.

If you have any questions or if I can be of further help, don't hesitate to call.

Best wishes,
Courtney Smith
New York, NY

Carlos Mondragón comments:

Courtney Smith's letter at first suggests that the logic which Alcor uses to calculate safety margins might result in too high a cost for suspension. We assume that the the true cost of money (the interest paid by a free market on the lowest risk investment in a zero inflation environment) is between 2% and 3%. In our economy, the lowest risk interest-paying investment is a Treasury Bill. T-Bills are the short term borrowings of the Federal Government which finance its day-to-day spending. Interest on 90-day T-Bills has been running at about 6.5%; this tells us that the market is putting inflation at about 4% (close to the official figure). With annual costs currently being $854.38, we need $42,719 in capital just to keep up with inflation. We double that figure in order to provide some margin in our ability to deal with contingencies. The $338K which Courtney identifies as "profits above what is needed to cover . . . inflation" is the result of compounding interest on the safety margin, assuming that neither the capital or its income ever have to be used. That assumption is too much even for the most ardently optimistic among us (even me).

The argument that $29,000 at 7% interest will generate $2K annually ad infinitum, ignores the fact that as long as we have inflation, that $2K will be worth less every year. Unless one reinvests that portion of interest income that is equal to the inflation rate, the underlying capital base and its future income will be diminished.

Given that a single legal challenge to a member's suspension could easily cost us $75K (our bills on the Dora Kent matter), I don't think that an extra $43K in capital ($7.5K for neuros) is out of line as a safety margin.

I would agree that we may be pricing suspensions too low, but not for the reasons Courtney suggests. The Ibbotson study he refers to takes into account the diminution of capital due to inflation plus the accumulated interest returned without any reinvestment of income. Actually we can and do get more that a 2% real rate of return by putting portions of our funds into negligible risk instruments, e.g.: short term insured CD's yielding 9%. My reason for thinking that funding minimums might be too low is that so far, the only recognition of organizational overhead which we have allowed is the 20% "mark-up" which Mike added to most of the suspension supplies costs in his article.

The costs of "keeping our doors open" and thus keeping our patients suspended are much higher than that. The allocation of these costs between dues-paying members and suspension patients is currently a running topic of debate.

The Case For Neurosuspension

Brian Wowk

This article is intended both as a general essay on the merits of neurosuspension and as a rebuttal to various points raised in Michael B. O'Neal's article, "The Case for Whole Body Suspension" (*Cryonics*, July, 1990).

Neurosuspension, quite simply, is low temperature preservation of the brain of a terminal patient. All efforts in neurosuspension are devoted to the singular purpose of preserving the brain, and only the brain, in the best possible condition allowed by present technology. The disposition of other tissue only matters inasmuch as it impacts upon the condition of the brain.

Now, it just happens that the least damaging way to preserve a brain is to leave it enclosed within its protective cranium. In other words, the best way to preserve a person's brain is to preserve their whole head. Unfortunately it is at this point that most people don't want to hear any more about neurosuspension.

Medicine is not always pretty. There are surgical procedures within conventional medicine that make neurosuspension aesthetically tame by comparison. Patients and their families consent to such procedures because they know that they offer the best chance for a return to wholeness and health.

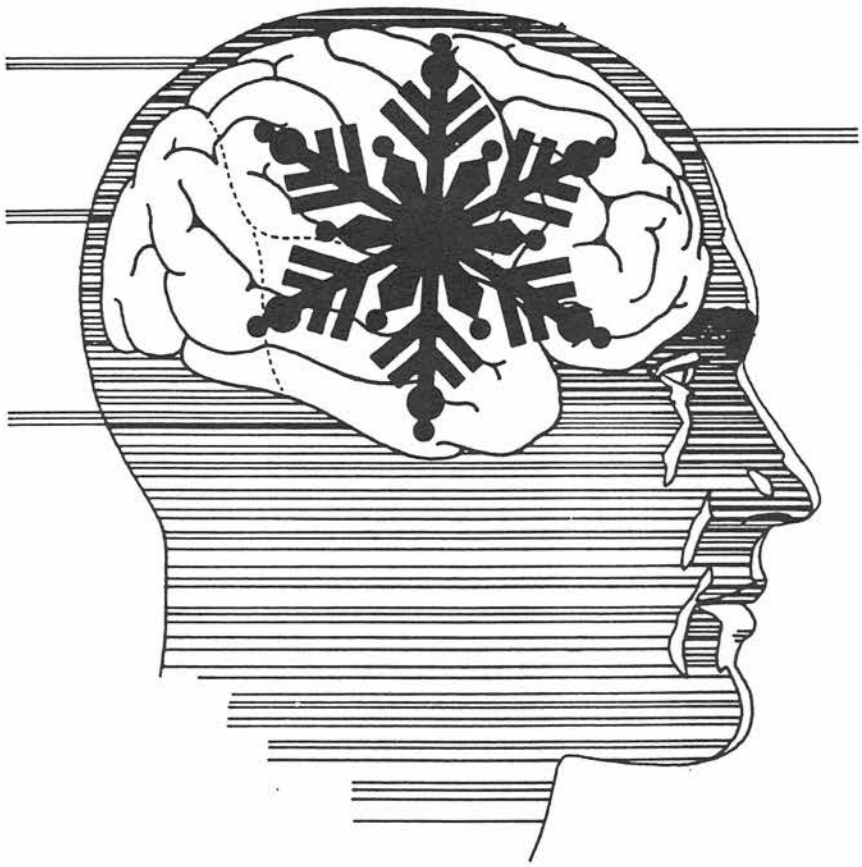
Similarly, the goal of neurosuspension is to offer a terminal patient the best possible chance for a return to wholeness and health. Isolation of the brain (with the head) is merely one phase of a process which must be viewed in its entirety. Like conventional surgery, this process is to end with the patient returned to wholeness. Alcor member Charles Hartman has in fact long described cryonics as the "long operation."

Will it be more difficult to restore neurosuspension patients to health than whole body patients? I think not. In fact the reverse may be true.

It is important to realize that growth of whole bodies from scratch is an established "technology." It has existed in nature for hundreds of millions of years. It is how we all got to be here. The enormously complex program for growing whole human bodies from a single cell is already written in our genes. Future medical regrowth of bodies will involve modifying this program to allow for insertion of genetic information from somatic cells and suppression of brain regrowth to allow implantation of an original brain.

Both whole body and neuro patients will require molecular repair of the brain. However, whole body patients will also require molecular repair of every other organ and tissue of the body. These repairs will involve reversing aging and severe freezing damage. Such repair processes do not exist in nature, and will have to be custom-designed for tissues spanning a vast range of histology and function. It seems much easier to simply grow a new young body using natural processes (in-vitro, of course) rather than designing a host of radical new repairs from the ground up.

In his article, Michael B. O'Neal expresses concern that a new body might not feel the same as the old one. Yet surely this is a problem common to both neuro and whole body patients alike: having a diseased, aged body replaced in a subjective instant by a



young healthy body (either repaired or replaced) is definitely going to feel strange. This is something all cryonics patients will have to deal with.

What about the difficulties of "interfacing" a new body with a patient's brain? These could not be anything so crude as immunological incompatibility (a trivial issue from the standpoint of nanotechnology). A more likely problem could be joining the axons of the brain stem to the right muscles of the body. These connections might not be completely genetically determined. Various motor skills, such as walking or playing the piano, might have to be relearned. I think that would be the worst possible case.

Is whole body suspension, then, a more prudent, conservative stance? Not necessarily. The future cannot help us if we do not get there. Dollar for dollar, a neuropatient is ten times as secure as a whole body patient. This is a basic consequence of volume ratios: a neuropatient requires one tenth the liquid nitrogen and one tenth the storage space, of a whole body patient. Even if a person can afford whole body suspension, the same funding level will carry them much further as a neuropatient. Everyone should remember that Alcor's emergency conversion to neurosuspension takes effect only after severe depletion of funding.

Of course, whether a neuro patient is literally ten times safer than a whole body patient with the same funding level depends on the operating policies of the cryonics organization. However, if a cryonics organization does not translate better funding vs. maintenance cost ratios into better security, serious questions should be asked of that organization. Such a situation would imply unfair subsidization of some members by other members.

To summarize: Neurosuspension offers a tenfold increase in suspension security without apparent compromise of revival chances. I believe this logic underlies the decision of most Alcor members, including myself, who have chosen neurosuspension.

The Cryonic Suspension of Roy Schiavello

Part I: Alcor Southern California Perspective

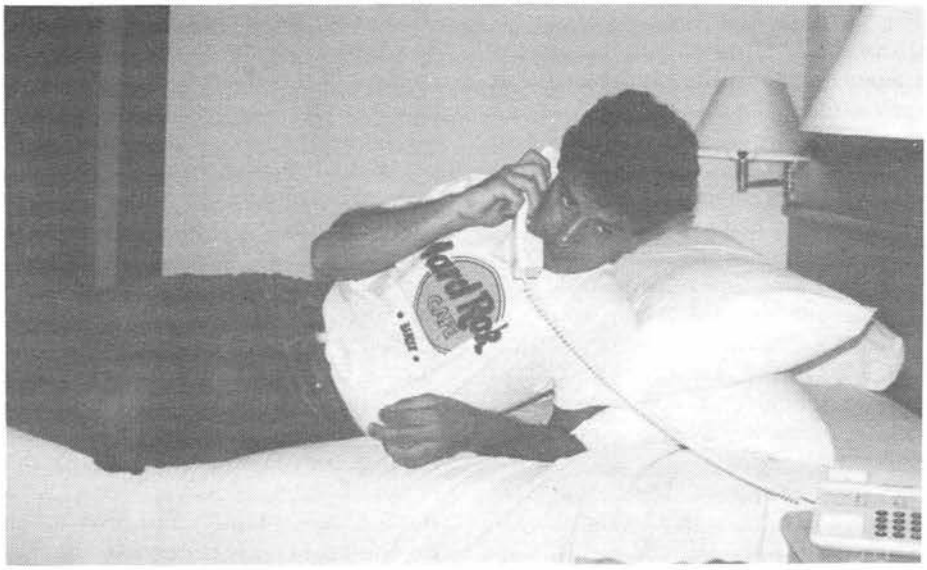
Mike Darwin

At approximately 2115 Pacific Daylight Time (PST) on the evening of June 22, 1990 my beeper went off as I was sitting in a restaurant in Fullerton, California. It was a familiar setting, The Old Spaghetti Factory, a place the Alcor staff regularly frequented when we were quartered in Fullerton a few years ago. Within a few minutes I was in touch with Hugh Hixon, who was manning the phone at Alcor in Riverside. The situation was a not uncommon one these days: someone was calling to request suspension for a relative who had just deanimated. These calls are now fairly frequent and almost never work out. *Almost.*

This case seemed especially bleak since the call was coming from Australia. Nevertheless, Alcor has a rigid policy of returning all such calls and gathering all the information before making any decision to proceed or not. I immediately returned the call made a few minutes before by a woman named Mrs. Frances Costa, reportedly on behalf of her brother who had, according to Hugh, "just experienced cardiac arrest as a result of neurosurgery of some kind."

I reached Mrs. Costa almost immediately and asked her for details of the situation. The story was both straightforward and heartbreaking. Mrs. Costa's brother, Rocco ("Roy") Schiavello, a 30-year-old computer programmer, teacher, and amateur astronomer, had been operated on for a deep-seated oligodendrocytoma on 20 June. He had developed cerebral edema (brain swelling) during surgery, and experienced cardiac arrest approximately 48 hours afterward without ever regaining consciousness. Prior to his operation, Roy had secured a promise from his family that if he did not survive the operation, he should be placed into cryonic suspension. According to Mrs. Costa, Roy had often talked about cryonics and had always said he wanted to be frozen, whenever discussions about death or methods of disposition came up in conversation.

