

CRYONICS

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Alcor Announces New CEO

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Cryopreservation Case Report: Patient A-2020

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*New CEO and his Wife,
Joe & Sylvia Waynick*



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Coping With Imperfect Preservation

page 8

You & Your Bracelet

page 25

“What is cryotransport?”

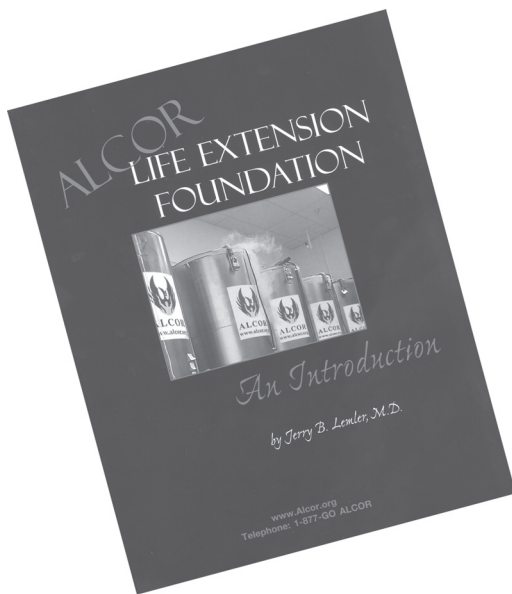
Cryotransport (cryonics) is the ultra-low-temperature preservation (biostasis or cryostasis) of patients who cannot be maintained in a normal, living state by present-day medical practice. The goal is to move these patients into the future (with as little further damage as possible), to a time when cell and tissue repair technology far beyond today’s capabilities are readily available, and where a more comprehensive evaluation of these patients’ chances can be made, where restoration to full function and health may be a realistic possibility. In principle, this is no different from bringing a seriously ill person out of the jungle and to a modern hospital. Applied to cryotransport, the concept is that the only way “out of the jungle” is to travel forward in time. The “modern hospitals” we need can be reached only by traveling decades into the future.

As human knowledge and medical technology continue to expand, people who today are considered hopeless will be easily restored to health. Throughout history, this has been the hallmark of medical progress. Rapidly evolving control of biological and molecular structures promises to soon permit the synthesis of medical devices far smaller than living cells. Through molecular repair, these devices should be able to eliminate virtually all of today’s diseases and allow us to intervene in the aging process, ultimately “curing” and eliminating it. These technologies will also allow us to attempt the repair and recovery of patients waiting in cryostasis. The challenge for us today is to devise techniques that will give these patients the best chances for survival.

“How do I find out more?”

The best source of detailed introductory information about cryotransport is *Alcor Life Extension Foundation: An Introduction* (published December 2001). At 100 pages long, *ALEFI* presents an engaging examination of the social, practical, and scientific arguments that support the continuing refinement of today’s cryotransport techniques in pursuit of a perfected “suspended animation” technology.

ALEFI features chapters on the possibilities in nanomedicine; society’s views of dying throughout the ages; the history of cryonics; the mutability of death; the mechanics of rescue operations, cryonic suspension, and vitrification; the science of molecular engineering; religious and ethical issues surrounding cryonic suspension; key psychological issues faced in the decisionmaking process regarding cryosuspension and advice on how to resolve them; frequently asked questions and answers; and how to join Alcor. Price: \$10.00. Visit our web site at www.alcor.org or contact our Marketing Resource Center at 480-905-1906, ext. 129, to order.



For those considering Alcor Membership. . .

Cryonics is published four times a year by Alcor Life Extension Foundation. The magazine is an important benefit of membership and is mailed to all members. Read about the latest findings from cryonics experts, keep up with happenings at Alcor Central, and learn about special events and conferences in cryonics and related fields.

Alcor’s toll-free number for membership inquiries or donations is: 1-877-GO-ALCOR. For other services, call 1-480-905-1906. For inquiries and member services, contact Membership Administrator Jennifer Chapman at jennifer@alcor.org.

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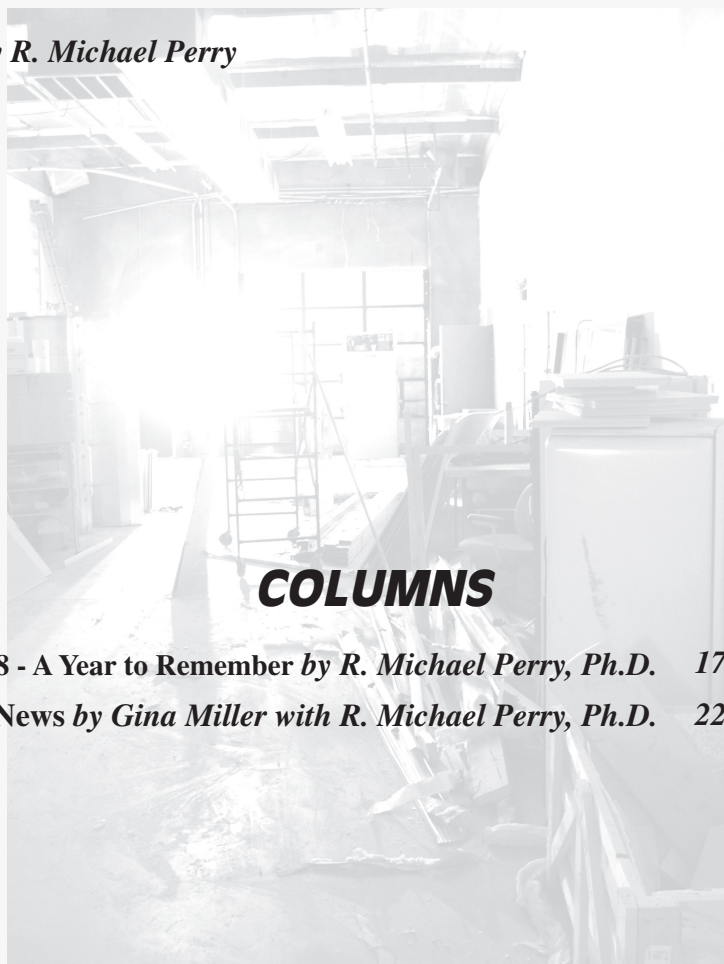


Cover image:
Joe and Sylvia Waynick at the
1997 20-Year Garfield High
School class reunion.

Cryonics

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Alcor: The Origin of Our Name

In September of 1970 Fred and Linda Chamberlain (the founders of Alcor) were asked to come up with a name for a rescue team for the now-defunct Cryonics Society of California (CSC). In view of our logical destiny (the stars), they searched through star catalogs and books on astronomy, hoping to find a star that could serve as a cryonics acronym. *Alcor*, 80 Ursae Majoris, was just what they had been looking for. It not only had some acronymic "fit" for cryonics but was also symbolic for its historical use as a test for eyesight and was located in a very well known constellation.

Alcor, a companion star of Mizar in the Big Dipper's handle, is approximately 5th magnitude, barely within the threshold of human vision. Additionally, it is quite close to Mizar from an angular standpoint, and dimmer. Only with excellent vision can one tell there are two stars rather than just one. For thousands of years, people in the Middle East have used Alcor as a critical test of visual sensitivity and focus. If you could see Alcor, you had excellent vision indeed. In the early days of cryonics, few people could see the need for a rescue team or even for cryonics itself. Symbolically then, Alcor would be a "test" of vision as regards life extension.

As an acronym, Alcor is a close if not perfect fit with *Allopathic Cryogenic Rescue*. The Chamberlains could have forced a five-word string, but these three seemed sufficient. *Allopathy* (as opposed to *Homeopathy*) is a medical perspective wherein *any treatment that improves the prognosis is valid*. *Cryogenic* preservation is the most powerful method known to halt the rapid, entropic disorganization of people following clinical death. *Rescue* differentiates a cryonics approach from

(yet to be developed) proven suspended animation. The acronymic interpretation of Alcor is therefore *use of a cryogenic procedure, though unproven, to preserve structure and potential viability, since failing to do so allows further disorganization to occur and reduces the probability (prognosis) of reversal and reanimation at any future time*.

Some of these thoughts were presented at a CSC dinner meeting in the autumn of 1970. A number of people who have subsequently become members of the Alcor Life Extension Foundation were present at that gathering. Over the months that followed, it became increasingly evident that the leadership of CSC would not support or even tolerate a rescue team concept. Less than one year after the 1970 dinner meeting, the Chamberlains severed all ties with CSC and incorporated the "Rocky Mountain Cryonics Society" in the State of Washington. The articles and bylaws of this organization specifically provided for "Alcor Members," who were to be the core of rescue team activity. Difficulties in securing nonprofit status in Washington then led to reincorporation in California, this time under the name "Alcor Society for Solid State Hypothermia." In the late 1970s, to further broaden the organization's objectives, the present name (Alcor Life Extension Foundation) was adopted.

Despite many transitions, the symbolism of the name remains. How long will it take for more people to see that "Ashes to ashes and dust to dust" is a meaningless destiny... to see that it is possible to reach for a distant tomorrow and perhaps to attain it... to *see* Alcor for what it really is: a vehicle with which to attempt that fantastic voyage!

—Reprinted from *Cryonics*, August 1984.



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Alcor Life Extension Foundation
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How to Join Alcor

Your research is finally complete. You browsed our web site (www.alcor.org), presented your questions to our Membership Administrator (jennifer@alcor.org), and toured our facility. Now you are ready to establish your membership with Alcor Foundation. Congratulations and welcome!

Upon receipt of your application for membership and application fee, Alcor will send you various membership documents (samples available upon request). After reviewing these documents, you will need to execute them in the presence of two signing witnesses. Perhaps a representative of your local bank can notarize the single document that also requires this official witness. After returning all of your documents to Alcor for approval, you can expect to receive one original copy of each for your personal records.

Most people use life insurance to fund their suspension, although cash prepayment is also acceptable. If you do not already have an insurance policy, Alcor recommends that you apply for one at your earliest convenience, as the underwriting process

can last several weeks. Jennifer Chapman, Alcor Membership Administrator, can provide you with a list of insurance agents who have previously written policies for this purpose. These agents can assist you with satisfying Alcor's various funding requirements, such as naming Alcor as the owner and irrevocable beneficiary of your policy and ensuring that your benefit amount is sufficient.

With your membership documents completed and your funding approved by Alcor, you will be issued emergency identification tags engraved with your personal Suspension Number. This is your confirmation that Alcor will provide you with suspension services, should our emergency technicians ever receive a call on your behalf. Certainly, Alcor hopes that you will not need our services anytime soon, but as a member of Alcor you can feel confident that our organization will care for you and your future. Please call 480-905-1906 ext. 113 today to request your application.

TO ALL ALCOR MEMBERS AND THOSE IN THE SIGN-UP PROCESS

Please! Please! Please!

When you move, or change phone numbers (work number as well), change e-mail addresses, or undergo any medical procedure where general anesthesia is used, please inform us as far ahead of time as you can.

Too many times we have tried to contact our members and found out the contact information we have is no longer valid.

Other times we find out well after the fact that a member has undergone a medical procedure with life threatening potential.

*Help us to serve you better!
Keep in touch!*

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ALCOR LIFE EXTENSION FOUNDATION

7895 E. Acoma Dr. #110, Scottsdale, AZ 85260-6916

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Alcor's Mission: The Preservation of Individual Lives



December 13, 2003

From: Michael Riskin; Alcor Chairman of the Board

Re: Alcor announces its new Chief Executive Officer, Joseph A. Waynick

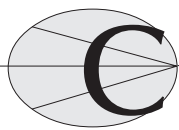
First, on behalf of everyone associated with the mission of cryonics, I wish to once again officially thank Dr. Jerry Lemler for his visionary efforts as Alcor's CEO these past two years. Retiring from this position on December 31, 2003, Jerry will continue to support the foundation as Alcor's Medical Director and chief spokesperson commencing on January 1, 2004.

We all wish you, Jerry, the very best of ongoing successes in whatever you do, but especially in your fight against the life-threatening illness that attacked you earlier this year.

It is also with great pleasure that I am announcing, on behalf of the Board of Directors, the selection of Joseph Waynick, who will be succeeding Dr. Lemler as Alcor's CEO, commencing January 1, 2004. Joe brings a rich and successful career combining business, management, and technology to this position. In addition, he has been elected to the Alcor Board of Directors, effective immediately.

Having gotten to know Joe on a more personal level, I am confident that his leadership will guide Alcor to even greater heights as the world's premier provider of cryonics services.

Michael Riskin



CryoPreservation Case Report:

Patient A-2020

by Tanya Jones

Showing up on our doorstep with no notice, our latest patient came to Scottsdale on October 23, 2003. As a person who joined less than a year ago already afflicted with colon cancer, A-2020 read all of the available literature about how best to set up a transport situation. When the cancer metastasized to his liver, he made the move to Scottsdale. He set himself in an apartment close to the lab, arranged to have it furnished, and actually arrived in the area before calling us.

A family member joined him during his first weekend, and together they set about making certain the appropriate treatment—both medical and cryonic—was in a state of readiness. On extremely short notice, they arranged for an indwelling catheter (dual port, 18 gauge) to be surgically implanted into his left side with firm instructions to leave it in place for our team; and hospice personnel were hired to monitor and maintain the patency of the line, to administer medications and supervision, and to otherwise ensure medical treatment as needed.

He was convinced every single day was to be his last and wanted it to be; but we knew and tried to explain that this would not to be the case. Our patient had been an athlete, and he was well enough to travel on his own; but his belief exacerbated an initial state of high anxiety. Reassurance was not an easy thing to convey, and both hospice personnel and we had our moments of failure. Managing this case was problematic in the beginning, as the advocate, a woman who stayed for only a short time, disrupted the training class at Creekside for Dr. Lemler and myself with phone call after phone call. They made the hospice downright nervous, and served to emphasize the need for redundancy in our own organization. We were compelled to explain several times that the only legal course for hastening an otherwise unavoidable death was to undergo a medically supervised dehydration.

Our patient continued sporadic intake of both food and fluids, which we knew would prolong his decline. As both a precaution against the sudden death risk that particular cancer patients have and to ease his anxiety, we placed transport equipment and supplies into his apartment and replenished ice daily.

Weeks passed, and A-2020 became increasingly disoriented and combative, and we developed concerns that the cancer had spread to his brain. This resulted in his admittance for in-patient

hospice care, under 24-hour supervision, though no additional tests were performed. While in the hospice, his care was challenging for their staff, but they managed him well and still had time to be sensitive to Alcor's needs. By this time, our patient had new representation—another relative—one holding legal authority via power of attorney. Getting to know this advocate was a pleasure for us, as he was a kind person, sensitive to the patient's dignity and willing to discuss Alcor's particular requirements. This advocate's involvement also allowed us to clear up the financial complications caused by a non-standard standby agreement. We'll be conducting a paperwork review that will search for similarly approved agreements, to ensure that no one else has a comparable arrangement.

During all this time, we maintained contact with the nurses, trusting their experience, knowing they would inform us immediately if our patient's condition changed. They assured us they'd call when they estimated a 24 to 48 hour agonal course. This call came early on November 30.

Standby and Transport

The patient was sleeping upon the arrival of the standby team. We'd brought the vehicle that will eventually become our new ambulance, the mobile advanced rescue cart (MARC), medications, and ice. When he later awoke, we found A-2020 still able to speak, but often responding inappropriately. Oxygen saturation levels were still high (92% on first reading), and his pulse was steady. Blood pressure readings were also respectable (120/80), but he had developed a large swelling on the left side of his neck. His level of consciousness had fallen sufficiently and suddenly enough to warrant the hospice contacting us. We settled in a team of two to monitor the situation.

After the first 24 hours, the patient's condition had declined markedly. Saturation levels were consistently below 80%. His pulse was irregular and his apnea worsened, and the swelling on his neck had grown. We added a third member to the standby.

By the next day, his sats had fallen to 65%, tachycardia set in, and he was running a slight temperature. We found the situation curious, as we have rarely seen an agonal patient with peripheral saturation readings so low. Usually the monitor fails as circulation to the extremities shuts down and blood flow is redi-

rected toward vital organs, and our readings were consistently strong. Those suspicions were confirmed when the patient was repositioned in his bed and immediately began sleeping more easily. We discovered the growth on his neck had been contributing to the observed decline. Oxygen saturation levels soon returned to 80% and his pulse steadied. But though his comfort improved for a time, we were now 24 hours from pronouncement. When pronouncement came (December 3, 11:40 am), we had the requisite four team members on-site to launch the transport.

Pronouncement was prompt, and we quickly implemented the transport protocol. Putting the patient into the ice bath, the cooling helmet in place, and activating the MARC's water circulation system all occurred within the next four minutes. (Circulating ice water over a surface cools slightly faster than ice alone.) Manual cardiopulmonary support was initiated using an Ambu Cardiopump, and the patient was intubated to facilitate direct oxygenation. We began injecting transport medications to stabilize the cells against ischemic insult. His initial nasopharyngeal temperature was 33.6°C.

Twenty-five minutes later, we'd done all we could in the patient's room. Only one problem had manifested: one of the new medications in the protocol was too viscous to administer through the small-gauge IV ports. We set those aside, connected the larger-volume medications, and secured the patient for transport. Once in the vehicle, the automated LUCAS device replaced the Ambu Cardiopump as the means to applying chest compressions. One team member replaced the oxygen saturation meter, and discovered that oxygen levels reached at least 83% during transport.

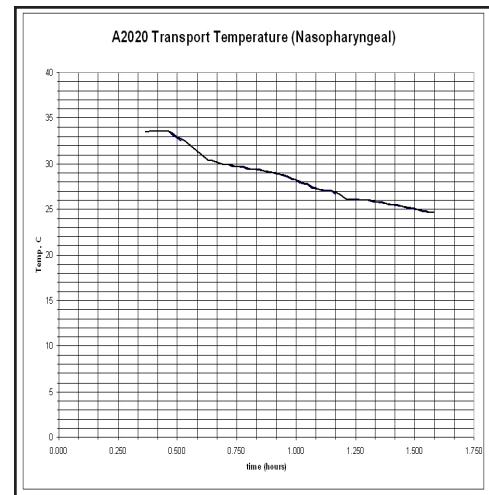
Also of note with the LUCAS is that it did not require a separate respirator. At the base of the plunger is a suction cup, and as the saturation levels attested, this was effective as a means for getting air into the lungs. Now that this device is approved for use in the United States, we will be looking to deploy it as standard transport equipment.

Shortly after his arrival at the facility, the viscous transport medication had warmed sufficiently to be administered. Chest compressions continued until 12:43 pm. None of the large volume medications were delivered in full as the preparations moved forward too quickly. External water circulation was shut off moments after the chest compressions, and the patient was moved to the operating table.

Cryopreservation

Our surgeon arrived quickly, and the patient was prepped. Burr holes were completed first. Use of a new cranial perforator accelerated this part of the procedure, and both holes were complete by 13:04. By this time, the patient's nasopharyngeal temperature had dropped nearly ten degrees to 25.1°C.

After repositioning and prepping the patient for the next incisions, the ventricular cutdown began on the right at 13:17. Transport temperature monitoring was discontinued at the start of the cutdown, with the patient's nasopharyngeal temperature



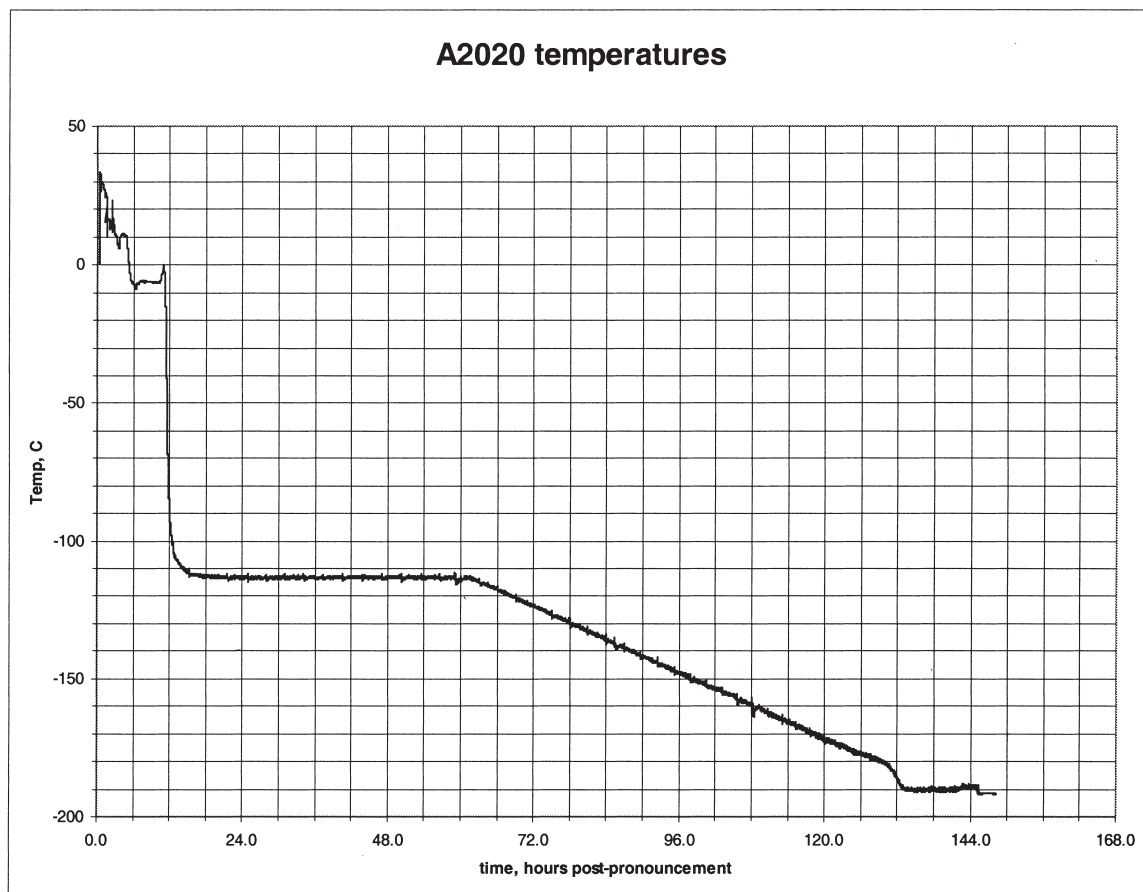
having reached 21°C. Isolation of the right carotid artery and jugular vein was completed in 12 minutes. The left jugular proved more elusive, and the attempt to isolate it continued until 13:49 at which point the decision was made to bypass that step since jugular cannulation was not essential to successful cryopreservation; we also assumed its location would become apparent once the washout started and we could trace the effluent.

Cephalic isolation was carried out and the head transferred to the cooling chamber by 14:00. Arterial and venous cannulation commenced, and the blood washout began at 14:08. No clots were observed exiting the patient's circulatory system, and the color of the effluent lightened appropriately. The vessels exposed by the burr holes provided visual evidence that our solutions were passing through the circulatory system. Temperature probes and crackphone elements were then secured, and the first perfusate samples were taken at 14:39. Washout proceeded quickly and without incident. The circuit was closed and cryoprotection started at 14:54.

Current protocols require a graduated introduction of higher levels of cryoprotectant, and it takes significantly longer than past protocols. As cryoprotectant is introduced, it is allowed to circulate and given time to equilibrate at 50% before maximum concentrations are introduced. The first samples were analyzed for cryoprotectant uptake at 15:25, and yielded readings of 23.0 and 24.7 brix (3.45 M and 3.70 M respectively). An hour later, those concentrations had climbed to 30.3 and 30.8 brix (4.55 M and 4.62 M). Cryoprotection continued until 22:19, at which point final samples were taken and perfusion discontinued.

Equilibration typically takes about 30 minutes, and this one took longer. We had concerns about lateralization, since we'd been unable to locate the left jugular vein. We also observed the right hemisphere receding faster than the left. As a result the pause stage in the middle of the cryoprotection was given more time, just to ensure that we'd given the tissues in both hemispheres time to take up the chemicals.