After gathering the relevant details I did my best to inform Mrs. Costa of the problems. This process took a considerable amount of time and consisted of my best efforts to dissuade the family from pursuing cryonic suspension for Roy. I pointed out that first and foremost they were under no moral obligation to do this, and that the responsibility for making



Roy Schiavello a few months before surgery in 1990.

suspension arrangements lies only with the individual. More to the point, I described in great detail the adverse legal, financial, and above all *biological* situation they were confronting. They were days away from being able to move Roy to the United States, where an attempt to introduce cryoprotectants under ideal conditions could be carried out. Furthermore, many hours had elapsed since Roy experienced cardiac arrest and during much of that time he would have been air-cooling only very slowly in a refrigerated morgue.

Additionally, there was the problem of the primary cause of legal death: brain swelling with accompanying likely compromise of blood flow to large areas of the cerebral cortex many hours before heartbeat and breathing ceased. This alone was a major barrier to any hope of recovery. I did my best to paint the grimmest picture possible of Roy's likely biological condition. I also explained the financial and legal caveats, including Alcor's need for control over Roy's suspension and our *Emergency Conversion to Neurosuspension* clause in the *Cryonic Suspension Agreement*. Nothing I said or did affected their resolve to pursue suspension. I was told "This is what Roy wanted, what he would have wanted regardless of the odds, and this is what we are going to give him. If you can't help us, please refer us to others who can, or at least tell us how to freeze him down ourselves until we can set up things locally to take of him."

I did refer them to the American Cryonics Society/Trans Time (ACS/TT), the only other cryonics organization that accepts non-members for suspension (and they indicated that they already had a lead on ACS/TT themselves from local media). I also urged them to contact ACS/TT to get information on their program and find out what they had to offer.

After some additional conversation I told Mrs. Costa that I would take their request to the Alcor Board of Directors, and that it was now critical that I leave the restaurant and drive back to Riverside (30 minutes away) to begin putting the wheels in motion to poll the Alcor Board.

As it happened, the Schiavellos couldn't have been in a better place in Australia. They were located in Melbourne, a city of almost three million, where there just happens to be not only a large concentration of cryonicists, but also a sympathetic, supportive, and very competent mortuary firm, *Mulqueen's Proprietary Limited*, and an embalmer who also fits the same the description, by the name of Peter Irvine. Before I rang off to Mrs. Costa, I told her to contact Terry Mulqueen and arrange to have Roy picked up from the hospital refrigerator and packed in water ice for more rapid and deeper cooling.

I arrived back at Alcor about 45 minutes after ending my call to Mrs. Costa. Hugh had already begun locating Board members and Carlos Mondragón, Alcor's president, had been summoned from home for a briefing. Upon arrival at the facility I faced a decidedly skeptical "core crew" of Carlos and Hugh Hixon. A suspension in Australia seemed pretty far-fetched. After all, we'd had no prior contact with these people and it seemed likely that there could be trouble. What were the odds that they *really* understood what they were getting into?

I told Carlos and Hugh that I was impressed with Mrs. Costa's levelness, emotional balance and above all her *fierce commitment to carry out her brother's wishes regardless of how she felt about them personally*. I told them that what actually impressed me most about this situation was Roy's strong and repeatedly expressed desire for suspension and, perhaps paradoxically, Mrs. Costa's own statements that she did not think cryonics would work, but rather was doing this to honor her brother's wishes, something which she felt deeply duty-bound to do. Also, the Schiavellos seemed to meet all of the objective criteria Alcor had set in its "Guidelines For Accepting Non-Member Suspensions" (see *Cryonics*, **11(4)**, 6-13 (April, 1990).

Carlos and Hugh still appeared very skeptical at this point and I urged them to resolve this skepticism by talking with Mrs. Costa directly. I felt certain that her determination and her professionalism (yes, *professionalism*) in such a time of crisis would work its magic on them too. I also put in motion a call to Theo Tatton, the principle activist in the Melbourne area, with the object of getting him over to meet with the Schiavello family and provide an on-the-scene assessment as soon as possible—as well as provide the Schiavellos with printed material on both Alcor and ACS.

Carlos called and spoke with Mrs. Costa, carefully going over the same ground I had with reference to the biology, and then adding in a new set of disclaimers and negatives regarding legal and financial matters (his special area of expertise). Mrs. Costa held firm and answered all of Carlos' questions in ways that were satisfactory. A particular area of concern was the position and authority of *other* family members (since there were a total of six brothers and sisters and Roy's mother, Rosa Schiavello, to consider). Once it was established that Roy's family supported his suspension completely (an unprecedented situation in and of itself) and that the costs of the suspension would be ultimately be borne by Roy's estate (but initially by family members), a decision was made to brief the Alcor Board and take a vote.

The Board was polled in the early morning hours of the 23rd and the vote was a unanimous "Go." A call was then placed to Mrs. Costa, informing her of the Board's decision. Mrs. Costa informed us that the mortician, Terry Mulqueen, was already *en route* to pick up Roy and begin packing him in ice.

Meanwhile, more good news had arrived as a result of my call to Theo Tatton being returned: due to a lucky coincidence, the Cryonics Association of Australia was having an informal meeting that weekend and Simon Carter, CAA president, was in town as well as CAA members Michael Connaughton and Joseph Allen (the latter a long-time Alcor Suspension Member and recent immigrant to Australia who now lives in Melbourne).

Within a short period of time we were in touch with Terry Mulqueen and a decision was made to try to carry out cryoprotective perfusion prior to cooling to -79C (-110F). This decision was a difficult one and was made for a number of reasons. First of all, there was the legal requirement that some sort of disinfection of the body take place and after some consultation it was determined that systemic treatment with a broad spectrum antibiotic would suffice. Another factor was that Roy would need additional time to cool to near 0C (32F) on water ice and dry ice would be unavailable until Monday morning, some 36 hours away! There seemed little reason not to

try and get some cryoprotectant in place before proceeding to -79C.

CAA member Geoff Lee in Canberra was contacted through Thomas Donaldson and asked to do an inventory of the limited supplies that the group had stockpiled there. Geoff confirmed that the Australian group had a limited supply of transport medications, including antibiotics, moderate quantities of an IV electrolyte solution known as Normosol-R, I.V. mannitol solution, and approximately 12 liters of glycerol. Normosol-R has an electrolyte make-up and pH approximating human plasma and the mannitol and glycerol could be used, in conjunction with other locally available supplies, to prepare a reasonably physiological cryoprotective perfusate.

Geoff agreed to make the 8-hour drive with supplies to Melbourne after grabbing a few hours sleep in the morning. The next action item was to call Alan Sinclair of Alcor U.K. in England and arrange to have him ship the U.K. group's insulated dry-ice air shipping container to Melbourne. After rousing Alan out of bed, he affably agreed to ship the box as soon as possible.

Then, frantically, over a period of about six hours from about 2300 till 0530 PDT, a perfusion protocol was drafted and faxed to Terry Mulqueen for embalmer Peter Irvine to use on Roy. Peter had worked with Alcor in the past; he was the mortician who had perfused Australian Alcor member Michael Connaughton's dog (see *Cryonics* **11(3)**, 28-33 (March, 1990) in April of 1989.

* * *

MEMO

June 24, 1990

From: Mike Darwin
To: Terry Mulqueen
Re: Perfusion and freezing protocol for Roy Schiavello

The following protocol should be used to prepare Mr. Schiavello for transport to the United States.

Materials And Methods:

Normal embalming solutions should not be used since they contain particulates and undesirable compounds (dyes, emulsified compounds, etc.) which will cause unnecessary injury.

Preparation of The Equipment

The embalming pump should be thoroughly cleaned by washing with a mild household kitchen or "dish type" soap (the kind used to wash up after meals). After the pump reservoir and system have been thoroughly scrubbed and cleaned up, the machine should be flushed *thoroughly* with copious amounts of clean tap water until there is no trace of soap in the reservoir or the output from the unit.

The machine should then be flushed *twice* with a minimum of two gallons of distilled water (obtainable from a food market) by running the machine until the reservoir empties. Attach the Tygon tubing at the start of the cleaning procedure. It is probably also wise to attach the cannula to the machine during cleaning as well. Everything should be brought to as high a level of cleanliness as possible.

Immediately before the machine is loaded with the perfusate to be pumped through the patient it should be rinsed with at least 2 liters of the Normosol-R that will carry the glycerol.

Before a cannula is placed into the patient's vessels, the cannula and connecting lines must be *thoroughly and completely* purged of air. This is best done by running solution through the cannula and back into the machine's reservoir for a minute or two before inserting it into the patient's carotid. The machine and lines should be vigorously tapped during this time to dislodge any air bubbles.

The line carrying perfusate to the patient should be packed in ice.

Preparation Of Perfusate

Three concentrations or "strengths" of cryoprotective solution should be prepared and flushed through the patient's "head" circulation.

These solutions should ideally be made up of the following ingredients and in the following amounts:

To each of the following batches add:

1 ampoule Isoptin
1,000 IU heparin per liter
40 mg Solu Medrol

Note: glycerol is the same as glycerin.

Initial Flush:

600 ml glycerol (Australian Pharmacopia Grade)
500 ml 0.3 Molar THAM
500 ml 20% Mannitol
6,400 ml Normosol-R made by Abbott Labs (acceptable alternatives are Plasmalyte made by Travenol Labs or any other intravenous electrolyte fluid replacement solution. The least desirable alternative would be Ringer's Solution).

8,000 ml total volume

Glycerol Concentration: 7.5%
mOsm of base perfusate: 323

Second Flush:

1,800 ml glycerol (Australian Pharmacopia Grade)
500 ml 0.3 Molar THAM
500 ml 20% mannitol
5,200 ml Normosol-R made by Abbott Labs

8,000 ml total volume

Glycerol Concentration: 22.5%
mOsm of base perfusate: 279

Final Flush:

2,400 ml glycerol (Australian Pharmacopia Grade)
400 ml 0.3 Molar THAM
500 ml 20% mannitol
4,700 ml Normosol-R made by Abbott Labs 500 mg Erythromycin

8,000 ml total volume

Glycerol Concentration: 30%
mOsm of base perfusate: 260

When you are down to the last liter of the final flush perfusate you should add 100 cc of Hypaque-76 to the reservoir. Hypaque is the brand name for an iodine-containing radiopa-

que dye. Its function is to allow us to CT scan the patient when he arrives so we can determine how well, if at all, his brain perfused. The chemical name for what we want is: 66% diatrizoate meglumine and 10% diatrizoate sodium, injection. Any product with roughly this concentration of diatrizoate will do. Hypaque is a product of Winthrop Labs.

All of the above should be perfused through the head via the carotids. The body should be perfused with the following:

First Flush:

2,900 ml glycerol (Australian Pharmacopia Grade)
500 ml 20% mannitol
8,900 ml Normosol-R made by Abbott Labs

12,300 ml total volume

Final Flush:

2,400 ml glycerol (Australian Pharmacopia Grade)
5600 ml Normosol-R made by Abbott Labs

8,000 ml total volume

If you run short on solution, by all means preferentially treat the head.

If you don't have a graduated cylinder for measuring volumes, you can use the bottles that the IV fluid came in, as they are usually graduated. You can pour the mixed up solution back into the 1 liter bottles to facilitate fast chilling by packing them in ice.

All of these solutions should mixed up in clean plastic reservoirs (clean 5 gallon pails or jerrycans can used) and chilled on ice or in your refrigerator for at least several hours. A good source of 20 liter mixing reservoirs is a restaurant supply house or a hardware store that sells 5 gallon pails for mixing paint, etc. Perfusate should be no warmer than 10C. **Do not warm the patient up radically by perfusing him with warm solution!**

Perfusion (Injection) Technique

Perfusion should be done using open circuit technique: i.e., alternate perfusion via the carotid arteries and open drainage via *both* internal jugular veins. It will be necessary to clamp off the "opposing" carotid during alternating perfusion.

The scalp incision from the prior neurosurgery should be carefully opened and the bone flap, if present, should be removed. Any clots obscuring the cortical surface should be gently lifted away. The brain should be carefully observed for signs of blood washout. Close the skin flap (*leave out the bone flap*) following perfusion using interrupted suture technique. Place the patient's head in a small plastic bag and tape the bag snugly to the neck so that brine solution doesn't get in to the brain during subsequent ice/salt cooling. Also, be sure to protect the brain incision from direct contact with dry ice.