Correcting an error in *Alcor News*, the complete cryoprotection took 10.65 hours post-pronouncement (not the



5.5 previously reported). The error in data documentation that led to release of false information has been corrected.

Temperature Descent

Cooling the patient proceeded largely according to protocol. Cooling to -110°C was prompt. The next stages took somewhat longer than typical as the result of too many staff members being incapacitated with the flu, but at those temperatures, the damage was minimal.

Five cracking events were recorded. The first occurred at a temperature significantly lower than we'd seen before (-134°C), and may be a reflection of the quality of the transport and cryoprotection. The total number of cracking events was also much reduced (normal range: 20–30 incidents).

Conclusion

We've already discussed the medication viscosity issue and are revising the protocol to reflect necessary modifications. Operating room organization will be improved, since there were several things not in place when the patient arrived. Training protocols need to expand to include prep, though this is more a refinement of existing procedures than implementation of new ones. Overall, this case went fairly well, and it certainly went more smoothly after pronouncement than we could have hoped when the situation first escalated.

Preliminary data seems to indicate this cryopreservation itself went particularly well. We're awaiting the results from additional sample testing, but the patient appears to have achieved the necessary cryoprotectant concentrations to vitrify. We still need to carry out additional research into the specifics of our procedures to improve our understanding of the dynamics, but that will take time. In the meantime, a new format is being developed for data representation, one that we expect will prove useful in comparing individual cases and our various protocols directly. We'll keep you posted.



COPING WITH IMPERFECT PRESERVATION

By Mike Perry

An earlier version of this article appeared in The Alcor Phoenix, June 1995.



Imperfect preservation is arguably the most serious and difficult problem we must confront in cryonics, not excepting the various challenges we could face from our opponents in the world at large. It is a philosophical as well as a scientific and technological problem. We cannot fully address it yet, nor shall we be able to for some time, but the issues connected with imperfect preservation are too important to ignore.

At best, all biological preservation is presently imperfect; cryostasis is no exception. Even though dramatic improvements in our protocols appear to have been achieved in recent years, we are still some distance away from demonstrated, reversible suspended animation. Until that point arrives, it may require such yet-to-be-developed means as a mature nanotechnology to restore our patients to a functioning state. This in turn is only part of the problem, the other, possibly more serious part being the condition of the patient prior to cryopreservation in the first place. Even a perfect preservation would, if performed under today's legally allowable conditions and then simply reversed, leave us with a patient in no better shape than just past the point of clinical death, with medical problems needing heroic treatment, and fast!

In the future, if our methods are brought to perfection or laws change for other reasons, it may be possible to initiate preservation when the patient is in much better shape both physically and mentally, so that reactivation can proceed more straightforwardly when means of treating the still-serious medical problems are available. (Henceforth I will use *reactivation* as a catchall for any of possibly many ways and varieties of restoring the patient to functionality, using whatever technological means may be developed in the future and found suitable.) For now, though, we must confront the fact that many of our patients are mentally impaired at the time of preservation. Prospects are unknown for inferring identity-critical brain structure and restoring full functionality with memories intact, even if advanced methods of the future are presumed.

On the plus side, we do expect that a great deal of damage of a certain sort can be sustained without significant loss of the necessary structural information. DNA might be used to recreate the entire body minus the brain, for example, and much of the brain's information seems redundantly encoded so that it might be inferred even after substantial injury. When there is enough information to restore the healthy state, the problem of reactivation

should be easy to deal with in principle. That is not the main focus of this article.

Instead I will consider the other cases, where some significant, irretrievable loss of identity-critical information has occurred. These I will call Information Deficient (ID) cases. For these it is less clear what ought to be done, even in principle. Opinions will vary; definitive answers are not to be expected. Here I offer some of my opinions, recognizing that much of what I say is speculative and that not everyone will agree. I'll try to cover several points of view, though naturally with emphasis on what personally seems most significant and relevant.

One issue that arises at the start is that there are different views on what would constitute reactivation and survival. For some, original material—the body or at least the brain or some crucial component of the brain—must be restored to a functioning state: what “you” really are is dependent on a specific physical object or “token.” Others would impose less stringent requirements—a duplicate of the original would suffice, or even an upload in which the personality is reduced to a body of information, then transferred and “run” on an advanced information-processing device. In this case the token is not of primary significance but only the information or pattern. Whether one is a tokenist or patternist—or something in-between or otherwise entirely—will affect one's judgment about the efficacy of a proposed reactivation. As it happens I take the patternist view, and see the problem of reactivation as by and large one of information retrieval and/or re-creation. Once the necessary information is available, the rest, reinstating the person in some physical and functioning form, should be relatively straightforward and unremarkable. This assumes, of course, that advanced technology of the future is available to carry out what would be needed—a general-purpose nanotechnological assembler should be adequate, and possibly devices of much less capability; such devices seem consistent with physics as we know it. For patternists the result, a construct which can be considered to embody or instantiate the very person we would like to reactivate, need only exhibit sufficient similarity to the original to qualify. Tokenists will object and ask for more but may also see value in what has been accomplished, particularly if it is the best that could be done.

So, proceeding with the assumption that the information or pattern is what is really important, I will also assume that some information about the past cannot be retrievable, a viewpoint

that seems well supported by modern physics. Otherwise there would be no ID cases to worry about, even if no part of the patient remained! I'll start by outlining some reasons why we should be concerned about the ID cases now.

First, to summarize and elaborate the concerns raised above, it is possible that very many cryopreserved cases are ID, not excepting some recent cases where advanced protocols were used but the patients had substantial brain injury at the time of preservation. This situation could continue for some time to come, and could also occur unexpectedly, as in the case of fatal accidents, or a period of warm ischemia following clinical death. The latter is especially common with last-minute cases, but clearly we are all at risk. That rather unsettling thought means, for instance, that we should not overlook other ways of storing information about ourselves besides cryopreservation, such as videotapes, diaries, and other memorabilia.

Second, it never hurts to start thinking about the tough questions early, even if there is much that cannot be done yet. This could have repercussions in such matters as how cryonics is presented and how it is perceived by those we'd like to get signed up, as well as orienting us to take advantage of new technologies and methods when they do come along.

Third, there are choices that will have to be made in ID reactivations that we, the potential patients, should start thinking about. If our memories were partly or wholly erased, for instance, would we want to be reactivated amnesiac, or have some memories "reinvented"?

Fourth, cryonics is only one possible means to the end of preserving a person's remains for possible reactivation. Confronting imperfect preservation in cryonics will make it easier for us to consider alternatives such as chemical fixation, where the preservation might be even more imperfect but still not negligible.

Finally, confronting the ID cases raises fundamental issues about the nature of personality and survival that ought to be addressed: for instance, what do we accomplish if we do preserve a given chunk of information about ourselves, and why is that better than just losing the information?

Let us now consider a reactivation scenario for a seriously ID case. It is often said, "the worst thing you'll suffer is some amnesia." Certainly that is reasonable, at least if an intact copy of the genome can be recovered. (For reasons of brevity I'll mainly consider the DNA-recoverable cases here; these are nearly universal in cryonics, though the principal arguments will apply more generally.) With the DNA it should be possible to repair or replace every organ of the body; only memories or other nongenetic information acquired in the course of life cannot be reinstated this way. Even in the more extreme cases, though, clearly we'd not be limited to a person with just the information that can be deduced from the biological remains.

Suppose the brain is entirely missing: all we have is a cell sample. It is sometimes assumed that the best that can be done then is to create an infant, identical twin of the original, who would then have to grow up all over again. Not so, I submit, far from it. A great deal should be inferable about the original per-

son from other sources. We should know: her name, what native language she spoke, and probably much about her various talents, interests, preferences, where she lived, visited, attended school, and what subjects were studied; plus information about friends, loved ones, and acquaintances. We could create someone who, as far as anyone could tell, was the original person down to the smallest detail, and who was fully convinced of this herself. To do so, however, would require inventing some details, and particularly the sort of important details, such as memories, that would be most vulnerable to loss through destruction of the original brain structure.

At this point we have entered a realm of controversy, where opinions will vary as to the "authenticity" of the reactivation as well as the propriety of carrying it out. Some might favor including only details we could be sure about. However, this could result in someone with obvious defects and also major unhappiness, in addition to being an unnatural and improbable reconstruction. On the other hand, if the missing details were to be filled in by imaginative guesswork, many would view the result as a historical fantasy, possibly much like the original, but certainly not the same person, nor any real person who ever lived. So what is to be done?

One important factor, certainly, would be the wishes of the patient in question. It may be that these were spelled out in detail, so that it is clear what desired course was to be followed. Thus, in a hypothetical scenario, perhaps the patient (an adult we'll assume) died in a plane crash, but after first leaving behind a DNA sample. Perhaps the instruction for this contingency was simply to create an infant from the DNA and raise that person to maturity—or perhaps it was something more challenging. In any case, if the instructions are clear, the future choice may be much clearer too, and people accordingly should be encouraged to express their preferences. But we must also keep in mind that future wisdom may dictate other procedures or policies than what were naively requested, particularly in more difficult cases. Rather than narrowly attempting to micromanage one's reactivation, then, it is probably better to focus on providing pertinent information. Videos, diaries, and other personal memorabilia will both serve as backups in case one's remains are compromised, as we have noted, and also can indicate preferences.

I'd now like to look in more detail at the problem of authenticity in reactivations. Here we enter a still more speculative realm, where far-ranging scientific issues become important.

It might seem that, if a person were reactivated from incomplete remains, so that filling in of details by guesswork became necessary, the result must be an unhistorical fantasy, a person who never really lived. This is based on the world view that history has a single, authentic timeline, and that information about what happened can be lost so that purported information about the past can be false, but not verifiably so. (Actually, even in this case there is a small chance that all the billions of bits we would expect to have to guess could be correctly arrived at by accident, but this likelihood is so small I'm ignoring it.) On this basis, then, it becomes impossible to reactivate the original person in

the ID cases. Some subscribers to this viewpoint, however, may still have interest in a person much like themselves returning to consciousness, and will express their wishes accordingly.

But there is another possibility, which is that history does not have a unique timeline, but that alternate histories are unfolding in parallel, though almost all of this plural effusion is hidden from our observation. This in particular is the viewpoint of the many-worlds formulation of quantum mechanics, which in addition argues that each single, historical timeline is continually splitting into multiples. This means that any observer is constantly dividing into copies, each of which then acquires a separate consciousness and pursues a separate existence. In fact, essentially every possible history is unfolding somewhere. (The overall creative explosion arguably dwarfs anything yet imagined about supernatural powers!) Timelines also can fuse, when the information necessary to distinguish them is erased, so that loss of information can be said to make the past ambiguous.

The metaphysical claims of many-worlds have left many physicists more than a little skeptical. Yet there is interesting evidence for this strange and wonderful theory, which is simpler in some ways than its rivals. Its logic seems compelling to some thoughtful and knowledgeable scientists and acceptance seems to be growing. In particular, cosmologists, who study physics on the deepest and most far-reaching levels, generally favor many-worlds. (Though it is not yet possible to distinguish, experimentally, between many-worlds and some rival theories, there are ways in principle that distinguishing tests could be carried out; hopefully this will happen when our technology is more advanced.)

If true, many-worlds would have profound consequences at a deep level of reality, and a major impact for the issues considered here. In particular, the outlook for an ID case becomes immediately more hopeful. Assume, for instance, that an attempt will be made to produce the best possible reconstruction of that person, using educated guesswork where necessary, and suppose that it does produce a functioning person who resembles the original in all known details. We'll also assume, as usual, that many details had to be filled in by guesswork, so that our reconstruction is—by conventional intuition—unlikely to be identical to the (seemingly) single original that once existed.