Flow rates should be low: no more than 200 cc/min to the head and no more than 600 cc/min to the body. Pressure should not be over 80 mmHg, this is about 1.5 pounds per square inch. You will probably need to set your pump to just about the lowest pressure possible. Don't be in a hurry. Let the solution flow through the patient slowly. Venous drainage will be modest at first, but will pick up up with time (the reverse of the normal situation). If it is necessary to "open up" the circulation, the pressure can be increased to 2-3 psi temporarily.

If you see serious edema (swelling) developing with poor venous return, you may switch to a higher concentration of glycerol solution. If the brain begins to bulge out of the incision, perfusion *must be stopped.*

Cooling With Ice and Salt

Ice and salt can be used to start cooling down. Be sure the patient is protected from contact with the resulting "brine melt" by wrapping him in a plastic tarp. Be sure to keep the patient covered in ice and salt at all times (it will take a *lot* of ice and salt). Try to seal up the head wound, or place the head in a plastic bag taped snugly around the neck to provide extra protection from brine getting into the brain. The patient should be held in the ice/salt mixture for no more than 4 hours.

Cooling To Dry Ice Temperature

After 4 hours, remove the patient from the ice/salt mixture and, leaving him wrapped in the plastic tarp, wrap him in a single layer of a bed blanket (a polyester bed blanket) place it in the cooling chest atop a bed blanket or two which is in turn overlaid on a bed of crushed dry ice (2" thick). Completely cover the patient in crushed dry ice.

Keep the patient completely covered with dry ice at all times until he can be shipped to the U.S. *Every exposed part will be about 30C warmer than areas covered with dry ice!*

Monitoring and Record Keeping

Collect as much information as you can. Monitor pharyngeal temperature and perfusate temperature at 10 minute intervals during perfusion. Record perfusion pressures and flow rates (i.e., rate of reservoir level drop vs. time) at 10 minute intervals or whenever a change is made. Note amount of venous drainage: it may be collected in empty glass IV bottles by holding them to the margin of the wound after the initial clotted material has been displaced. Collect venous effluent samples, 10 cc quantity x 2 at 10 minute intervals during perfusion. It is very important to get samples of the "first blood" out of both the head and body so we can do analysis later. Be sure to freeze these samples in 20 cc containers *on their sides* so that the bottles do not burst from ice expansion.

Take notes about everything you see and every significant event that happens. In particular, note the amount of time that the patient is not packed in ice during transfers and so on.

If you've got a camera: GET PICTURES EVERY STEP OF THE WAY. A picture is worth a thousand words and will help us to understand what really happened.

Part II: The Australian Perspective

Simon Carter, President of the Cryonics Association of Australia, Inc.

Note: All times given in Part II are Melbourne time, 17 hours ahead of Pacific Daylight Time (PDT)

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Just after 6:00 PM on Friday, 22 June I boarded an interstate coach in Sydney for the overnight journey to Melbourne. The two cities are roughly 550 miles apart, and whilst I usually visit Melbourne once or twice a year, this was to be my first time there for two and a half years. Melbourne is a pleasant city with old-style grandeur and all the attractions of a major cosmopolitan center of nearly three million people. A major reason for my visit was to meet with local cryonicists, whom I rarely see in person, and a mortician sympathetic to cryonics.

About the time my coach departed, Roy Schiavello, a 30-year-old computer programmer, was declared legally dead after having developed brain swelling (cerebral edema) following an operation that was intended to remove a large tumor from the fluid-filled cavities (cerebral ventricles) in the center of his brain. Whilst Roy had never made contact with the Cryonics Association of Australia (CAA) or Alcor he was very much aware of the idea of cryonics and wanted to be suspended should the need arise. He had the tremendous advantage of having had the necessary funds and a family determined to carry out his wish.

Roy had been diagnosed in August of 1989, 10 months before progression in symptoms (short-term memory deficits, headaches, and "blackouts") caused him to undergo the operation, but had withheld this information from his family until a short time before deciding on surgery. Both Roy and his family were informed by the neurosurgeon that the operation had an excellent chance of success and that his risk of mortality was no greater than 3% to 5%. When Roy did not recover and in fact deanimated, his family were stunned. Nevertheless, they embarked on a worldwide search to find a cryonics organization willing and able to suspend Roy. They spent over eight hours on the telephone, finally succeeding in tracking down Alcor via a Melbourne television station.

Unaware of all this I was enjoying my first day in Melbourne. As planned, I met Theo Tatton in the early afternoon in the center of town and spent a good hour discussing the forthcoming Annual General Meeting (AGM) of CAA. We were concerned both with improving Australian suspension capabilities before an emergency hit us and with how to raise the money required. As things stood, our cryonics capability was woeful, having declined over several years of inactivity to a level little better than that of the early "embalming pump" days of cryonics.

Awaiting us when we arrived at Theo's home in the late afternoon were several telephone messages. One was from Alcor and Theo called whilst I, assuming it would be a private affair concerning his nearly finalized suspension paperwork, went into the lounge to talk with one of his sons about submarines. I am employed as a civilian software engineer supporting the Australian submarine fleet and that often provides an interesting starting point for conversations. All of a sudden I heard "Good heavens, when did he die?" coming from a clearly agitated Theo. End of submarine conversation.

I joined Theo by the phone and we were given a quick synopsis of the situation, although details were sketchy. Mike Darwin wanted us to visit the relatives, assess their degree of commitment and understanding, and answer any questions they had, as well as provide the human face of an otherwise remote cryonics organization in California.

About an hour later, after gathering up some material Theo had available on Alcor and cryonics, (the "Bluebook" and back issues of *Cryonics*) Theo and I set off to visit the family. Upon arrival we walked into the tail end of an extended wake. I simply didn't know what to expect as we were ushered in to meet five of Roy's siblings and a close friend. I was anxious to express that we were *not* coming as salesmen and that the two of us, having made suspension arrangements with Alcor, were present as friends offering help. My overall impression of the family was that whilst not all of them fully comprehended (or even agreed with) cryonics they were united in a desire to carry out their brother's wish. This impressed me.

I contacted Mike Darwin, who asked me about the family's state of mind. Once he was satisfied that they were determined to go ahead, I was then requested to inform them that the Alcor Board had approved taking Roy as a non-member suspension. They were understandably delighted by this decision.

Mike then wanted to know the precise quantities of perfusion supplies we had on hand. We had stored our supplies at the home of a member, Geoff Lee, near Canberra, which is some 400 miles from Melbourne. There was therefore to be an inevitable delay whilst Geoff inventoried the supplies, loaded his car, and drove down to Melbourne. Other reasons, such as the unavailability of personnel caused more delays. After the conversation with Mike, Theo and I continued to talk with the relatives. We were shown a photograph of the family, including Roy. They were not only shocked at what had suddenly happened to their brother, but were also angry at what they perceived to be unfeeling and perhaps inappropriate treatment by his neurosurgeon.

As we were about leave, Terry Mulqueen, the cooperating mortician, arrived. He urgently needed personal information on Roy in order to get the paperwork for his journey to Alcor started. Since there was little Theo or I could add, I was concerned to leave. There seemed to be no clear demarcation of responsibilities and I wanted us to have the time to contact relevant

CAA personnel and decide what had to be done and when. Mindful of the legal hazards inherent in cryonics as practiced in the late twentieth century I was also worried because the family had not signed an agreement with Alcor at this advanced stage (in fact, this was not to occur for a further two weeks). The suspension thus started on simple trust. What if we had only met a pro-suspension part of the family? What if there had been a financial hitch? What if any number of problems had surfaced?

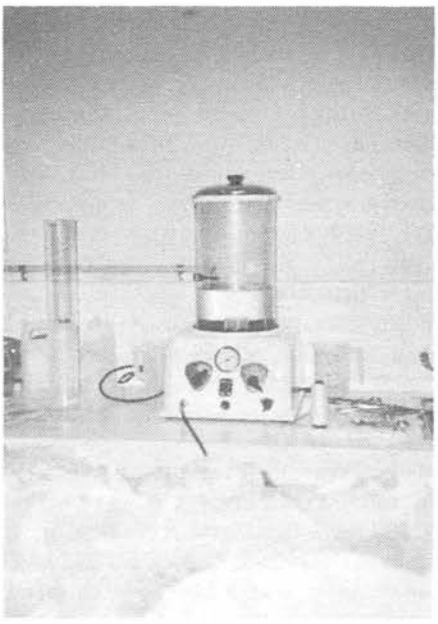
By mid-evening we were back at Theo's. The telephone had, and would continue to, ring off the hook. News was already leaking out along the international cryonics hotline and we impressed on all callers the need for discretion. The *last* thing we wanted was a *60 Minutes* crew. Amongst the callers was Geoff Lee, alerted by Thomas Donaldson. Theo and I briefed him and asked him to confirm the supplies we had on hand. Geoff then started loading his car.

As Theo, his family, and I ate a much delayed evening meal the phone continued to ring. Geoff reported that it would take him longer to load his vehicle than at first anticipated and, quite reasonably, he would need to rest before undertaking the drive (intercity roads in Australia are nowhere near the standards to be found in the USA, and the journey times are considerably longer and travel much more wearing). There being little more that either of us could do that night, Theo drove me back to my central city accommodation.

Given the problems facing us it was remarkable and fortunate that I managed to get a decent eight hours' sleep. When I awoke I contacted Theo and was told that Geoff Lee was en route and that the suspension would be conducted at a suburban mortuary in Ivanhoe, about ten miles from downtown Melbourne. As a courtesy I contacted Cath Woof, who is now residing just south of Sydney after living for several years in California (together with Thomas Donaldson, she had helped organize Alcor Northern California and been an Alcor Coordinator). Cath offered to come down, but I thought she would most likely arrive too late to be of any help. In the event, this would not have been the case, and I can only attribute my lack of foresight to the stress of the situation and our lack of contingency plans. I was also under the impression that there would be restrictions on the number of people able to work in what turned out to be an adequate, but cramped, facility.

Several hours later I made my way to Theo's home and awaited Geoff's arrival. He telephoned in at 16:30 from the Northern outskirts of Melbourne and we directed him to Ivanhoe. Theo and I then set out ourselves, stopping en route for some last minute items requested by Mike: salt, sample bottles for venous effluent (drainage fluid), and added glycerol to supplement our own limited store. I recommend trying to buy several liters of Pharmaceutical Grade glycerol early on a Sunday evening in Melbourne to anyone interested in challenging exercises. Thanks to some calling ahead by Theo we got what we needed without much extra delay.

Geoff was already present when we arrived, as was Peter Irvine, the embalmer who was to perform the surgery, and Michael Connaughton, who had had his dog suspended by Peter at the same site last year. Geoff and Theo went off to pick up 60 kilos of ice and bags to protect Roy during ice/salt cooling, as well as some film and batteries for the camera. Joe Allen, an Alcor member from the early days of the Institute for Advanced Biological Studies in Indianapolis, Indiana, and now a Melbourne resident, arrived to assist as well. At about the same time Terry Mulqueen also arrived bringing Roy with him (Roy had been maintained on water ice at Mulqueen's Burwood mortuary.). Michael and Joe began the unpleasant task of filling dozens of small bags with water ice to provide cooling for Roy, whilst I started to prepare the first "pass" or "flush" of perfusate containing 7.5% of glycerol.



The Porta-Boy embalming pump.

Our equipment was extremely basic, on a level equivalent to early suspensions of the late 1960's. To deliver the perfusate we had a Porta-Boy embalming pump. The "mixing/holding" tank on this unit is not calibrated accurately in terms of volume, so it could not be relied on for measuring out the volume of the various perfusate ingredients required to make up the solution. Fortunately, Joe brought along a graduated cylinder which allowed us to accurately measure out the ingredients. Other tools that were available were basic mortuary surgical equipment (arterial cannula, scalpel, scissors, aneurysm hooks, and clot forceps) and a standard 12" long mercury-type laboratory thermometer.

The first task was to prepare the embalming pump per the protocol that Mike Darwin had sent us, by first washing the pump and then flushing it with distilled water several times, and finally twice with several liters of particulate-free Normosol-R intravenous solution.

Just after 22:00 we loaded crushed ice onto the operating table and unwrapped Roy. At this point we noticed that he had been very well packed in ice, and further, that he must have air cooled to quite near 0C because very little of the ice he was initially packed in had melted.

We then transferred Roy to the operating table and quickly re-packed him with the previously prepared bags of ice. Peter then began the bilateral cutdown to raise the carotid artery and jugular vein on each side of the neck. The purpose of this procedure was to surgically access these major blood vessels so that cryoprotectant-containing solution (perfusate) could be circulated throughout Roy's tissues to provide some protection during subsequent cooling (and freezing) to -79C. Peter also opened the skin flap covering the craniotomy wound on Roy's

Roy, packed in ice on the operating table during perfusion. Left: embalmer, Peter Irving, Right: CAA member Michael Connaughton.

head and removed the bone flap which covered Roy's cerebral cortex. Once this was done, the large clots covering the brain surface were gently lifted away to allow visualization of the brain during subsequent perfusion.

As I began to measure out the perfusate components I noticed that, due to the cool weather (it's winter in Australia), our mannitol had partially crystallized out of solution on the bottom of the bottles. Before the mannitol solution could be added to the mixing reservoir it would first have to be re-dissolved. Whilst Joe Allen and Michael Connaughton warmed the mannitol to dissolve it I continued to measure out the rest of the perfusate components.

At approximately 23:30 we were ready to start the first pass of perfusate, beginning with the right common carotid artery. Perfusion was carried out using the lowest pressure possible with the machine to obtain drainage from the jugular vein. Almost immediately large blood clots 4" to 5" in length and about the diameter of the vessel began to emerge from the right jugular. Almost immediately there was also modest edema of the brain. After ten minutes the edema became pronounced and we stopped perfusing. We were using the laboratory thermometer to monitor Roy's temperature (the bulb was placed in the oral pharynx), as we were concerned that even though we had pre-chilled the perfusate, it might significantly re-warm Roy.

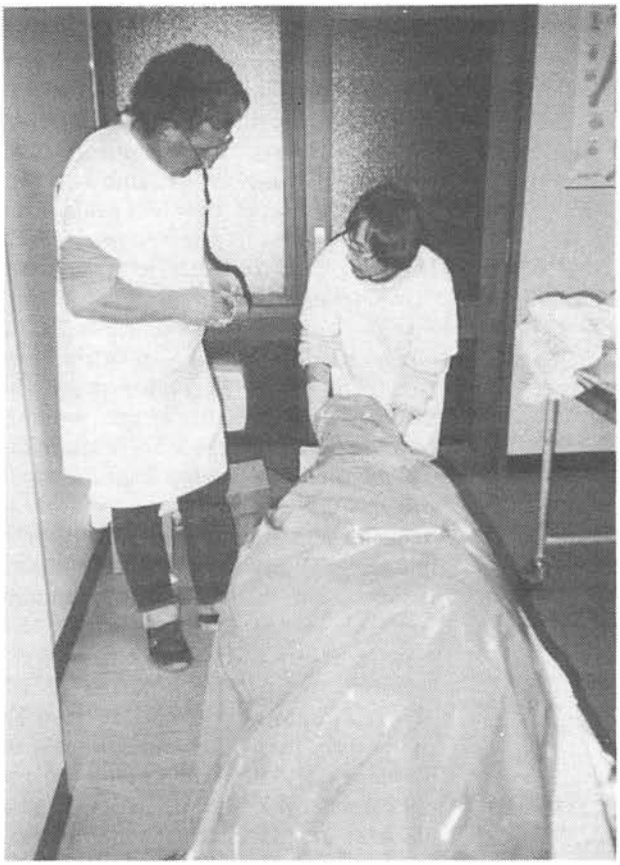
About the only good thing resulting from the perfusion was evidence that a substantial portion of Roy's cerebral cortex had been receiving blood flow right up until the time he experienced cardiac arrest. The evidence for this was that the arteries on the brain surface appeared normal in color and exhibited substantial clearing of blood during the brief perfusion period. Had Roy's brain been in a no-reflow condition for a prolonged period of time prior to deanimation, these vessels would very likely have been dark, clotted, and incapable of demonstrating blood washout with perfusate. A prolonged period of cerebral no-reflow would have resulted in brown-tinted or pink-tinted hemoglobin-stained brain tissue; we observed only normal-appearing brain tissue with appropriate pial brain surface color and no evidence of hemoglobin stain or hemoglobin denaturation (breakdown) as would be evidenced by a "brownish" color to the vessels.

Perfusion was recommenced at 23:50 via the left carotid artery and the pattern of heavy outflow of clots followed by poor venous drainage and further edema caused us to discontinue perfusion a few minutes later at 00:01. After consultation with Mike Darwin, who stood by all night on a more or less open line, it was decided to discontinue trying to introduce any more 7.5% solution to the head/brain and instead deliver the remainder of the volume (six of the eight liters) down the carotid artery to the body. Michael took venous effluent (drainage) samples for later analysis whilst I prepared the next eight liter batch of perfusate, liaised with Mike Darwin, and took photographs for Roy's patient records.

The second flush using a 22.5% concentration of glycerol in the perfusate began at 01:44 via the right carotid. However, due to poor venous return and a noticeable increase in facial and cerebral edema it was discontinued less than 60 seconds later. A decision was made by Mike Darwin to not attempt any further cerebral perfusion and to instead pass the remaining volume of solution down the carotid artery to the body. It took 57 minutes to pass 5.8 liters of 22.5% glycerol-containing perfusate through the body. This was done primarily to displace clotted blood (leaving the circulation more open for future repair efforts) and distribute antibiotics. Roy's temperature, as measured by the oral thermometer, starting out at 1C to 2C, had risen to 10C by the end of perfusion. Once the final pass was completed, perfusion was terminated, the skin flap covering the craniotomy was loosely closed and Roy was quickly cleaned up in preparation for transfer to the ice/salt bath as we were anxious to get his temperature down again and begin freezing him.

Ice and salt mixtures yield a temperature in the -15C to -20C range and thus are ideal for beginning the freezing process in the absence of more controlled fast cooling, such as with a silicone oil bath.

Both Joe and Theo had left much earlier in order to be fit for work the next day and Geoff Lee had retired to sleep in the back of Mike's van, exhausted from the long drive down. While Peter and Michael cleaned Roy up and wrapped him in a plastic tarpaulin to protect him from the brine that would result, I prepared the bed of crushed ice and table salt that was to receive him. Mike Darwin was very concerned about the possibility of brine leaking into the wrapping, getting into the craniotomy wound and injuring the brain. For this reason we placed an additional plastic bag over



Peter Irvine (left) and Michael Connaughton (center) wrap Roy in plastic sheeting in preparation for ice/salt cooling.

Roy's head and secured it to his neck with mortuary twine *before* wrapping him in the tarpaulin.

At 03:15 Roy was transferred onto the bed of ice and salt and covered over with a thick layer of additional ice/salt mixture. He was then wheeled into an adjoining refrigerated room (2-4C), where Michael and I monitored the ice/salt mixture level until Geoff Lee relieved us for a couple of hours around dawn. I was most grateful for this as I was beginning to perform like a badly programmed automaton.

At 08:45 Peter Irvine arrived with 90 kilos of dry ice. Rather hazardously (since we had only a few, unpadded pairs of gloves), we smashed up the dry ice with hammers into suitably small chunks. Roy was then removed from the ice/salt, left in the tarpaulin (which provided something of a thermal buffer as it was several layers thick) and repacked in crushed dry ice.

I stayed until Roy had been completely packed in dry ice and then left for my accommodation. It was 10:30, but I could not sleep and spent my last few hours in Melbourne wandering the streets mulling over the drama of the last couple of days. Later that day Michael constructed a crude but effective insulating box out of chipboard and styrofoam to cut the dry ice sublimation rate whilst we waited for the transport box to come from England. Fortunately, a local source of pelleted dry ice was found and this not only provided a much more snug fit of dry ice around Roy, but also cut the labor cost substantially.

A week later Roy left Australia for Alcor's long-term storage facility in Riverside, California. Selected elements of the media were present to witness his transfer from the temporary container to the shipping box. The media coverage was moderately good *[excellent by U.S. standards —Eds.]* although the story had leaked to the weekend "tabloid" gutter press a couple of days previously. There were no hassles with any authorities; it was as if the transport of cryonic suspension patients was a routine, everyday business (of course, our battles are yet to come when they realize how serious we are). Indeed, officials from the Australian government and the U.S. Consulate even called Terry Mulqueen to inquire solicitously if "paperwork had been processed quickly enough, and to his satisfaction." (The first time that's *ever* happened, according to Terry!) Roy left Australia on a late morning flight on 2 July, accompanied by his brother Tony, his sister Rose, and his mother Rosa Schiavello.

I am still thinking about the implications of this, the first Australian cryonic suspension. It has certainly revitalized cryonics in Australia and we achieved a record attendance of ten at CAA's recent Annual General Meeting. Decisions were made to raise money to fund equipment purchases from Alcor with the aim of achieving Alcor Coordinator status by March of 1991. We have received several serious inquiries and are now able to hold regular dinner meetings in both Sydney and Melbourne to attract more people.

We also appointed Cath Woof the suspension officer of CAA. This is really the most important position in our group, as she now has the job (with assistance from the other members, of course) of arranging our upgraded suspension capability and will have overall control of events during future suspensions. As backups we decided upon myself as the Sidney area alternate and Joe Allen as the Melbourne area alternate.

In hindsight of course, there are many things we could have done better. But, given that Roy had been deanimated almost 24 hours and experienced serious blood clotting before we even heard about his case (and a good 48 hours before perfusion was begun), I think we did a good job for him.

It was fortuitous that I happened to be in Melbourne, even though I felt "out of the loop" without a car, a telephone, or my files. I also felt that we were automatically at a disadvantage as no contract existed between Terry Mulqueen and CAA or Alcor and we were unfamiliar with his facility.

On the cheerier side, we have now had a practical demonstration of what to expect in an emergency and know who can be relied upon. I had expected some people to be considerably more squeamish over such a traumatic experience than they actually turned out to be. Michael Connaughton intends to undergo mortuary and Alcor training. There is much to be thought out before we are next faced with a suspension, sudden or otherwise. Based on our experience with Roy, we have started to lay out plans for future suspensions under different contingencies with more attention to having contact lists and defined lines of authority and communication.

Roy's suspension has taught us much, and for that we are grateful. We hope very much that we have contributed to the realization of his hope for future life.

Part III: Arrival In The U.S.

Mike Darwin

On June 29, we received notification by phone and FAX that Roy would be arriving in the U.S. on Qantas Airlines flight QF11, on July 2 at 10:25 AM PDT. On Sunday, July 1, during the closing minutes of the Alcor Board Meeting in Wrightwood, California I received a phone call (referred up from Alcor) from a journalist in Australia inquiring about the "cryonic suspension of Mr. Rocco Schiavello" and requesting details. This was totally unexpected and very disturbing. We knew from the start that the story of the first cryonic suspension in Australia would be major news there, and perhaps even create some stir here. We were very anxious, as was the Schiavello family, that there be no leaks or coverage until Roy was safely in our hands here in the U.S. All we needed was to have problems occur with customs on this end, or with the Australian officials or even the airline. There was also our desire to spare the family the glare of media attention at such a trying time, before Roy's suspension was even completed.

That was not to be. A few minutes before the flight's scheduled departure I spoke with Mrs. Costa and was informed that a veritable wall of media people with accompanying cameras and tape recorders had surrounded the three Schiavello family members who were going to fly over with Roy as they made their way to the aircraft. There was also reportedly a busy contingent of photographers and reporters at the loading of the shipping container, which was holding Roy, onto the aircraft.