This does not mean that this one original is not reactivated, because at this point parallelism comes into play. In keeping with many-worlds, any historical process is flanked by many similar processes, which together fill out a vast space of possibilities. In our hypothetical case, then, there would be not just one reactivation attempt but very many in parallel, carried out by near copies of ourselves in near copies of our world. Somewhere, among all the ongoing reactivations, there would be those that, however unlikely, just happened to create exact copies of our original. This person, then, could continue his/her existence in much the same way as other people, who under many-worlds are constantly splitting into copies anyway. Conversely, the inexact copies, produced in other parallel worlds, would be exact copies of other persons who had really lived, in other, parallel histories. Every

attempted ID reactivation, then, if it produced a person that, as far as one could tell, was authentic, would in fact be authentic, though from a past that was not uniquely tied to our present.

An additional point worth making is that an individual does not belong uniquely to any one of the parallel worlds, but, in the form of identical (or sufficiently close) copies, is simultaneously present in all the differing timelines whose histories agree with his/her own memories. (The interchangeable copies can thus be regarded as “instantiations” together comprising only a single individual, this being consistent with, and actually a necessary consequence of, the patternist position.) The reactivated individual, then, never ends up in the “wrong” universe, but was actually present before, so long as consistency is maintained between the memories and the external, historical record.

Many-worlds, then, appears to yield a hopeful scenario even when substantial information is not preserved. Other theories involving multiple universes, that is to say, a multiverse, and many copies and near-copies of every individual, could, with some adjustments, also allow for similar scenarios. One can even make the argument that, given that conditions seem to have to be very special for intelligent life to appear, there must be *some* proliferation of this sort to account for our presence here. This subject is treated at greater length in my book, *Forever for All*.¹

But the issue will then be raised of why preserve one's information in the first place, if it is not necessary for an eventual “coming back” in some form. I think there are good reasons to opt for preservation, even though the arguments take on a certain subtlety. (And extreme situations could call for the noble sacrifice of one's chances of preservation—but this interesting, tangential subject will have to be deferred.) A case for the preservation option can be summarized as follows.

A major consideration is simply coping with the unknown. What may follow our clinical death cannot be predicted with confidence, but preservation should offer a better means of coping, reducing the extent of the unknown. Without well-preserved remains the task of reactivation, which may be hard enough in any case, could burgeon to planetary proportions, even with future, far-advanced capabilities. As a preliminary, a sizable portion of the inferable history of the earth extending back to before one's birth may have to be recovered, analyzing all relevant materials down to the molecular level, merely to ensure that one's reactivation will, in fact, be consistent with this history. By a reasonable refinement, mutual consistencies with contemporaries and other reactivated IDs will need to be established, which will further complicate matters. It is hard to say how long such operations may take or what features they may assume, but we can imagine armies of archaeological, nanoscopic robots working on and in the earth's crust for decades, centuries, millennia—who knows?—assisted by tidal waves of computation. The difficulties of these and other necessary steps will probably be “passed on to the consumer”—the patient—in one way or another, including the dislocation and disorientation caused by one's reappearance in strange circumstances and possibly a distant future. Efforts will no doubt be made to “smooth the path” and

make the whole enterprise bearable and even enjoyable, but at least some significant hardship and adverse reaction can be expected.

A word should be said about those who would carry out or supervise the anticipated reactivations. I am assuming, of course, that advanced, benevolent former humans or other beings will eventually appear who willingly undertake all the necessary, technology-assisted labors, which might develop into a project of scope and duration well beyond even the levels suggested above. (Concern would naturally extend to all other persons of the historical past, and more generally to sentient life-forms which have made their appearance at one point or another since remote prehistoric times.) I think it is a reasonable assumption, all things considered, that benign reactivators will actually emerge and engage themselves as I have suggested, assuming civilization endures—though admittedly this is not self-evident. (Actually I would like to be among their number myself someday.) Yet the reactivators too must have their motives, which will probably accord with their refined notions of enlightened self-interest, and may involve some deliberately induced hardships for the ultimate benefit of those reactivated. Preservation, by comparison, should bypass much of this whole problem. If nothing else, those who choose it should need less in the way of “parenting” from their rescuers. These in turn should be much closer to comrades and peers of the patients they are helping, and should bring them into a world less removed in time and circumstance, and more like the one from which they departed.

Additional arguments suggest ways that both oneself and others will benefit through one’s preservation. We just noted that the well-preserved should come back sooner with less in the way of difficult adjustments. They might relatively soon join their rescuers and others and advance along with the new civilization of the newly-enduring. So there should be an increased facility for meaningful interaction with fellow beings, which should translate to a better, more meaningful life all around. This could be significant in ways hard to appreciate today. The sort of enduring entities we presently transient humans hope to become would arguably have highly refined survival instincts. Historical ties would then assume a deeper significance than is possible now. Preservation, it should be noted, will prevent a loss that would not be fully reversed even if the same person is recreated by guesswork, since that person’s role as a defining element of recorded history will have been irreparably compromised. History that is recreated must retain an ersatz character that will sharply distinguish it from the recorded, recovered variety, even though it too is “real,” in a suitable sense, given the multiverse ontology. At the human level, even now it can be seen that the remains, particularly the brain, are a kind of diary whose contents arguably ought to be saved and transmitted to posterity. Of course, here we are not simply trying to preserve historical data but even more important, to save and extend a person’s life. (And it is also worth noting that the brain stores information about other people, including those who will not be preserved themselves, and thus could benefit these others by strengthening their own

historical ties.)

There is one additional way that the well-preserved should benefit, that is not so hard to understand for us humans today. It involves the issue of status, and it hinges on the earlier start that, as we noted, should be open to those whose reactivation will be the simplest. With this head start they should gain a position of rank and privilege long and well surpassing those who must be reactivated by a slow and laborious alternative. Every privilege carries a responsibility, as the old saying goes, so this must be approached with gravity—yet it is something to think about.

Finally, a moral argument can be invoked to link the other arguments together and remind us that we must bear responsibility for our choices on life-and-death issues. The upshot: though reactivation could happen without prior preservation, it would place the recipient at a disadvantage that he or she, along with others, would come to recognize as such.

Once we accept the idea that preservation for one’s eventual reactivation is a good thing, we can plausibly extend this to conclude that, if some identity-critical material must be lost, it is better to lose less than more. (Actually some argument is called for, but the case can be made that those who are more mildly ID could be brought back much sooner than the more compromised, with the fill-in of missing details, relatively minor but still significant, possibly deferred to a later date.) If forced to choose an imperfect preservation, then, we still want to choose as well as possible. Even a cell sample should be better than no DNA, burial should be better than cremation, a first-rate chemical fixation better than more conventional embalming, and so on.

But best of all is preservation that is adequate, so that no information must be conjured by guesswork to avoid a compromising amnesia or worse. This is what we must seek, while not losing hope for the more difficult cases.



I. R. Michael Perry, *Forever for All*, Parkland, FL.: Universal Publishers, 2000; see esp. chapter 6.



postscript

A Few Parting Words

by Jerry B. Lemler, M.D.

Since this is my last report to you as President of the Alcor Life Extension Foundation (I will continue on as Medical Director), I feel a retrospective review is somewhat appropriate. In order to particularly understand the disappointments I leave office holding onto, you must remember that I was one of those so-called “quick converters,” who instantaneously saw the value of cryonics. I was a practicing psychiatrist in east Tennessee when in February of 2000, I wandered into a bookstore and happened to pull off the shelf Dr. Eric Drexler’s *Engines of Creation*. Two days later my entire life changed, and for the life of me I still can’t see why anybody else wouldn’t be interested in the possibilities that Drexler and others before and since him have elucidated for us. In fact, this has been a source of great consternation for me as I have gone around the country the last three years soliciting memberships and interest in the organization. What I generally find is that people are fascinated by us, interested in us, they ask a lot of both silly and earnest questions regarding what we do, but in the end a scant few will request membership packages and a only a small proportion of them will even bother to become members. When I started at Alcor back in February 2001, our growth rate was approximately 8% per year. Currently we are at 10% per year. Yes, this is an improvement, no doubt, but it wasn’t the kind of improvement I was hoping for or, quite frankly, even expecting.

One of the first complaints from the membership I heard when I came to Alcor nearly three years ago was that the foundation seemed most unwilling to contact members and generate interest in a social sense as well as a scientific sense. Some of the steps I took to change that situation began with the immediate removal of the old phone system. (You had to listen to endless repetitions of a menu that led you nowhere, and you never did get to speak to the person you were trying to reach.) It was virtually impossible (aside from the emergency line, of course), to engage in a conversation with any Alcor staff member. One of my very first moves, additionally, was to work to guarantee that our UK members would no longer have to have an American insurance policy and that we would accept relatives of our overseas members, their friends, etc., so that they could return to the Alcor fold. We had already lost several Alcor members and the Eastborne facility from, quite frankly, some misguided managerial decisions.

All said, I think my greatest contribution to Alcor has been an opening up of the foundation as it has never been opened up before. I launched Project Future Bound in the spring of 2001, in an effort (after a long conversation I had with Bill Faloony before I took the job back in November of 2000) to professionalize our rescue network. I felt it was imperative that while the ACT network was a most worthwhile group, these individuals had lives of their own and their priorities would always be split, no matter when we called on them. It was also difficult to get them to Arizona or other local training facilities to keep their training current. And, when you realize you don’t do suspensions but maybe three to eight times per year and they are located all over the country, the need for paramedic-type first responders becomes most evident. Project Future Bound reached its limits with our southern California permanent rescue unit, which is now our bright and shining

star, a system that has improved significantly over the last three years.

I was very much involved in the outreach program to stir up interest and try to increase membership. I had the pleasure of visiting with people in their homes in Wilmington, Delaware; San Jose, California; Orlando, Florida; Los Angeles, California; Tucson, Arizona; and even in my hospital room at the MD Anderson Hospital in Houston, Texas. I was able to forge alliances with our formerly disaffected California friends and research companies. This began with the formation of an Alcor Advisory Committee to make recommendations for the improvement of Alcor, some of which has been accomplished already. Regrettably, however, I must admit that I was very disappointed with the fact that three separate individuals, all who had shown promise in becoming our Cryotransport Manager, left their positions in fairly short order. There is no doubt about the fact that this did hamper our ability to meet the Advisory Committee's recommendations in a timely fashion. At least now I finally have confidence we are well-represented by our current Chief Operating Officer, Tanya Jones, who has rejoined the Alcor staff and will direct our transport services. Welcome back, Tanya! Another disappointment that I must confess to you is my inability to get more women interested in cryonics. I knew the gender discrepancy among members before I arrived, but I really thought I could make an impact, especially with my psychiatrist degree. However, I must admit to you today (even without looking at the official record) that I have seen no massive movement in either direction, and certainly no significant movement in the distaff sector.

We were able to get into some hopeful and much needed research by hiring research associate Todd Huffman. We have begun work on something of immense importance to many of our members—intermediate temperature storage. There has always been a hearty debate amongst the two camps who do and do not wish to have this as an alternative. However, since there is enough interest to research the practicality of offering intermediate temperature storage, Alcor feels that it is essential that we at last investigate whether having a menu of these services on hand would be beneficial as well as practical.

Certainly, one of my better decisions early on was to create the so-called "Open Option Plan." At the time, we did not have any medical personnel on board, so this enabled our members to not only fund at a higher level (i.e., whole body) but also defer the decision until the time of their suspension (given so many variables, the senior medical staff at Alcor would determine which method of suspension would be the best in view of what the patient had requested). The Open Option Plan has proven to be a tremendous success in providing versatility and flexibility in the Alcor protocol.

The Cryosummit was held in August of 2002 as a result of my initiative. It was good to meet with people I had only talked to by phone or by e-mail. Many subjects were discussed at the Cryosummit, and I hope one day there will be a big enough umbrella for us all to shelter under. I don't, quite frankly, foresee this happening any time in the immediate future. We are just too

different in how we operate, view the future, and, most important, how we see getting to that future.

I was very proud of our Newport Beach Conference of 2002. Great thanks go to Ralph Merkle, who was tireless in his efforts to put together this amazing symposium. While not a financial success (as we had dreamed), the value resided in gathering so many first-rate scientists from around the globe (including, arguably, the world's leading anti-aging research coordinator, Dr. Aubrey deGrey). Alcor's path to the future clearly rests with research. Since there are so few of us (cryonicists), Alcor must share the burden of at least performing some of it or (in addition) funding it. Make no mistake about it, in my opinion, the primary objective is the establishment of a viable whole-body vitrification system.