On July 2, Alcor staffers Carlos Mondragon, Hugh Hixon, and Arthur McCombs set off for LAX to meet QF11 and transport both Roy and his relatives, mother Rosa, brother Tony, and sister Rosa ("Rose") Schiavello to Alcor in Riverside. They were met with an avalanche of press. Carlos was surrounded by a human wall of video cameras and reporters as he tried to make his way to the gate to meet the Schiavello's flight. It was only with difficulty that he was able to escort them to his car and head over to the Lufthansa airfreight terminal where the Qantas cargo, including the shipping box holding Roy, would be taken.

At the cargo terminal, Hugh and Arthur waited inconspicuously while the reporters milled around. Meanwhile, back at the lab, I received an unnerving call from Qantas inquiring about our authorization to pick up human remains (shades of the Department of Health Services!), apparently in response to the media circus going on outside their facility as well as numerous inquiries from journalists. After a little stroking and some authoritative reassurance, the freight manager hung up, apparently satisfied although still very edgy. A quick call was made to Alcor attorneys David Epstein and Chris Ashworth, and contingency plans were put in place in case further trouble should arise.

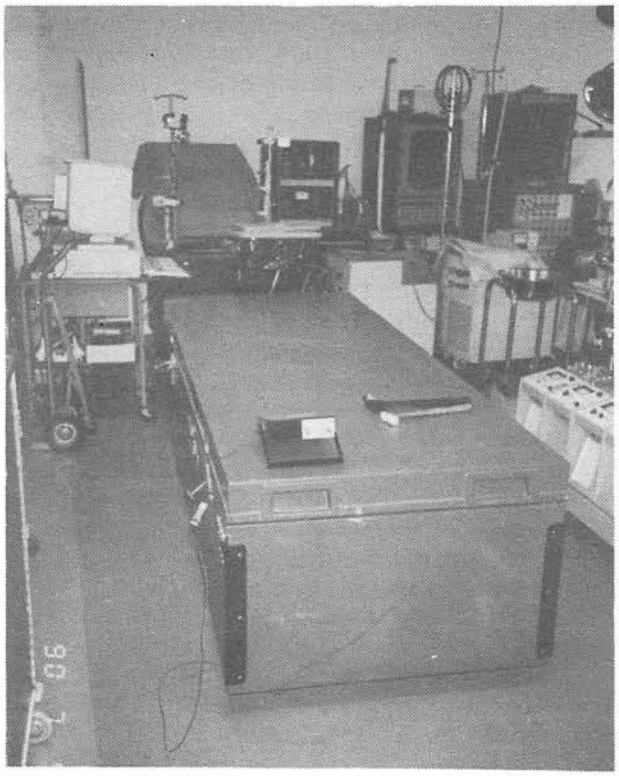
After a bit more bureaucratic shuffling, Lufthansa raised the door to the cargo facility and allowed the Cryovita van inside. They then closed the door to the facility, effectively barring the press from photographing the loading of the shipping box. This was a courtesy that was much appreciated and which is not normally extended to those picking up freight of any kind, including human remains, but the TV crew's intrusiveness had irritated the Qantas airfreight people considerably.

The Schiavello family and Roy arrived at the Alcor facility in the late afternoon. They had been up over 24 hours, had been on a 18-hour flight and had been able to sleep and eat little. They were exhausted, and after a brief once-over of Alcor's facilities, they were taken to a nearby motel to rest and recover a little.

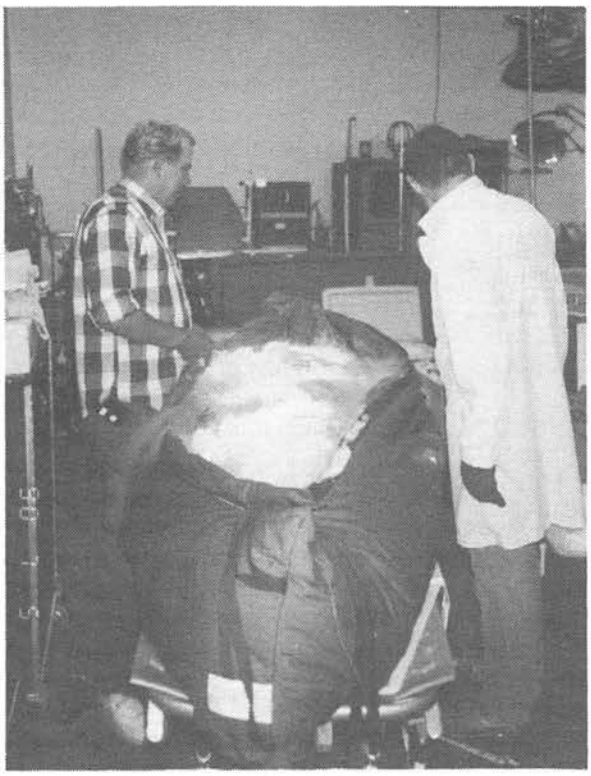
Upon arrival at the facility the van containing the shipping box had been pulled into the vehicle bay where the ambulance is normally kept, and the facility door quickly rolled down. The front gates were also secured at this time and facility staff were put on alert for the possibility of prying journalists.

Once it was determined that the press contingent had not followed Roy and the family to the facility, the van was partially backed out of the vehicle bay and the transfer box containing Roy was unloaded by fork-lift. Later that day, Roy was removed from the metal inner liner in the shipping box, quickly assessed externally, placed in a pre-cooled sleeping bag, returned to the shipping case, and recovered in dry ice.

Hugh Hixon then went back to work on two major engineering projects being carried out under tremendous time pressure, namely to quickly build a patient support system allowing the new Alcor Bigfoot Patient Storage Dewar to be pressed into service using our existing tray system, and



The Alcor U.K. transfer box containing Roy shortly after his arrival from Australia.



Jerry Leaf (left) and Mike Perry (right) prepare Roy for CT scanning by packing him in pulverized dry ice in an intermediate weather sleeping bag.

constructing a controlled-rate cooling lid to carry out the temperature descent from -79C to -196C (-320F) in a controlled manner. A controlled rate cooling lid for the A-9000M dual-patient whole-body dewars was already in existence, but all of the A-9000M units were full of patients in long-term storage and the existing lid was too small. Thus, a cool-down lid for Bigfoot needed to be fabricated on short notice.

Cooldown lids are important because they prevent stratification of chilled gas inside the storage unit during temperature descent. Such stratification could result in as much as a 100C difference in temperature between the patient's head and feet. The Alcor cooldown lid addresses this problem by vigorously stirring the atmosphere inside the dewar and adding liquid nitrogen in a controlled fashion using a timer-controlled valve.

While this work and other preparations were underway, the Schiavellos took some much-needed time off to explore Southern California and recover. During this interval arrangements were also made to obtain CT scans of Roy's head to attempt to determine the extent of the surgical procedures carried out during the unsuccessful attempt to remove his deep-seated brain tumor. This was necessitated in part because of the treating surgeon's and the hospital's refusal to release Roy's medical records, including his operative reports and any pre- and post-surgical CT scans. (These records were ultimately obtained under the Australian government's Freedom of Information Act, which was used to free-up Roy's records from an un-cooperative hospital/surgeon.)

On July 5, Roy was removed from the shipping box and placed inside another heavy-duty, intermediate weather military-style bag which had been stripped of all metal fittings to prevent interference patterns on the CT scans (the inner bag was metal-free to begin with). Pulverized dry ice was them placed between the two bags and the outer bag was zipped closed.

Roy was then loaded onto an ambulance cot and taken to the CT scanner which had been summoned to the Alcor parking lot. The scanner is housed in a large van and its 275 kW power supply is carried by another, smaller truck. Axial scans were made at 5 mm intervals of Roy's head, chest, and upper abdomen. These films revealed incomplete removal of the tumor and the expected cerebral edema. It is anticipated that the films, along with pre-surgical scans obtained after Roy's suspension, will be evaluated by a competent radiologist and neurosurgeon for addition to Roy's medical records. Following the CT scan, Roy was removed from the outer bag, replaced in the transfer container, instrumented with external thermocouple probes on his head and abdomen, and re-covered with dry ice.

On July 6, preparations were completed to place Roy into long-term suspension. A film crew from CBS' *48 HOURS* was also present to film the transfer from dry ice to liquid nitrogen. The operation proceeded smoothly. Roy was removed from the transfer box already in place in a sleeping bag and moved onto an ambulance cot. Conventional posterior-anterior and lateral skull X-rays were then taken while Roy was on the gurney.

Roy was then transferred to a standard pre-cooled storage stretcher, moved into the patient care bay, and hoisted through the skylight for vertical placement in the Bigfoot dewar. Once in Bigfoot, the cool-down lid was put in place and the descent from dry ice to liquid nitrogen temperature was carried out over the next 24 hours.

The mobile CT scanner in the Alcor parking lot.

Tony (left), Rosa (center), and Rose (right) Schiavello on the day of their departure from Alcor to return to Melbourne.

On July 11, two other whole body patients were transferred from the A-9000M dual patient dewar they were in previously to the Bigfoot unit with Roy. Within the next few months it is likely that all Alcor whole body patients will be repackaged into radiolucent cassettes which provide more comprehensive thermal and mechanical protection during subsequent transfers.

Organizational Trust

Thomas Donaldson

A recent article in *Cryonics* has raised (correctly) an issue very important to our efforts to sign up people for cryonic suspension, and thus to the growth of cryonics itself. It's not a new issue at all, but I am unhappy with some proposed attempts to deal with it. Since there's been little explicit discussion of the problem, it deserves attention.

The problem is simple. OK, so you've decided that cryonic suspension is a *good thing*. You've gone through all the arguments. The idea of physical immortality doesn't bother you, nor does the idea of suspension. You've decided to take *action*. And so you go out to find a real operating cryonics society with which to make your arrangements.

And what do you find? Only a few small groups of struggling cryonicists, each waving the flag of its own organization. So which of these do you join? Or perhaps, shocked at the tiny level of organizational support cryonics has achieved, you decide to wait until the whole enterprise grows bigger — if it will grow bigger at all, which, suddenly and upon close viewing, you have started to doubt.

The problem is that cryonic suspension arrangements aren't made with the air. They must be made with some serious and real organization, and compared to most of the enterprises out there, all cryonics organizations are small and (at least apparently) unstable. To use a complaint used against us by certain regulatory officials, we don't even have licenses. Because we are, after all, small, and likely to remain so for some time, this problem will stay with us for decades.

Historically, our problem isn't unprecedented at all. In the 19th Century, many attempts were made to found life insurance companies. Many of these attempts went under, simply because they could not gather together enough live clients to keep afloat. A life insurance company, in a setting in which life insurance is a new idea, has many of the same problems that we face: we need the people to get the people. (On the other hand, believe it or not, our situation may be better. We can perform cryonic suspension and storage with far fewer people than could support a life insurance company. We might be heartened by that fact when we look at the property now owned by all the life insurance companies. They didn't just overcome this barrier, they ended up as major economic players).

What can we do about this problem? First, any cryonics society

should be very open with its members, about its financial affairs especially, but about other issues too. If it is *not* open and does *not* make a policy of keeping its members faithfully informed of its affairs, it becomes subject to much more suspicion. That suspicion is even correct: if I understand the CSC disaster (Chatsworth, as many cryonicists call it), lack of complete openness to its members contributed to the demise of CSC.

For candidate members, this openness is crucial. Anyone looking around for a cryonics society with which to sign up can easily be convinced that they are not signing up with a fraud or a scam. All it takes is complete openness about the society's affairs.

At some stage, this openness will conflict with privacy. I believe the matter is so important that it should be *policy* to request of members directly their authorization to let their names be known. No one should have his/her privacy violated, but everyone should understand that those with determined suspicion will want to know who we are, not just who the administrators of Alcor are. At Alcor North we keep a special public list of telephone numbers and addresses for every member willing to allow that. I believe that such lists are an important practice. How else can we convince people that we're not just a boiler room scam?

Second (and this may really hurt), it's to the interest of every cryonics society to present an image that even if it goes under, its minimum responsibilities for storage will still be carried out. Unfortunately, with three major societies we have three differing ideas about the funding required, the technical level of the suspensions, and the conditions of storage. With cryonics beginning to take root in other countries, this problem may even get worse.

One possible approach is a mutual arrangement to take one another's patients in the event of a local collapse, with the requirement that they be cared for under the same terms as they signed on. (Since one reason there are three societies is a deep disagreement about the specific terms under which someone should be suspended, clearly this will cause negotiating problems. Also, it raises the possibility of one society allowing people to sign on at much lower rates, then going bust, leaving other societies to care for their former patients).

We want to help bring about a situation in which, so long as there are any cryonicists at all, patient storage will be maintained.

Here is another suggestion. *We* know that our own societies each have significant numbers of members. Even if all of Alcor's current administrators and current Suspension Team were hauled off to jail, many of Alcor's Suspension Members would remain. Their problem would be that of rapidly acquiring legal status to take control of Alcor's patients. If another society could step in to help, providing its own legal umbrella for a special group of "former members of X cryonics society" to those members who remain, then there would still be a *corporation* to take over the care of these patients. Other legal preparations for easy transfer of funds and patients deserve close attention. (For instance, dummy societies ready to receive both members and patients could be set up.) After temporary transfer, the former members could go on to found a successor society or even remain with their rescuer.

The Dora Kent case at least should tell us that arrangements like this may someday become very important indeed. Of course, members of *every* cryonics society believe that theirs will outlast all problems, and that these disasters can only happen to *others*. We have all heard this idea elsewhere, and joined a cryonics society because we disagreed.

In essence, the aim of these proposals lies at the bottom of any legal structure. We want to help bring about a situation in which, so long as there are any cryonicists at all, patient storage will be maintained. This means that cryonicists should be able to contact one another easily (e.g., via the "cryonics telephone book" raised before). It means that we should employ existing legal mechanisms to ensure rapid formation of another society to take responsibility toward the patients of any that becomes defunct. If the cryonics societies cannot agree on conditions for storing one another's patients, then they may still agree to help members of another society gather together again in an emergency.

Finally, I'd like to discuss an alternative raised several times here and elsewhere, one that bothers me a good deal. This is the idea of trying for placement of patients in permafrost as a last resort. What bothers me about this isn't its use in the absence of any other cryonicists able to manage storage; currently, it's far too close to burial to deserve much consideration, though that may change. Rather, I am bothered that it tries to bypass or remove one truly essential principle of cryonics itself.

Cryonics isn't really about freezing at all. It is about preservation and patient care in the best state in which we can keep them, with an eye toward their eventual revival. It is the cryonics societies that take on this responsibility for preservation, care, and reanimation. It is the *cryonics societies* that make suspension itself more than a simple throw of the dice: they, collectively, are the people who will someday revive us. They will work for our preservation and for our eventual revival. If we fail, we pass this duty on to others. We intend this human effort *by cryonicists* to bend the universe to our favor.

No one can expect revival and preservation without this effort. If simply left abandoned, no matter in how durable a form, eventually wind, weather, animals, the change of climate will destroy you. And if you are not destroyed, then 100,000 years from now you may indeed be unearthed: not for revival but for *archival* purposes, one more object from the remote past. (Look at what has been happening with Indian graveyards in the U.S. Who is it who cares for them now? And if there were no more Indians. . . ?)

The Society for the Recovery of Persons Apparently Dead

by Steven B. Harris

"The human mind treats a new idea the way the body treats a strange protein; it rejects it."

— Biologist P.B. Medawar

The history of technological innovation is the history of the torturous paths which advances often take to acceptance. It might seem at first, from the many well-known instances of simultaneous discoveries, that it is the nature of important ideas to spring up newly everywhere, independently, as soon as the world is ripe for them. But this is only the view at first glance. In actuality, the "synchronicity" of discovery usually turns out to be a late phenomenon, one that follows a prodrome in which the "new" idea in question has long been around in some form or another, but has been steadfastly ignored.

How long can an important idea be ignored? The model steam engine was demonstrated by Hero of Alexandria in the first century A.D., sixteen centuries before people started thinking along these lines again. Gregor Mendel published the basic principles of genetics in 1866, and was ignored until 1900. Oswald Avery published strong evidence that DNA was the principle of heredity in 1944, but no one really believed it until the time of Watson and Crick almost a decade later. The time varies, depending on circumstance.

Delayed acceptance of discovery happens in all areas of science, of course, but it always happens in the field of medicine with great poignancy, since there the human costs of dropping the technological ball are usually great. We may consider, for instance, the numbers of lives which might have been saved if not for the following delays:

- Leeuwenhoek invented the microscope in 1668 and saw animal cells and protozoa with it — but unfortunately for humanity, doctors weren't interested in that kind of thing in 1668, and wouldn't be for another couple of centuries. In the meantime they missed out on the germ theory of infectious disease, and thus, as late as 1850, when good Doctor Semmelweiss tried to get his Hungarian colleagues to curb the incidence of fatal "childbed fever" by washing their hands between dissecting diseased cadavers and examining patients, his colleagues responded by hounding him out of his job. Meanwhile diseases continued to spread on the hands of well-meaning doctors.

- Several explorers like Sir Richard Hawkins independently discovered the antiscorbutic properties of oranges and limes in the 18th century, and James Lind in 1754 even published the results of a controlled experiment in which he showed that citrus was superior to other folk methods for the curing of scurvy. The world, however, was not ready for the discovery, and sailors continued to suffer and die from this quite treatable nutritional disease for more than half a century after Lind's demonstration. Scurvy was also rampant among the troops of both North and South during the American Civil War, though the means was available to prevent it, and as late as 1912 the famous explorer Robert Falcon Scott died on his way back from the South Pole, probably as the result of scurvy.

- An investigator *before* the First World War discovered the curative powers of *penicillium* mold extracts on infected animals, but could not interest his colleagues, although he published the work. It remained for Alexander Fleming, ignorant of the earlier work, to rediscover the antibacterial effect of *penicillium* in a laboratory accident in 1928.

- Alexis Carrel, the French-American scientist who won the Nobel Prize in 1902 for techniques of suturing blood vessels, demonstrated in 1910 that a saphenous vein graft between aorta and main coronary artery in animals could bypass a blockage there, and speculated that the technique might be useful in the treatment of angina. Although Carrel (with aviator Charles Lindbergh) later went on to develop the heart-lung machines that would make such surgery possible, the medical community contented itself for the next half-century with ineffective treatments for severe coronary heart disease, and it was not until 1967 that the saphenous-graft coronary bypass operation was employed on humans.

To the historian, some medical fields seem more plagued with delays in the acceptance of new ideas than others (the medical study of infectious disease has been prominent in this dubious regard, as noted), and the above examples are sad enough. Still, there is possibly one field of medicine which is at least the equal of infectious disease in its record of ignoring proven lifesaving strategies for the longest time, and that is the area to which we will turn for the remainder of this essay. The medical field in question is that of *resuscitation*, which is the art of restoring clinically dead people to life. It will be of no surprise that many of the issues related to it which have been debated in history are also familiar to cryonicists. For example: when exactly is a person "dead," and how do you tell?

Cryonicists looking into the history of resuscitation may find themselves reading with a sense of *deja vu*. We've seen these controversies already, and we'll see them again. Perhaps we can profit by exploring them further.

Resuscitation

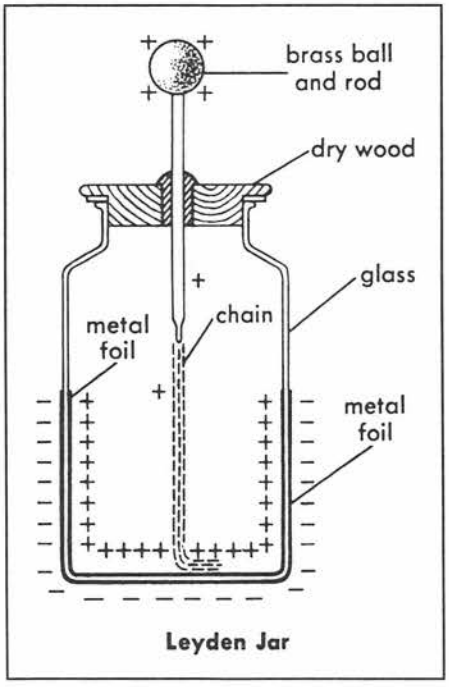
Historically, the art of resuscitation turns out to be old. The idea of resus-

citating a seemingly dead person by more or less physical means occurs in the Hebrew scriptures in the book of *II Kings*, as Elisha resuscitates a dead child by placing his mouth on the child's mouth (*II Kings* 4). Although the story appears a bit garbled, like the story of Elija's [N.B. — Elija and Elisha are different guys] resuscitation of the child before it in *I Kings 17*, both stories contain descriptive elements of chest compression, and there is clearly something more than mystical prayers and incantations going on. Perhaps the oral traditions which were later codified into these tales once contained descriptions of one or more real resuscitative events.

By a few millennia later, things were better defined. Italian writings of the 15th century indicated that midwives had, even then, long been using mouth-to-mouth breathing techniques to resuscitate newborns who did not spontaneously breathe. These techniques were soon to be imitated in the mechanical experiments of the Enlightenment. Paracelsus (1493-1541), an alchemist and perhaps the greatest physician of his age, was said to have attempted the resuscitation of a corpse using bellows, a trick he perhaps picked up from Arabic medical writings. And Andreas Vesalius (1514-1564), the father of modern anatomy, reported successfully using bellows to resuscitate asphyxiated dogs.

Bellows may not always have been available, but physicians eventually learned (possibly again from laymen) that simple mouth-to-mouth resuscitation sometimes worked on recently asphyxiated adults just as it did on newborns. By the 1740's, several cases of successful mouth-to-mouth resuscitation had been reported, the most famous of which was Tossach's 1744 report of the resuscitation of a clinically dead coal miner who had been suddenly overcome after descending into a burned-out mine. By the 1760's, in the wake of such reports, a number of groups advocating the resuscitation of drowned persons had sprung up in Europe. The thinking at this time in many places was strikingly modern. Here, by way of example, is a quote from a 1766 governmental edict from Zurich:

"...Experience has shown that the drowned who are considered dead and that lay for some time under water have often been restored again and kept alive by proper maneuvers. From which one rightly concludes that life has not been completely suspended in the drowned, but that there is hope to save them from death if, as soon as they are withdrawn from the water, prompt and careful help is administered."



Leyden Jar

The Swiss may have been their usual regulation-happy selves about the subject, but in the rest of the Western world resuscitation was being pushed — typically by entirely private societies (voluntary clubs). In 1774, a society was founded in London to promulgate the idea of attempting to resuscitate the dead in some circumstances. Called, after a bit of experimentation, the *Society for the Recovery of Persons Apparently Drowned*, it quickly evolved into the *Humane Society* (and still later, with official patronage and funding, the *Royal Humane Society*).

The Humane Society advocated techniques which were highly advanced. Three months after the society's founding, as an example, a society member had the opportunity to minister to a 3-year-old child named Catherine Sophie Greenhill, who had fallen from an upper story window onto flagstones, and been pronounced dead. The society member, an apothecary named Squires, was on the scene within twenty minutes, and history records that he proceeded to give the clinically dead child several shocks through the chest with a portable electrostatic generator(!). This treatment caused her to regain pulse and respiration, and she eventually (after a time in coma) recovered fully.

[This story and other direct quotations, unless otherwise noted, are taken from *The History Of Anesthesia*, Richard S. Atkinson and Thomas V. Boulton, eds., International Congress and Symposium Series, #134, Parthenon Publishing Group, NJ, 1988. ISBN 0-929-858-18-2 (Parthenon).]

The resuscitation of little Catherine Greenhill was probably the first successful cardiac defibrillation of a human being, and it followed earlier suggestions by American scientist Benjamin Franklin and others that electricity might possibly be used to "revivify" the human body. And so it proved able to do in certain circumstances. In 1788, a silver medal was awarded to Humane Society member Charles Kite, who was by this time was not only advocating the resuscitation of victims in cardiac arrest with bellows and both oropharangeal and nasolaryngeal intubation, but had also developed his own electrostatic revivifying machine which used Leyden jar capacitors in a way exactly analogous to the DC capacitative countershock of the modern cardiac defibrillator. (I have to confess that to my mind all of these contraptions are as fantastic as the devices in a *Flintstones* cartoon, yet they actually existed. A time-traveling physician from the present could not have put together a better resuscitation kit, given the technology of the time.)