I have enjoyed giving so many tours and interviews and meeting with college classes on a regular basis. I was also very proud of writing *The Alcor Life Extension Foundation: An Introduction*, back in late 2000, and this book still serves as a focal point of our introductory packet. Quite frankly, though, it's getting a bit dated. *CRFT (Cryonics: Reaching for Tomorrow)*—its predecessor—lasted eight years! It was at that point I realized I thought I could bring it up to date, give it a fresh look, etc., and I was given permission to do so by Linda Chamberlain. Now, I'm admitting we need to spruce up what we've got, and I would suggest a greater scientific "feel" for the next revision to whom-ever writes it.

The building project is, once again, on schedule. Most recently, Cindy Felix has been quite busy in making sure that everything stays on time and doesn't go more over budget than necessary. When completed, as you may recall, we will have two operating theaters instead of one, and we will be able to double the volume of patients in our Patient Care Bay from 75 to 150. This building project has been a long-needed addition to our facility in Scottsdale.

I did meet two members who were particularly significant to me. At the Asilomar Conference where Paula and I had just become members ten days previously, we met a man who wasn't traveling with anyone, sitting alone, and just looked like he needed someone to talk to. So, we did. The man turned out to be Richard "Dick" Allen Bergren. I was glad we spent much of Asilomar with Dick. He was quite a fellow, had many interesting stories to tell, was an avid cryonicist, and a nice man in every way. Unfortunately, even at the time of our meeting he had cancer, and he indicated that he really did not have that much longer to live. Sadly, this diagnosis and prognosis were most accurate, and he and I started a dialogue in February 2001 when I first arrived that continued all the way through his suspension in late March of that same year. I met Dick at the airport (along with Hugh Hixon), and we drove him to the hospice and spent much time with him up until the time of his demise. He was a remarkable man, and I will miss him very much. The second individual was a personal friend of great ebullience and intelligence. He just seemed to light up a room, although even in these pages I have called him what can best be described as a nebbish. I still very

often tell of how Leonard Zubkoff would just plop himself down in my office, sitting in a chair (my desk between us both), and even if I was doing something (talking on the telephone, dictating, or whatever), he'd just sit there. The man would not leave until I had addressed his issue. At first, I found this behavior rather annoying, and even said so. It did not phase him in the least. Leonard Zubkoff was one of a kind. We eventually became extremely good friends and enjoyed each other's company until his tragic death in Alaska in late August of 2002, due to a helicopter crash. Oh, how I wish I could just one more time see Leonard park himself in front of me, staring me in the eye.

The absolute highlight of my three years with Alcor was my trip to England in late September to speak before the Tenth Congress of the International Association of Biomedical Gerontology, where I delivered a paper on how cryonics can serve as a bridge to a time when we live in a world that can engineer negligible senescence. My talk was well received without a single defamatory remark or silly question or even a challenge from the audience. This paper will be included in the Annals of the New York Academy of Sciences sometime in the next (I am told) four to five months. Please look for it, as this will be the first scientific paper on cryonics in a legitimate scientific journal by an Alcor author in probably more than a decade.

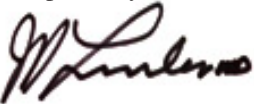
Finally, on a personal note, I have been battling Burkett's Lymphoma since I was told by my (former) personal physician (who erroneously diagnosed my clinical symptoms *and* radiologic findings) that I needed to "go home and make peace with myself" on April 11 of this year.

This tumor had actually started four weeks earlier, and, I am told, at its greatest length, measured 27 cm. Thanks to some good friends and benefactors, I was able to go to the marvelous M. D. Anderson Cancer Center (where Alcor had performed a case just shortly before) and receive the accurate diagnosis that I did, along with a much improved prognosis. I am now in complete remission, and while this is not a cure, it is much better (at least right now) than making peace.

Thanks to all of you who have supported my administration, Alcor Staff, Alcor Board, Alcor Advisors, Scientific Advisory Board, Medical Advisory Board, and last but certainly not least, our Patient Care Trust Board.

I wish the best to our new CEO, and I stand ready to assist in any way to further our cause. We truly have a noble one, and I feel no less energized by this fact than I did on the first day I arrived.

Respectfully Submitted,



Jerry B. Lemler, MD
President/CEO/Medical Advisor
Alcor Life Extension Foundation
December 2003

NEW PROCEDURES

It has long been known that completing Alcor's paperwork can be a daunting task. The amount of required paperwork was recently considered at a Board Meeting, during which the Directors addressed the legal and practical reasons for having multiple originals. There is no legal reason for having more than one original, and it was agreed that a duplicate will suffice when representing a member in the hospital. Most prominently, requiring only one original will be tremendously easier for those in the sign-up process, as well as Alcor members who want to make paperwork updates. With these considerations in mind, it was resolved that Alcor will now require submission of one original contract. Clients will still be given the option of completing additional originals, and in all cases the original and a duplicate will be kept with Alcor's records.

Since January 2003 Alcor's \$100 application fee has been waived. In the absence of a notable increase in the number of applications being processed, an application fee will again be applied effective January 1, 2004. The new rate will be \$150 for the first family member who applies. If one or more additional family members want to join an additional \$50 payment will be collected. In total, an entire family can join for \$200, making family memberships much more affordable while sustaining this source of income for the organization.

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update

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CEO Report

by Joseph A. Waynick

C

It is with great pleasure that I address the Alcor membership in my first report in *Cryonics* magazine. My association with Alcor dates back to 1993 when I learned of the organization during a cross-country flight by reading an article written by Charles Platt in *Omni* magazine, which happened to be in the seat pocket in front of me.

I had been fascinated with the idea of longevity and suspended animation since my early teenage years and I was astonished and elated to discover that there was an organization that actually practiced the science of cryonics.

Upon returning to California I contacted Alcor and subscribed to the magazine. I also started attending the monthly board meetings, and thus began my serious study of this fascinating science. Never did I imagine that I would one day lead this organization. It is an awesome responsibility and my commitment to Alcor, our members, and especially our patients is that I will do my very best to advance the science of cryonics, improve our capability to perform cryopreservations, and to protect the lives of our patients.

As usual, Alcor faces many challenges in the coming year. We have initiated many new projects to streamline our operation, improve our finances, upgrade our cryopreservation capability, and enhance long-term patient care.

Our readiness to perform cryopreservations will be significantly enhanced over the coming months through a series of initiatives lead by Tanya Jones. The scope of responsibilities for our readiness coordinator, Mathew Sullivan have been focused to allow him to spend more time preparing kits, implementing a new med expiration protocol, and training a suitable backup. Tanya is also formulating a formal strategy to better support our Regional Coordinators as well as developing a transport team member certification program to increase the skill sets of standby and cryopreservation participants. Higher temperature storage and whole body vitrification continue to remain as major initiatives as well. More detailed reporting on these two ongoing projects will appear in *Alcor News*.

Long-term patient care will take a big step forward as Cindy Felix completes overseeing the construction of the new Patient Care Bay. Hugh Hixon and Mike Perry will be working on enhancements to the big foot dewers to provide more automated monitoring of LN₂ levels, backed up with failsafe alarms and manual overrides for reliability. In addition, they are reviving a previous project that will improve the efficiency of our bulk transfer by installing automatic shutoff valves on each dewer to regulate the refill process. These steps will give us the ability to more precisely maintain LN₂ levels in dewers, streamline the refill tracking and record keeping function, and improve the overall efficiency and accuracy of data recording in the Patient Care Bay logs and computer systems.

Organizationally, we have implemented a functional typography that more clearly delineates areas of responsibility and identifies several new staff positions for which we will seek funding and fill at a future date. This approach gives us a roadmap for growth and allows for easier identification of cross training opportunities for personnel redundancy. We are also updating all of our protocols and SOPs and installing new procedures for maintaining our documentation at current levels at all times.

R

A formal project management methodology is being phased into the organization. Staff training will be conducted throughout the month of February. This will help us greatly in managing the myriad of initiatives currently underway. In addition, all non-scientific research projects must meet new financial hurdles that produce an Internal Rate of Return (IRR) and cost justify themselves to receive priority treatment. In conjunction with the new project management methodology, weekly staff meetings and weekly project status reports have been reintroduced to our routine, along with a weekly Technical Staff Meeting for technical project and protocol review.

Financially, it is our intention to not only operate in the black in 2004, but to reestablish a true Endowment Fund that generates income for general operating expenses, expanded research projects, staff salaries, and marketing. By the time you read this article, Joe Hovey will have already produced our first budget forecast for the year using our new accounting system procedures. We have revamped the manner in which financial reporting is done and brought higher levels of efficiency that have enabled us to reduce accounting and bookkeeping staff and redeploy those resources elsewhere in the organization. We have implemented a strict cost containment policy, created an entirely new chart of accounts to enhance reporting, and modified our financial data entry procedures so producing consolidated reports requires no more than a few clicks of the mouse. We now have more accurate financial records than ever before.

Our Marketing strategy will be more extensive, more focused, and more professional. By mid April we will have completed a formal marketing plan designed to provide a consistent and more effective outreach program that we hope will increase our membership growth rate. Increased membership will provide much needed increased revenue and market penetration. As our flagship publication, we have committed to bringing you a bi-monthly *Cryonics* magazine instead of quarterly, beginning with the January/February issue. We intend to expand the circulation by 20% without increasing costs, and reach more of the general public by supplying more public libraries and universities with complimentary subscriptions.

We have established a formal publication schedule that we are confident will be consistently met. Unfortunately, due to our newly aggressive publication schedule, Lisa Locke will be unable to continue on as Editor. On behalf of Alcor and its members I want to personally thank Lisa for all of her past efforts. The level of professionalism and quality of the magazine is a direct result of her leadership. Lisa will still provide proofreading assistance and serve as a content advisor, so we will not entirely lose the benefit of her considerable talents.

In partnership with *Cryonics* magazine, we have committed to a monthly publication of *Alcor News*, our eMail newsletter. Initially, I wanted to publish *Alcor News* on alternating months from the magazine. However, input from the staff and from the membership has convinced me that the target audience for the newsletter is quite different from the magazine, and that the more brief, technical format of the newsletter warranted a monthly publication schedule.

Public relations will get a much higher priority and focus from this leadership. More community and political involvement is essential for raising public awareness of the positive aspects of cryonics and for combating hostile legislation that is rumored to be in the making. Alcor representatives will attend as many community group functions as feasible. Press releases to the public will become a regular occurrence as operational improvements are made, and more effort will be made to invite the public to our facility for regularly scheduled tours.

Fundraising will be a major focus for all of senior management in the organization. We intend to work with Alcor member/attorney James Clement to develop a "Planned Giving" program to generate more consistent and predictable revenue streams. We will put into place "Expense Shifting" programs that will allow every member to help support Alcor through their normal everyday spending habits without having to dig deeper into their pockets. It is an exciting concept that could greatly impact our bottom line even if only a fraction of the membership participates. We want to pursue corporate sponsorship opportunities to gain access to a larger pool of funding by making Alcor more of a mainstream organization. Furthermore, institutional advertising will be increased to develop the Alcor brand.

As you can see, the staff at Alcor is hard at work pushing the frontiers of the science of cryonics. Our membership and patients are always at the forefront of our minds and influence every decision we make. We welcome your input and suggestions on how we can serve our members even better. Feel free to contact us at info@alcor.org. See you in the future!

Alcor Membership Status

Alcor has 659 Suspension Members (including 106 Life Members) and 59 patients in suspension. These numbers are broken down by country below.

Country	Members		
	Applicants	Subscribers	
Argentina	0	0	1
Australia	8	1	3
Austria	1	0	0
Canada	20	5	12
China	0	0	0
France	0	0	1
Germany	3	1	2
Italy	0	2	3
Japan	1	1	2
Lebanon	0	0	1
Mexico	0	0	1
Monaco	2	0	0
TOTALS			
659 111 291			

Country	Members		
	Applicants	Subscribers	
Netherlands	1	0	1
Russia	0	0	3
South Africa	0	0	1
South Korea	0	0	0
Spain	0	5	0
Sri Lanka	0	0	1
Sweden	0	0	1
Switzerland	0	0	2
Taiwan	0	0	1
U.K.	14	9	7
U.S.A.	609	87	248
TOTALS			
659 111 291			



1988—A Year to Remember

by R. Michael Perry, Ph.D.

The year 2003, especially the last half, has been a time of testing. Legal challenges have been made to cryonics-related operations in different parts of the country; events are still running their course. So far, no major disaster has happened, and for this we can be cautiously optimistic. Alcor itself does not seem threatened, and cryonics appears safe in our present home state of Arizona, which respects the legal recognition we fought so hard for and won in California in the early 1990s. Though not a panacea, these hard-won victories make the outlook more favorable for cryonics overall. Underlying this success are two good, additional reasons for confidence that have the solid backing of moral force: *our cause is just* and *we are dedicated*. The dedication shows in the tenacity with which a small band of thoughtful adventurers have maintained the life-affirming practice of cryonics over decades of public indifference and sometimes hostility. Other times of testing have occurred, some more trying than the present, and we have pulled through and emerged stronger than ever.

One of these tougher times was 16 years ago—1988 offered a solid year of legal confrontations for Alcor, struggles that would culminate, years later, in the legal recognition that would strengthen cryonics as a whole. Digging in, we held our ground and also managed some positive accomplishments. Progress was made in suspension techniques, conferences were held, media coverage surged, information requests poured in. The signup rate did not dramatically increase (as it did in the years that followed) but still held its own. Hardship can be a harbinger of better times to follow, as more or less happened this year, and, indeed, the subsequent publicity probably resulted in more benefit than harm, even when the going was toughest. But we were lucky. Such instances of good fortune are no reason to tempt fate. We must instead be careful and diligent at all times, and in particular try to *minimize* confrontations with an establishment that is powerful and could easily do us great harm while convinced it is doing good.

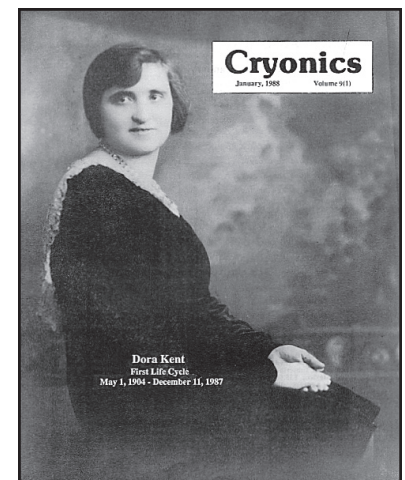
Before proceeding with details I should mention that many of the events of 1988 have been considered elsewhere, one notable place being a previous “For the Record” article dealing

with Alcor’s legal struggles. This was nearly five years ago and, though there is some overlap, I’ve aimed here for a different emphasis, with more comprehensive coverage though still dealing mainly with highlights, while limiting the time frame to one year.

Dora Kent Case

The troubles for Alcor in 1988 started the previous December when Dora Kent, the mother of long-time cryonics activist Saul Kent, was brought to Alcor’s facility, then in Riverside, California. The motive was a simple one of wanting to provide the best possible cryopreservation starting from the point of clinical death. Individuals qualified to “pronounce” this event—Jerry Leaf and Mike Darwin—were both present; the more formal details could be handled by a physician who would soon be visiting—so it was thought. Thus it happened that no physician was present when the gravely ill, 83-year-old woman expired at Alcor’s facility and her cryopreservation was started. This went well but the absence of the physician started a coroner’s investigation that turned increasingly hostile. In January the facility was raided twice and property was seized, including Alcor’s computers. During the first raid several Alcor staffers and one visiting member were detained in handcuffs for several hours at the local police station.

Fortunately no Alcor patients were harmed during the raids, despite attempts to seize Ms. Kent, who had been preserved as a neuro (head only) but was not at the facility on either occasion. Her headless torso had been autopsied earlier by the coroner’s of-



Dora Kent on the cover of Cryonics, January 1988

fice, which initially found that her death was from natural causes. A court ruling on February 1 protected the patients, including Ms. Kent, from further threats of autopsy, but the troubles did not end there.

On February 23, a new “finding” by the Riverside County coroner declared that Ms. Kent had been alive when the cryopreservation was started, in view of metabolites found in her system during the autopsy. (These substances could also be accounted for by the metabolic support that is routinely given cryonics patients after legal death, in an effort to minimize deterioration. But cryonics procedures were not covered in the training our opposition in the coroner’s office would have received.) Claims were then made that Alcor was guilty of (1) homicide, (2) practicing medicine without a license, and (3) theft of medical equipment used in its procedures. The investigation and subsequent legal wrangling would drag on for years. Ultimately, the coroner’s office had to face the reality that its heavy-handed methods had failed to produce the evidence to sustain its claims and, moreover, resulted in actionable offenses for which more than \$100,000 would be paid in out-of-court settlements to Alcor personnel and attorneys.

Change of Leadership

Mike Darwin, who had been president of Alcor since 1982, relinquished his title to Carlos Mondragón in February. Mike continued his extensive involvement in Alcor, including, among other things, working on suspensions, dealing with the media, writing magazine articles, and handling contacts with officials.

Media Coverage and Other Contacts

The media became interested in the Dora Kent affair when, late the previous December, the coroner, Ray Carrillo, first hinted that “maybe she wasn’t dead after all” when the freezing had started, contrary to the initial findings. Carrillo was a short, stout, sixtyish-looking man with a silvery beard who evidently liked the limelight and called a press conference specially to air his revised opinions, before an investigation could be undertaken. (Cryonics meanwhile were not oblivious to the well-publicized turn of affairs so it’s not surprising that Ms. Kent was unavailable when the search warrants were served that would have resulted in her autopsy.) Media interest redoubled after the first raid on January 7 and remained strong as one after another newsworthy incident developed over the year.

Initially this interest was centered on the Kent case itself and the lurid details of the “missing, frozen head,” but soon it broadened to include Alcor and cryonics more generally. One ambitious effort to document the practice of cryonics came from Uden Associates in London for British Television’s *Equinox* series. Titled “The Living Dead,” it received a mixed and somewhat damning review from an unhappy Mike Darwin, who had worked extensively with the show’s producer, Valerie Kaye, who in turn came to California and shot some footage at Alcor in April. Overall, though, Mike grudgingly rated the show a plus, in large part because it included a lengthy explanation and defense of cryonics from a well-known cryobiologist and in this

respect could be considered a first in its field.

Otherwise there were frequent calls from the media, including talk show hosts, magazine writers, and newspaper reporters, and articles and programs were numerous. This in turn led to an onslaught of information requests, which kept staff members busy with phone calls and mailings and no doubt contributed to the wave of signups that started in earnest the following year.

Religious Belief Against Autopsy

As a cryonics organization, Alcor did not (and does not) constitute or endorse an establishment of religion. Yet by 1988, Alcor’s paperwork included a Certificate of Religious Belief to be signed by the applicant, stating that “my religious belief compels me to oppose any postmortem procedure, dissection, or autopsy which would in any way delay, impede, or prevent the cryonic preservation of my remains.” Credit for this goes to attorney and cryonicist H. Jackson Zinn, who drafted the document in 1985 for the Bay Area Cryonics Society, later American Cryonics Society, of which he was then president. (The California law permitting a religious objection to autopsy was passed late in 1984; it is worth pointing out, however, that it does not apply where an autopsy is deemed necessary to determine the mode or cause of death, as in a suspected homicide. Some other states have enacted similar laws.) Most cryonicists were not strongly religious in any traditional sense, and few - if any - could cite any recognized scripture or creed they had adopted that would forbid their remains being autopsied. (This still holds today.) Thus the question arose of how, to remain under the protection of the law, the unwillingness to submit to autopsy could be justified on “religious” grounds.

It is worth noting that so far the issue had not received much attention in the courts (nor has it yet, a decade and a half later), yet as usual cryonicists wanted to be prepared for the unexpected contingencies that so often have occurred in their small and controversial practice. Toward the end of legitimizing the religious claims of cryonicists, and for other reasons, the Church of Venturism (later known as the Society for Venturism) had been set up in 1986 by Arizona businessman David Pizer and others. The Venturists did not require beliefs in the supernatural but did place hopes in immortality through cryonics and future progress, thereby claiming a meaningful engagement with “what is of ultimate significance.” In August 1988, the IRS recognized the Venturist organization as “scientific, religious, and educational” and granted nonprofit, tax exempt, 501c(3) status. Later, in November, the Venturists came up with their own version of a religious objection to autopsy that elaborated the Zinn/Alcor document and introduced a specifically religious element. Cryonic preservation, it was noted, may lead to “eternal life”—an indefinite or even infinite extension of one’s conscious existence. Any acts, such as autopsy that prevent or impair this preservation could prevent or adversely impact one’s achieving eternal life. Such preservation does no harm to others nor does it infringe their rights, so any interference “is an infringement of my religious belief and upon the free practice thereof as guaranteed by the Constitution of the United States.”

Whole-Body Case Causes New Legal Snarl

Robert Binkowski was long-time cryonicist and Alcor member who lived in Florida. A victim of congestive heart failure, the 72-year-old Binkowski experienced cardiac arrest just after midnight, Sunday, May 8 (still the evening before by California time). The pre-dawn, weekend timing of the event was bad, as is often the case. (People tend to expire when the rest of the world also shuts down and the help they need, in cryonics cases, is hard to reach.) An additional complication was that it occurred at home—the patient wanted to be with his family for what might be the last time. (They were not cryonicists.) On the plus side, his son, highly sympathetic and understanding of his father's wishes, promptly packed the head and neck in ice. But no medical personnel were present, so the case was deemed an unattended death. When the patient's physician could not be located to sign a death certificate, the local (Dade County) medical examiner became involved. Fortunately, an Alcor member in the area, Bill Faloon, had previously established good rapport with the ME, so the patient was released after a minor fluid extraction rather than the full autopsy that could have been performed. In all though, the delays from the ME's examination, the procurement of the signed death certificate, and the long plane ride to California meant that the patient arrived at Alcor headquarters nearly 24 hours after arrest. There was substantial clotting, which would make cryoprotective perfusion more difficult, but the head and neck were in surprisingly good shape.

The cryopreservation itself, the first since Dora Kent and the first whole-body case done under Alcor's direction, was fairly routine. A new procedure ensured a more even, less stressful "ramping" or increase of cryoprotective agent (CPA) during the perfusion phase, when the blood and body fluids were replaced by this antifreeze solution to protect the tissues against freezing damage during the later cooling phase. (In those days the CPA

was glycerol, not nearly as good as what is now used at Alcor, but far better than nothing.) A newly developed computer program predicted amounts of CPA that would be needed and helped ensure that this part of the operation was going as planned. Some extra effort was required to handle the entire body for the cooldown from dry ice to liquid nitrogen temperature, but it was managed using a large rocker assemblage, or "cradle." First a tall dewar was inserted upright into the cradle, then it was rocked down to a horizontal po-

sition. The patient was then inserted horizontally and the dewar rocked upright again for the cooldown. (The cradle had been built some years before by Hugh Hixon to handle other whole-body cases transferred from another organization.)

The patient had been legally, certifiedly dead before arriving at the facility, so, we thought, at least there should be no problem this time over *legal* issues, right? Wrong. The problem this time, it turned out, came directly from the fact that the patient was whole-body, which made us look like a mortuary or cemetery, something state officials were not prepared to accept. In particular there was no provision on the Vital Statistics "VS-9" form for cryopreservation or "cryonic suspension" as it was usually called back then. (Neuros by comparison were considered "tissue samples" and thus escaped this stricture. Generally a neuropreservation counted as a cremation since that is what was done with the rest of the body.) Working out this one issue would take years, though finally the courts decided completely in Alcor's favor (except, as usual, when it came to recovering court costs, which were not inconsiderable). Our operations meanwhile continued unhindered.