Dark Clouds

However amazing its progress was, the enlightened state of the late 18th century as regards resuscitation was not to last. From the very first, dark images from the human psyche began to gather in resistance to the new ideas. Technology never intervenes in a major way into the borderland between life and death without creating major anxieties and social backlash. Resuscitation had its problems.

To begin with, as the modern reader may guess, the 18th century discovery that "death" was not a sure and objective state did not exactly sit well in the public mind. Our historical friend Charles Kite was of the opinion that not even putrefaction was a sure sign of permanent death, since it might also be due to advanced scurvy(!). However

conservative this view might have been for Kite and his medical agenda, the public had its own concerns. If one could be mistaken for dead when one was in fact resuscitatable, the public was wondering, just what else did that imply?

The answer, of course, is that it implied that you could be buried alive. Not long after the first word-of-mouth reports of adult resuscitations began surfacing in the 1730's, the French author Jacques Benigne Winslow published a book descriptively titled *The Uncertainty of the Signs of Death and the Danger of Precipitate Interments and Dissections*. Now the real problem with the difficulty of defining *death* in a technical age was out of the bag: *What if you got the diagnosis wrong?*

The result of this realization was a psychological terror perhaps made familiar to the reader by some of the works of Edgar Allan Poe. But Poe, popularizing the problem for early 19th century America, was late to the controversy. In 18th century Europe the fear of premature burial and dissection was not just the preoccupation of macabre writers; whole classes of people were affected, albeit in different ways. Upper-class persons took to fitting coffins and crypts with special signaling devices which could be used to alert the outside world in case the occupant should inexplicably revive. The lower classes had their own special problems, too, since anatomical dissection (long a part of the punishment for heinous crimes because it denied the malefactor an intact bodily identity or a grave) had now taken on a special meaning. Here, as example, is what Ruth Richardson says of the dissection of criminals in her treatise *Death, Dissection, and the Destitute,* describing an incident in the 1820's in which one dissecting anatomist at Carlisle was killed, and another severely wounded, by the friends of an executed man:

"...Although this was of course an extreme reaction, it was certainly the case that hanging the corpse in chains on a gibbet was popularly regarded as preferable to dissection. What later incredulous commentators seem to have missed or misunderstood was that in eighteenth and early nineteenth century popular belief, not only were the anatomists agents of the law, but they could be the agents of death. Genuine cases were known of incomplete hangings, in which the 'dead' were brought back to life, and plans for celebrated corpse-rescues centered on the possibility that the noose had not fully done its work. Folk-tales circulated about famous criminals revived by friends, and these ideas were fostered by the publicity which Humane Society resuscitations attracted after apparent drownings. Increased control over the body of the condemned rendered rescue and revival virtually impossible.

*It was popularly understood that the surgeon's official function and interest in a murderer's corpse was not to revive, but rather to destroy it. Dissection was a very final process. It denied hope of survival — even the survival of identity after death [!]. Above all, it threw into relief the collaborative role of the medical profession in the actual execution of death. The Carlisle surgeons bore the brunt of the resentment and frustration felt by the dead man's friends, for in their eyes the doctors had murdered him more surely than the hangman's rope."**

By the end of the first quarter of the 19th century, when the riot over the dissection of the hanged man at Carlisle took place, things had reached a fever pitch. With scientific resuscitation, technology had intruded into the macabre. The horrific potential of the new electromechanical resuscitative technology had its influence on Mary Shelley, who in 1818 had first set out to write a ghost story, but instead ended up producing a cautionary tale of the technological resuscitation of a soulless corpse by a medical experimenter. Given the spirit of the times, the story touched a public nerve as though with one of the new electrical machines, and Frankenstein's monster was an instant sensation.

And then something strange happened. Shortly after the publication of Shelley's famous story, the new medicine began to go out of favor, and the science of resuscitation began to suffer on both the technical and mythological fronts. It happened for several reasons.

It is the propensity of all social movements to go too far. The Humane Society's problem was that, when it came to complicated biology, the late eighteenth century did not possess the experimental expertise necessary to separate the wheat from the chaff. Thus, within a few years after its founding, the Humane Society had gone from mouth-to-mouth resuscitation to the more impressive use of bellows. Following a number of instances of lung rupture with the bellows, however, these complicated and difficult-to-use devices were discarded early in the nineteenth century. Mouth-to-mouth resuscitation, unfortunately, was not reinstituted at that time, partly because of the new discovery of life-giving oxygen and the finding that expired air contained less of it (nobody bothered to find out if the difference was significant). For the next century and a quarter, therefore, resuscitative techniques centered around chest massage and armlift techniques, and mouth-to-mouth breathing did not return *until the middle of the twentieth century.*

Emergency electrical defibrillation fared no better. The new phenomenon of electricity had been transformed early-on into a quack cure by the practice of "galvanism" (passing mild shocks through the body in an attempt to cure disease), and its reputation accordingly tarnished. Later, and perhaps

* The denial of the body of the heinous criminal to the family has had a long history in law, and we see it historically employed in capital crimes which particularly outraged the public, even in relatively recent times. For instance, after execution in 1865 the bodies of the four Lincoln assassination conspirators were immediately buried in Army equipment boxes a few feet from the gallows in the prison yard in Washington's Old Penitentiary, the same institution where the body of John Wilkes Booth had been secretly buried a month earlier. In 1901, after anarchist Leon Czolgosz was electrocuted for the assassination of President McKinley, his body was dissolved in acid in the prison basement. One cannot read such accounts without a deeper appreciation for the psychological power of the freshly dead body in an era when resuscitation was still somewhat magic. Even as late as 1946, after the ten members of the Nazi high command were hanged at Nuremburg, the Surgeon General of the United States himself was turned down when he asked that the brains be removed, preserved, and sent to Washington for study. Instead, the bodies were cremated immediately at Dachau and the ashes secretly scattered, with the specific intent that nothing remain. One may read into official penal policy in all these cases a more or less unconscious desire to destroy what was perceived as the continuing identity of persons already pronounced dead. — S.B.H.

even more devastatingly, the charming new electricity was transmuted into a powerful and dangerous force by the giant transformers of Westinghouse (maligned from the first for their deadliness, in a PR campaign by rival industrialist-inventor Thomas Edison) and by the newfangled American electric chair. Technologies as well as people suffer from social stigmas. Mary Shelley had originally not specified the method of the revivification of her monster, but by 1930, in the new electrified America, Frankenstein's monster came into the movies electrically charged. The upshot of all these social transformations was that therapeutic electric shock, so full of promise in the 1790's, did not again come into its own for lifesaving purposes (or even for psychiatric purposes, for that matter) until about the same time resuscitative breathing was being reassessed, in the late 1950's.

Other resuscitative techniques like chest/cardiac compression had been used sporadically since the late 19th century as well, but they too did not see acceptance until the late 1950's, when almost inexplicably all of the "modern" techniques came together approximately simultaneously in what we know as "cardiopulmonary resuscitation (CPR)." The world, apparently, was not ready until the Space Age for any of these techniques, and simply rejected them when brilliant and well-meaning scientists invented them too early.

Some General Observations On History

What are we to make of all this? Is there anything to be learned? In looking at the history of resuscitation and medicine we might ask if there are any observations to be made about it which might apply as well to the medicine of today and tomorrow.

The first thing we notice is that there seem to be some themes in medical history which occur again and again. Important medical discoveries, like important philosophical discoveries, seem quite likely to be made by outsiders. In some cases, the "outsiders" in medicine have been doctors working outside the traditional groves of academe, and in others, the important medical discoveries have not been made by doctors at all. Leeuwenhoek, for instance, was a haberdasher, Pasteur a chemist, Fleming a bacteriologist. Recall that mouth-to-mouth resuscitation was the secret of midwives, and passed to medicine quite late. The original Humane Society, though founded by a doctor, was less a professional medical group than a group of ordinary and somewhat evangelistic citizens who (in exactly the manner of cryonicists) had banded together for humanitarian reasons and out of fear of being buried alive.

A second observation which can be made about the history of medicine and technology in general is that discoveries depend for acceptance upon a very complex social milieu which may have little to do with technology. A technological advance will not be accepted in a world which is not ready for it socially. The idea of using a steam engine to replace human muscle, for example, will not catch on in a world where human muscle power, because of slavery, is cheap. Conversely, a device like the cotton gin, which replaces delicate work with muscle work, will instantly be accepted in such a world.

For an analogous example of this phenomenon from medicine, we might consider the history of anesthesia. As we know from their writings, Muslim physicians practiced various forms of anesthesia during surgery back as far as the 8th century A.D. In Christendom, conversely, where the idea of redemptive suffering held sway, anesthesia took much longer to catch on. Thus, the anesthetic properties of nitrous oxide had been widely and publicly noted by Sir Humphrey Davy as early as 1798, yet it was not until the 1840's that an obscure general practitioner from Georgia and a couple of part-time dentists (remember our observation about outsiders) began to try out inhaled anesthetics for surgical purposes. Even at that, there was an ecclesiastical outcry when Queen Victoria requested chloroform for childbirth, soon after the first anesthetic demonstration in America. One prominent cleric complained that "travail and pain" in childbirth had been ordained by God in the Bible, and that therefore anesthesia was against the will of God. (Others pointed out *Genesis 2:21* where Adam is put to sleep as the rib is taken for Eve. Scriptural wars can be quite inventive.)

What then held up full cardiopulmonary resuscitation until the late 1950's, even though the world had discovered all of its essential features before 1900? We can only speculate, but the answer may lie in the fundamental change in the way which people began to relate to and trust technology between 1900 and 1950 — a social change which is as profound as any generation of humans has ever had to cope with. (See Frederick Lewis Allen's book *The Big Change: America from 1900 to 1950.*) Mythmaking, as ever, played a role. If technology first crept into our nightmares with Frankenstein, it later (redemptively) crept into our heroic myths and won some measure of acceptance. Thus, if the new 20th century technology of aviation was capable of creating a new kind of hero like Charles Lindbergh, the public was also willing to let him have a technological shot at Death with his new artificial heart machine. In any case, the mantle of Dr. Frankenstein had by the middle of the 20th century passed to the physicists and their atom bombs, and medicine for the time being, was at last back in the heroic mode. (See the book *Microbe Hunters*. This situation continued until the development of the modern ICU and "life support," at which time doctors and medical technology began taking heat once again.)

Cryonics

In the context of some of the foregoing observations, it is interesting to consider cryonics as an unaccepted technical idea. The study of history always offers perspective. Thus, if we cryonicists shudder with dread over the idea of a "premature" burial, or the idea of a viable person being destroyed by the autopsy knife, we may be a bit chastened to find that this conflict is already two centuries old, and not over concerns invented entirely by us.

As a practical matter, it might first be well to remind ourselves of the sources of danger in these situations. It takes only a change in point of view to regard a person in full cardiac arrest as being in a desperate and life-threatening situation for not just a few minutes, but (perhaps) days. This, in turn, may change the whole tenor of the game, for having a loved one in a desperate situation can engender the most desperate acts. Historically, as we have seen, violence has been committed over the question of dissecting a relative who might be viable, and as we have also seen, this very situation is a prime area of potential conflict between cryonicists

and society. (We have seen cryonicists taken into custody over this question, though fortunately not yet for long.) All of this should re-emphasize the need to do tremendous amounts of prior legal preparation, if we are not eventually to be faced with the otherwise inevitable situation in which a cryonicist is charged with the assault of a coroner or pathologist.

Of course, the question of viability holds another danger specially for cryonicists, over and above our potential conflict with government. If a man in the throes of grief is capable of killing on behalf of a potentially viable "deanimated" loved one, then the refusal of "last-minute" cases (no matter the circumstances) places cryonics organizations in a potentially explosive confrontation with the public as well. Here, *cryonicists* are the potential targets. We have seen cases in the news where distraught relatives have killed ER physicians in the midst of grief and misplaced anger. Might not then the same violent action be directed at representatives of a cryonics organization which was in the position of being (technically) able to rescue a viable person, but (for necessary financial reasons) refused to do so? If history is not to be repeated, it is clear that security concerns are going to have to be paramount for cryonicists in the future.