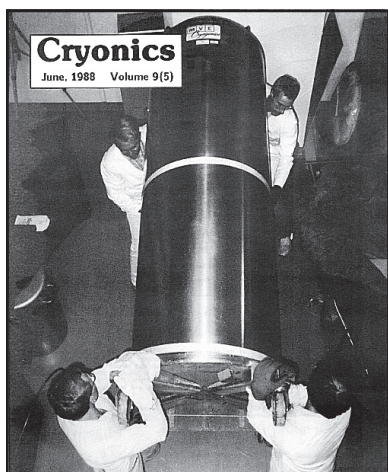
Conferences

Brief mention should be made of the three cryonics conferences Alcor sponsored in 1988. All titled *Life Against Death*, the first two conferences were in California (Ontario, end of May; San Francisco, early September); the third was in New York City, in late October. Topics covered included cryonics and the current legal problems, nanotechnology, and anti-aging research and strategies. Saul Kent was the chief organizer and financial backer.

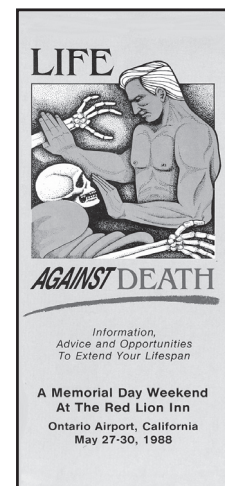
Coroner's Capers

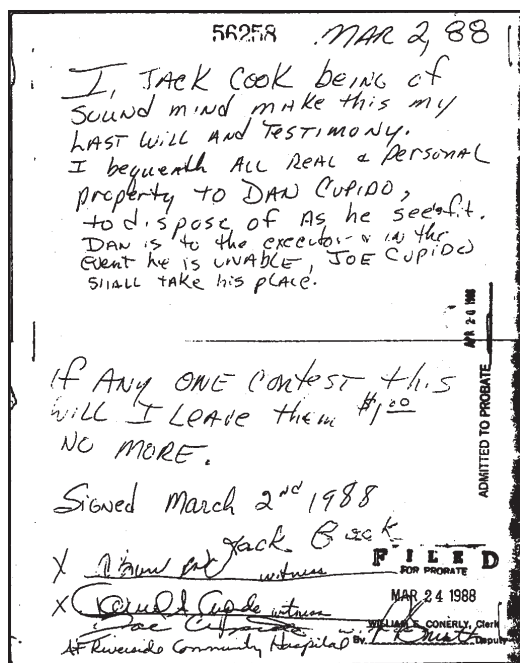
We saw how Riverside County Coroner Ray Carrillo saw fit to call a press conference to air doubts on the Kent case rather than quietly pursue an investigation until the facts could be clarified. The coroner's office in fact was involved in several odd capers in 1988 that cast doubt on its credibility and indirectly helped our side. In July the body of a suspected murder victim was cremated by mistake before it could be autopsied. In October a house recently vacated by a husband-and-wife team who worked for the office was found to have been doing dissections at home, on the picnic table in the backyard. Careless movers, they'd left behind many boxes of human body parts pickled in formaldehyde. These were first noticed by the new tenants' cat.

Finally, there was the strange matter involving Supervising Deputy Coroner Dan Cupido and his late friend and coworker, Jack Cook. Cupido had been prominent in the action against Alcor and was a possible candidate for coroner at the next election, still some years away. Before Cook died, he scratched out a shaky signature on a brief, handwritten will that appeared to be in a different hand (two different hands actually) from his own. His



Tall dewar is rocked down to horizontal position for inserting the patient, Robert Binkowski, for cooldown to liquid nitrogen temperature. From the cover of Cryonics, June 1988.





Jack Cook's will, from *Cryonics*, October 1988, p. 11.

entire estate, with an estimated worth of more than half a million dollars, went to Mr. Cupido. It turned out that two of the three witnesses to the will were Cupido himself and his brother, Joe. Relatives of Cook sued, claiming he'd been taken advantage of in his terminal illness. The will would be upheld in court, but Cupido's reputation was damaged, and he didn't run for coroner.

Preservation without Litigation

Alcor's next cryopreservation started October 7. The second of three done in 1988, it was unique for two reasons. It was the only neuro, and it was the only case that did *not* involve litigation! There was a connection between the two, but (to reassure the whole-body advocates) it was loose and largely temporary. Robert Binkowski's case was litigated because he was whole-body, as we have seen, but this would change when Alcor's right to do cryonic preservations was legally recognized. And Dora Kent, who started the whole cascade, was neuro.

In the summer of 1988, Alice Schwarz, an emphysema victim in Indianapolis, Indiana, realized the end was near and became interested in cryonics. Her son, Bob Schwarz, and Steve Bridge, a longtime cryonics activist and future Alcor president, were good friends who lived nearby. Paperwork was completed, finances were arranged, and things were in readiness when, in the first week in October, it appeared that only a few days remained. Mike Darwin and Jerry Leaf flew out from California and were there to start the "body washout" of the 78-year-old woman when the time came. During this crucial, initial phase of the preservation process, the blood and other body fluids are replaced by a "base perfusate" as a preliminary to the introduction of cryoprotective agent. The washout ensures both that the CPA will not be affected by blood, which would impede its entry into

the body, and that clotting, a further impediment, will also not be a problem. (In the previous case, the washout did not occur until the patient had been shipped, and clotting made the subsequent operations more difficult.) After the washout the patient was shipped to California, and the remaining perfusion with CPA and subsequent cooldown went well.

Lighter Side (for Humans Anyway)

Up to now this report has dealt with human beings and their problems, but humans aren't the only creatures in the world. At Alcor we had a large aquarium visitors saw when just inside the front entrance. (Mike Darwin can be credited for this.) Inside were two oscars—big, roundish fish about the size of a large human hand. I had the task of feeding these creatures and otherwise looking after them, something that didn't seem too demanding since their needs were few. But due to unfamiliarity with certain aspects of this, I made the mistake of dumping their food in one day in a way that caused them to become ill, to the point that an unhappy Mike Darwin predicted they'd expire within 24 hours.

Happily they didn't, and when Mike realized they were going to live he decided to give them names with an appropriate cryonics spin: Cool Head and Still Here.

Dick Jones

The three-time Emmy-award-winning TV producer and script writer Dick Jones (Richard Clair Jones, stage name Dick Clair) was Alcor's most famous member when he fell victim to AIDS-related complications on December 12. Another whole-body case, this cryopreservation went better than the one in May. It helped that the 57-year-old patient lived in southern California close to Alcor's facility. In addition the death was well-attended by medical personnel who were at least adequately cooperative if not necessarily sympathetic. In fact, considerable legal wrangling had taken place in the previous several months to ensure that Jones's hospital would cooperate. For obvious reasons, this contest had ended by the time Jones was suspended, but then a new legal ruckus erupted over his estate, worth a rather considerable amount by Alcor standards, around \$4 million. Jones had left almost all of it to Alcor, but, less than three days before expiring had been persuaded to sign a new will leaving a big slice to his relatives.

Jones was then suffering from toxoplasmosis of the brain, a consequence of the AIDS-caused compromise of his immune system, and was (arguably) not competent to sign a will. Nevertheless, the courts would eventually side with witnesses from the relatives' camp who attested to a "window of lucidity" Jones had experienced that would validate the signing. At least it can be said that the portion of the estate that Alcor did receive, which included future income from reruns of shows Jones had produced, stood us in good stead in the years to come and helped get us where we are today. And Jones, of course, deserves much credit for his long dedication to cryonics, which started back in the 1960s before Alcor was founded and also well before he became wealthy.

The cooldown for Dick Jones was straightforward but, in those days before automation, a whole-body case was demanding, particularly the cooldown from dry ice to liquid nitrogen temperature. It was especially so now—we were trying a more exacting procedure than what we'd used for Binkowski seven months before. This was to further reduce thermal stresses, which might cause cracking of the tissues. A 24-hour vigil was required, with technicians relieved to sleep. The cooldown system had to be carefully tended during this time, with cold nitrogen gas introduced at intervals, to ensure that the slow temperature descent was maintained with minimal differences in the temperatures registered by the different probes. Finally the cooldown ended December 27, and the patient was placed in long-term storage.

Closing Thoughts

The remaining few days of the year were uneventful at Alcor, but in the world outside something happened that affected me personally: my mother died. Though I had long tried to interest her in cryonics, she had always demurred, citing religious objections. The evening of December 31 found me in a mortuary in Leadville, Colorado, contemplating the consequences. The mortician had done a good job, I had to admit. I could not tell by appearances that the still figure before me was not simply sleeping—except maybe by the very stillness—but appearances count for only so much. I bring this up to make the point that while we are possibly saving a few lives with our strenuous, costly, and sometimes well-contested efforts, the rest of the world is still mostly indifferent, if not hostile. It is a planetary problem we must, as always, try to address as best we can. We must keep doing what we are doing, keep trying to do it better, and look for ways and opportunities to interest others. *We must ask how we can win those hearts and minds.*



SOURCES

Most of the foregoing is recounted in the issues of *Cryonics* from January 1988 through January 1989, available online (text-only version) at Alcor's web site: <http://www.alcor.org/CryonicsMagazine/>. Other sources include *Venturist Monthly News*, December 1988, unpublished documents at Alcor Foundation, and personal recollections of myself and Hugh Hixon. For Alcor membership totals, including 1988 and years following, see (among other locations) *Cryonics*, 3rd Quarter 2002, p. 23.

Editor's Notes

We'd like to apologize for the lengthy disruptions to our publication of *Cryonics* magazine. Several significant management changes have occurred recently, and we're committing to both a regular and more ambitious publication schedule. With each annual subscription, we'll be sending out six issues, published on a bi-monthly timetable. We hope that this schedule will improve the timeliness of the information we provide.

Good News

Subscription lengths will be adjusted, so that regular subscribers receive an additional two issues, in compensation for the gap in issues last year; and subscription rates will not be changed, despite the increased number of issues we plan to publish each year. We also intend to improve our educational outreach by expanding the number of universities and community libraries receiving our magazine, providing these subscriptions free of charge. If there's a deserving institution in your area where you'd like to see *Cryonics* magazine placed, please let us know.

Given the accelerated publication schedule, we'd like to encourage our readers to submit articles for publication. We're particularly interested in articles relating to cultural adoption of cryonics, supporting articles for the technical basis of cryonics, or even speculative fiction addressing things like potential revival scenarios. If you're interested in preparing an article for us, please contact the editorial staff at articles@alcor.org for information on submission deadlines or word count.

Thank You Lisa

With all the other changes going on in Alcor right now, we also must mention the departure of Lisa Lock as Editor of *Cryonics* magazine. Lisa has been our Editor for more than three years, but she has found herself unable to allocate sufficient time to our accelerating schedule. Lisa has been performing her duties throughout the years as a volunteer, and other responsibilities (including her role as a Lieutenant in her local Fire Department) will prevent Lisa from assuming an even greater role. We'd like to vigorously thank Lisa for her years of dedication and hard work, and hope that she finds success in her many endeavors.

That said, we will be looking for a new Editor for *Cryonics* magazine. Our new Editor should have all the requisite technical skills needed for laying out and illustrating publications, plus be committed to expanding our lists of contributors, advertisers and topics. If you know of any likely candidates, please let us know at info@alcor.org.

Once again, we apologize for the difficulties we've had with our production schedule, and assure you that we're doing everything we can to ensure that no such gaps exist in the future.