What about wider concerns? Here, too, the past has something to teach, this time about groups of concerned people who began as outsiders to established medicine, yet later prevailed. Although the cry of "They laughed at the Wright brothers, too!" has long been the defense of crackpots, even a cursory examination of the history of medicine shows that the initial non-acceptance of any important new idea by that profession is almost *de rigueur*. Thus, although the mere fact of medical non-acceptance does not prove the cryonicists' cause, at the same time cryonicists certainly do not necessarily need to suffer embarrassment on that score. The long view of things is helpful. At present, it seems likely that cryonicists play the role of the midwives of old, practicing their own peculiar lifesaving ministrations in parallel with medicine. Medicine's recognition of cryonics, like its belated recognition of resuscitation, will come.

When? Unfortunately, history is not prophesy. The answer from the foregoing discussion, if there is one, is that it will come when society is ready for it. We know that humans are not naturally very good scientists (our brains weren't developed for that), and very primitive needs and fears drive both acceptance and rejection of new technologies. As we've noted, the fear of premature burial drove an entire series of electrical defibrillation experiments in the late 18th and early 19th centuries, all of which then were suppressed for more than a century partly because the idea of shocking people back to life had in turn been killed by a single well-placed monster myth. Human beings and their societies run on good stories, not scientific reports. Similarly, American society of the 1960's, gearing up for a holy war on cancer and heart disease and intoxicated with the Salk-myth of the all-powerful medical researcher, was not ready for cryonics. By the late 1980's, however, when it had begun to become apparent that heart disease and cancer (not to mention aging) were a lot more intractable than polio, there existed in this society at least a subculture that was now ready to listen to another idea for cheating death.

And so here we are. From a strictly technical view, cryonics as we know it might have been practiced 70 or 80 years ago. Technically we might have been ready for it, but culturally we were not. What is more (let's face it), American society *as a whole* is *still* not ready to listen to the idea of radically extended lifespans. The good news, however, is that with the publication of a number of popular gerontology books in the last decade, things are changing slowly. The social milieu (not to mention the age of the population) is changing, and scientific immortalists are getting ready for another try at the hearts of the public. As has been argued in previous essays, this change will require yet another set of new myths (hero stories) to counter Frankenstein's monster, just as our out-of-body experience stories now let us, as a society, deal with the ambiguity of complex resuscitations from clinical death (see the movie *Flatliners*). In the case of cryonics, the new myths will come, too. We can only hope for all our sakes that this necessary process doesn't take as long as it sometimes has in the past.

Buying Time

by Joe Haldeman

Book Review by Ralph Whelan

This book is dedicated to the interesting people doing research in life extension, cryonics, and other such intimations of immortality. May you outlive your critics.

(From the Dedication page of *Buying Time*)

Buying Time hit the market in June of 1989. That's fifteen months ago, as those quick on their fingers can attest, leaving this review a full *five seasons* unfashionably late. Considering the subject matter of the book, as well as the above dedication, I think that Mr. Haldeman deserves a formal, printed apology for this. Unfortunately, I am not in a position to offer this apology. Perhaps we will see The Powers That Were circa June of last year emblazon this page from On High.

(We were graciously provided a proof copy of Buying Time, *and read it, but decided not to review it because it didn't say anything about cryonics, and the future it portrayed seemed implausible on a number of levels. Notwithstanding, it was a fun read. Recently several people brought it to our attention again, so we commissioned Ralph to do this review* —HH.)

The Premise

We're about 90 years in the future, in a timeline where any oldster can purchase youth from the Stileman Foundation for "one million pounds or [his/her] total net worth, whichever is greater," but where otherwise Pollyannaism has gone the way of the Spotted Owl. The treatment always wears off in

ten to twelve years, and you *must* start those years flat broke. Hence, we're left with a group of several thousand "immortals" constantly cycling through a decade-long period of desperate wealth acquisition.

Enter Dallas Barr, who, as the book opens, is just recovering from his ninth rejuvenation. He's your basic Renaissance man, something like Heinlein's Lazarus Long, except he doesn't give the impression of taking himself very seriously. He's an international figure, one of the most famous and most capable immortals, having made fortunes a total of (I believe) nineteen different ways.

Enter the Steering Committee, a covert committee of immortals eager to "work collectively with [their] wealth and knowledge" to "guide" the world.

While the Stileman Foundation (specifically, its board of wealthy immortals) has monopolized the world economy, forcing medical (and much other) progress to a standstill in order to maintain its plutocracy, the clandestine "Steering Committee" is vying for control of the Stileman Foundation, hence the world. But what is the Steering Committee? How big is it? Who runs it? Unfortunately, you have to join it to find these things out, and those who are offered membership usually either: a) join up and shut up, or; b) don't join up, or join up but refuse to shut up, and wind up not-so-immortal.

And of course Dallas Barr is not "a joiner," so he quickly ends up on the run, along with Maria, his lover from seven decades prior. This, the repeated assassination attempts on Dallas and Maria, and the quest for knowledge of the nature of the Steering Committee by Dallas and Maria, become the meat of the novel. And all of this is exciting, engaging, and fairly realistic, but for a couple of things.

Credibility Problems

Allow Mr. Haldeman his fusion spaceship drive, and he is not very technologically demanding. He doesn't force feed us teleportation or alien intelligence or even robotic butlers. But he does ask us to swallow a few horse pills, beginning with the whole concept of secrecy within the Stileman Foundation. Remarkably, the inherently *secret* parts of the rejuvenation process are divisible one hundred ways; that is, "about a hundred medical people" are sitting on the divers modifications that go into restoring youth. This is hard to swallow. I'm not saying that it's *impossible*, just that some support for this may have been in order. Was there no fundamental principle — or small group of fundamental principles — that localized the key information in a handful of men?

And what of these men? They receive their rejuvenations gratis, in exchange for keeping the secret. Sounds like a good enough offer, I suppose. But biting one's tongue for eight or nine decades *must* get wearisome, and asking this of a hundred intelligent people for almost a century so that a few shrewd businessmen can stay rich and rule the world. . . . well, perhaps it's not the perfect recipe for cooking up a new cabal, but surely it's close.

More horse pills: I was disenchanted by the characters' reactions to the drug "zombie," which occurs late in the book. I can refrain from telling you specifically what the reactions were while still telling you that they seemed almost to be a desperation move by Haldeman. I got the impression that he used his omnipotence to bail them out, and I found that a letdown. I didn't just want them to win, I wanted *them to win it*. Are they not innovative? Are they not dedicated? Can they not persevere?

Now for the Good News

(*Of which there is plenty.*)

Mr. Haldeman is a brilliant *story teller*. That is, one can know of and agree with every above criticism, and still find *Buying Time* engrossing. He is a consummate wordsmith. The prose is flawless, involved, casual, and thoroughly readable. I have nothing but admiration for his ability to turn a phrase, or to turn a book on a phrase, at will.

There is action. Lots of it. Realistic stuff, apportioned thoughtfully to break up and *augment* the heady, cat-and-mouse pontification. The cops-and-robbers stuff is kept to a refreshing minimum, and the monumental screw-ups are divided fairly equally between the good guys and the bad.

He knows how to wield a point of view. The narrative switches smoothly and effectively between Dallas and Maria. The brief third-person spots I found melodramatic and mostly unnecessary, but the brief immersion in the worldview of Eric, an artificial intelligence, I found a delightful novelty.

And then there are the non-narrative inserts, the commercial shorts, advertisements, diagrams, etcetera. These were so clever and effective, I can say nothing with regard to them except *read them for yourself.*

Oversight

On page 159 we see the distance to Ceres given as:

$$D_r = D_o - v_o t + at^2$$

(Where D_r = Remaining distance, D_o = Original distance, and v_o = original velocity)

For our aspiring astrogators out there, the correct formula is:

$$D_r = D_o - v_o t + {}^1/_2 at^2$$

Conclusion

The question, in lieu of all the above, is: Would I give the book to a friend to read?

Yes. The things that annoyed me didn't keep me from enjoying the book overall. And, independent of all the above, I just like Mr. Haldeman's outlook on life. His worldview suits me. He gives some advice, via the semiotic artifice of the criminalistic Peter Quinn, advice that may just outline the general philosophy of both the characters and the writer:

"We can beat the system bit by bit, in our own little spheres, being human with each other. And learning to know the predators when we see them, of course, the ones you can't be human with, and handling them."

Good advice, Mr. Haldeman. Good and poignant advice.

Advertisements And Personals

The Alcor Life Extension Foundation *and* Cryonics *reserve the right to accept, reject, or edit ads at our own discretion, and assume no responsibility for their content or the consequences of answering these advertisements. The rate is $10.00 per line per month (our lines are approximately 90 columns wide). Tip-in rates per sheet are $90 (already printed and folded); or $180 (printed one side) or $270 (printed both sides), from camera-ready copy. Tip-in advertisements must be clearly identified as such.*

I GOOFED. The address of PERIASTRON is PO Box 2365, Sunnyvale, CA 94087. The FIRST ISSUE is out now. Why not write for a trial subscription: any number of issues, up to 24, at $2.50 per issue.

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 OCTOBER meeting will be at the home of:

(SUN, 7 OCT 1990)
Virginia Jacobs
29224 Indian Valley Road
Rolling Hills Estates, CA

Directions: Take the Harbor Freeway (US 110) south to Pacific Coast Highway (State 1) and get off going west. Go along Pacific Coast past the Torrance Municipal Airport to Hawthorne Blvd. Turn left (south) on Hawthorne and go up into the hills past the Peninsula Shopping Center (Silver Spur Rd.). Hawthorne takes a long curve around to the left. Indian Valley Road is a little over two miles beyond the Center, on the left. 29224 is about 0.2 mi up Indian Valley Rd., opposite Firthridge Rd.

***HELP!!* We need more places to meet in the greater LA area!** Specifically and immediately, November 4, for 15-25 people.

The DECEMBER meeting is the Annual Turkey Roast, at the home of:

(SUN, 2 DEC, 1990)
Saul Kent and Jo Ann Martin
16280 Whispering Spur
Riverside, CA

Directions: Take the Riverside Freeway (Hwy 91) east to Riverside and get off going south (right) on Van Buren Blvd. Whispering Spur is south of the freeway four miles, and 1.0 miles beyond Mockingbird Canyon Rd., on the left. 16280 is the second house on the right, at the end of the white fence.

* * *

There is an Alcor chapter in the **San Francisco** Bay area. Its members 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, Arel Lucas, at (408) 978-7616.

The OCTOBER meeting will be held at the home of:

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

Directions: Take the 17 South (880) and get off going east on Camden. Stay on Camden as it turns south and go to Michon Dr. Turn right onto Michon and go to Harwood Rd. Turn left on Harwood and go south to Almaden Rd. (1st street on right). Turn right on Almaden and right again onto Elrose, then left onto Cardel. 1794 is near the end of the street, on the left.

* * *

There two Alcor discussion groups in the Greater New York area. Details may be obtained by calling either:

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

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:

October 20 November 17 December 16 January 19

The ***Long Island Cryonics Discussion Group of Alcor*** meets on the first Saturday of every month, at the home of Gerry Arthus. The address is: 10 Jefferson Blvd.; Port Jefferson Station, L.I., telephone (516) 474-2949.

The meeting dates are as follows:

October 5 November 3 December 2 January 5

* * *

There is a cryonics discussion group in the **Boston** area. Information may be obtained by contacting Eric Klien at (508) 663-5480 (work) or (508) 250-0820 (home). Tentative meeting dates are October 28 and December 30.

Other Events Of Interest

There will be a ***European Cryonics Conference*** October 26-29 at Gatwick Airport (London). This will include a tour of Alcor, U.K.'s new facility. See the April, 1990 issue of *Cryonics* for details and contact Saul Kent at 16280 Whispering Spur; Riverside, CA 92503; USA for additional information.

ALCOR LIFE EXTENSION FOUNDATION
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