How to Grab an Atom. Like a diner spearing a morsel of food with the tine of a fork, researchers have used the tip of a microscopic needle to lift a single atom from a surface and then replace it. The experiment, reported in the 2 May PRL, marks the first time single atoms have been manipulated using a purely mechanical technique, rather than one involving electric current. The new method could allow researchers to maneuver single atoms of nonconductive as well as conductive materials, perhaps for nanoscale circuits of the future. (*Physical Review Focus* 5/3/03) <http://focus.aps.org/story/v11/st19> [NGN 5/11/03]

Playing God. Through genetic engineering, you could give birth to an Olympian, a musical prodigy, or a genius—but should you? Bill McKibben is a man on the edge. He lives on the edge of the Adirondack wilderness in New York, where he writes books about the limits of technology. Fifteen years ago, he wrote *The End of Nature*, in which he argued, with cogency and foresight, that human dependence on fossil fuels was endangering our relationship to the Earth itself. In his new book, *Enough*, McKibben describes a new edge. We've come to a threshold with the emerging technologies of genetic engineering, robotics, and nanotechnology, McKibben believes. One more step and we will "call into question our understanding of what it means to be a human being." "Please, sir, could I have less?" Bill McKibben argues that our thirst for technological progress threatens the nature of humanity. Genetic engineering, nanotechnology, robotics, and other related technologies may, he writes, "alter our relationship not with the rest of nature but with ourselves." McKibben argues that this debate is too important to be left to scientists. "Must we forever grow in reach and power?" he asks, "Or can we, should we, ever say, 'Enough'?" (*Christian Science Monitor* 5/1/03) <http://www.csmonitor.com/2003/0501/p15s01-bogn.html> [NGN 5/11/03] and (*San Francisco Chronicle* 4.27.03) <http://www.sfgate.com/cgi-bin/article.cgi?f=/chronicle/archive/2003/04/27/RV183594.DTL&type=books> (More)

Nanoscale Networks. For a decade, materials scientists have dreamed of using cylinders of carbon with walls just one atom thick as the building blocks for a new generation of sensors, transistors, and other tiny devices. Before that happens, however, researchers must find better ways to grow and align these carbon nanotubes. Jie Liu and his colleagues at Duke University in Durham, North Carolina now report growing the longest individual carbon nanotubes ever and aligning them in a two-dimensional grid. (*Science News* 5/3/03) <http://www.sciencenews.org/20030503/fob2.asp> [NGN 5/11/03]

Nanoprobe to Be Developed for Treating Deadly Tumors. A UC Irvine research team has received a five-year, \$1.4 million National Institutes of Health grant to develop a microscopic probe for detecting and treating pre-cancerous and malignant tumors in humans. Similar to the miniaturized vessel that explores a human body in the science fiction movie *Fantastic Voyage*, this nanosized probe would be inserted into a patient and then guided through the esophagus, stomach, and colon to determine if tumors are growing on the wall of the intestine. The probe would be remotely controlled by a surgeon operating a device called an endoscope. (*Science Daily* 5/9/03) <http://www.sciencedaily.com/releases/2003/05/030509085108.htm> [NGN 5/11/03]

Nanotube Computer Memory. A new type of computer memory uses carbon, rather than silicon. Carbon comes in many forms. Diamonds and graphite are two of the most familiar ones. A less familiar variety is the nanotube, also known as a "buckytube" after Richard Buckminster Fuller, whose geodesic domes have a framework similar to the arrangement of the atoms in a nanotube. Nanotubes consist of a cylindrical array of carbon atoms whose diameter is only about 1 nanometer (a billionth of a meter). If Nantero, a firm based in Woburn, Massachusetts, proves correct, such tubes will soon be an integral part of computer memories. (*The Economist* 5/8/03) http://www.economist.com/science/displayStory.cfm?story_id=1763552 [NGN 5/11/03]

IBM Finds Plenty of Room at Bottom. In an incredibly tiny development which marks a giant leap in nanotechnology—the science of working on the atomic and molecular scale—global computing giant IBM's research division has created the world's smallest solid-state light emitter. The breakthrough is a graphite nanotube—a sheet of graphite (a form of carbon) rolled into a tube—transformed into the world's first electrically controlled, single-molecule light emitter. (*The Times of India* 5/11/03) <http://timesofindia.indiatimes.com/cms.dll/xml/uncomp/articleshow?msid=46006004> [NGN 5/11/03]

Carbon Onions Offer Clues to Space Mystery. Tiny multilayered balls called "carbon onions," produced in laboratory studies, appear to have the same light-absorption characteristics as dust particles in the regions between the stars. "It's the strongest evidence yet that cosmic dust has a multilayered onionlike carbon structure," said Manish Chhowalla, assistant professor of ceramic and materials engineering at Rutgers, The State University of New Jersey. Chhowalla used transmission electron microscopes to study radiation absorption of the laboratory-produced onions and found characteristics virtually identical to those

reported by astrophysicists studying dust in deep space. A carbon onion is a miniscule but intricate component of nanotechnology—the study of structures and devices on a scale that can approach one-millionth the width of a human hair. (ISA 4/30/03) http://www.isa.org/Template.cfm?Section=Professionals_and_Practitioners&template=/ContentManagement/ContentDisplay.cfm&ContentID=26090 [NGN 5/11/03]

Nanotech Points to Building Science Revolution. Budding science will spur flurry of inventions. In the not-too-distant future, your house could be built with strong tiles that heat the rooms with solar power. Inside you could watch a smooth, flat-panel TV with electronic components built right into the glass instead of a web of wires at the back. Nanosys Inc., a small Palo Alto nanotechnology firm, plans to deliver these and other products within the next three years. Nanosys's inventions arose from the type of industry collaboration with academic labs that Congress has been trying to promote since 2000 through an escalating round of funding for nanotechnology research. (SF Gate 5/8/03) <http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2003/05/08/MN171263.DTL&type=tech>

Companies Bring War to Nanoscale. One of the many take-home lessons for the United States and its allies after the 1991 Persian Gulf War was a need for better protection against biological and chemical weapons. Years after the conflict, soldiers complained of ailments they believed resulted from exposure to the Iraqi regime's arsenal. More than a decade later, several companies are turning to nanotechnology to counter the threats of biological and chemical warfare. Their efforts range from gloves and gear that block out toxic chemicals and germs to fabrics and powders that deactivate and destroy the deadly agents. Military and university research labs also are developing protective skin creams, emulsions, and even drugs to reduce the dangers. (*Small Times* 5/8/03) http://www.smalltimes.com/document_display.cfm?document_id=5957 [NGN 5/11/03]

MIT, Army Open Nanotech Center. The Massachusetts Institute of Technology and the U.S. Army formally unveiled the Institute for Soldier Nanotechnologies, which is geared toward creating battlefield armor for the 21st century. MIT on Thursday (May 22) cut the ribbon on the nanotechnology institute, which was funded by a \$50 million grant from the Army in 2002. Corporations including Dow Corning, DuPont, Raytheon, and Carbon Nanotechnologies are participating in the center's development. In all, private companies have invested \$40 million in the center. The center's research can largely be characterized as chemistry in action. During a ceremony held at the university on Thursday, researchers showed off a technique for applying new types of coatings to fabrics to make them more resistant to water or capable of killing bacteria. Other projects involve developing fabrics that will contract or expand like an accordion when exposed to electricity; these materials could potentially be used for

in-field medical devices such as tourniquets. (CNet 5/23/03) http://rss.com.com/2100-1008_3-1009571.html?type=pt&part=rss&tag=feed&subj=news [NGN 5/24/03]

Nanotech Funding Shifts to Policy Arena. The nascent nanotechnology industry needs to start playing by the same public-policy rules as other government-funded technology programs, the former chairman of the House Science Committee told the Nanobusiness 2003 conference on Tuesday (May 13). Former congressman Robert Walker, now a Washington lobbyist, reminded conferees that federal funding for nanotechnology research is close to final approval in Congress. "You are real, the House just passed the nanotechnology funding bill," Walker told about 150 executives. "Now you need to play in the public policy arena." (*EETimes* 5/13/03) <http://www.eet.com/at/n/news/OEG20030513S0037> [NGN 5/24/03]

Souped-up Superconductivity. For materials that carry electricity without resistance, a little nanotechnology turns a major turnoff into a turn-on, says a team of researchers. Ordinarily, a magnetic field quashes the currents flowing freely through a superconductor. But when decked out in tiny magnetic dots, a superconductor may behave just the opposite way and carry electricity freely only when exposed to a magnetic field, the team reports in the 16 May PRL. Their technique might someday boost the current-carrying capacity of superconducting wires, or set the bits in quantum computers. (*Physical Review Focus* 5/19/03) <http://focus.aps.org/story/v11/st21> [NGN 5/24/03]

Nanotube Network to Simulate Brain Structures. NASA researchers have developed a way to grow miniscule networks of carbon nanotubes that are similar to brain synapses, in the hope of building smarter and more reliable computers. The lead scientist for the project, Deepak Srivastava, used computer simulation to build a network of carbon nanotubes that look and behave like the small spaces between nerve cells called synapses through which nerve impulses travel. (*Betterhumans* 5/21/03) <http://www.betterhumans.com/News/news.aspx?articleID=2003-05-21-2> [NGN 5/24/03]

Turning Bubbles into Microscopic Syringes. Turning bubbles into microscopic syringes through the use of sound has been experimentally shown by researchers in the Netherlands (Claus-Dieter Ohl, University of Twente), demonstrating a potential method for injecting drugs and genes into specific regions of a patient's body. Taking high-speed microscopic photographs, the researchers revealed that even bubbles much smaller than the thickness of a human hair could transform into a needle-like tube, delivering a billionth of a millionth of a gallon of liquid. While this sub-nanofluidic volume seems very small, it is more than enough to transfer large molecules (such as DNA and most drugs) into desired cells for medical therapy. (*Physics News Update* 5/14/03) <http://www.aip.org/enews/physnews/2003/split/637-2.html> [NGN 5/24/03]

Electron Experiment Shows Quantum Computing Promise.

Physicists at Rice University have completed the first real-time measurement of individual electrons, creating an experimental method that for the first time allows scientists to probe the dynamic interactions between the smallest atomic particles. The research, which appears in the May 22 issue of the journal *Nature*, is important for researchers developing quantum computers, a revolutionary type of computer that is orders of magnitude more powerful than any computer ever built. (Rice University 5/21/03) http://riceinfo.rice.edu/projects/reno/Newsrel/2003/20030521_electrons.shtml [NGN 5/24/03]

Insulated Carbon Nanowires. Berkeley Lab scientists have created insulated electrical wires that are about 100,000 times narrower in diameter than a human hair. These insulated wires are single-walled carbon nanotubes encased within an outer sheath of boron nitride nanotubes. The ultra-high-strength wires were reported in the 18 April 2003 issue of the journal *Science*. (Berkeley Lab 5/12/03) <http://enews.lbl.gov/Science-Articles/Archive/MSD-nano-insulation.html> [NGN 5/24/03]

Nanoparticles Brighten Fuel Cell Prospects. The car of the future will use a fuel cell and will be refuelled with hydrogen. Unfortunately, such a refuelling process lasts more than one hour with most of today's technology. But now researchers of the Forschungszentrum Karlsruhe (Research Centre Karlsruhe, Germany) have made an important step on the way to a better hydrogen storage system. With custom-made nanoparticles, researchers reckon they could reduce the refuelling time to a few minutes. To improve the storage process, the research team used nanotechnology. With custom-made catalysts made from so-called titanium nanoclusters, researchers at the Institute for Nanotechnology shortened the refuelling times of today's hydrogen tank material to 7 to 8 minutes. (*Fuel Cell Today* 5/23/03) <http://www.fuelcelltoday.com/FuelCellToday/IndustryInformation/IndustryInformationExternal/NewsDisplayArticle/0,1602,2939,00.html> [NGN 5/24/03]

Advance toward Robot Muscles. Muscles of metal for miniaturized robots or small prostheses—this is one of the visions that may become true by a discovery made by the Forschungszentrum Karlsruhe. Scientists have developed a novel nanoporous metal that expands reversibly when an electric voltage is applied. In this way, electric energy can be converted directly into mechanical energy. For the first time worldwide, macroscopically measurable length changes have thus been induced in a metal by application of low electric voltages. This breakthrough allows various microtechnological components to be conceived, the industrial property rights of which have been applied for in the meantime: Switches and controls, direct voltage indicators or other sensors, actuators, and—by making use of the reverse effect—motion transducers. (Forschungszentrum 4/10/03) http://presse.fzk.de/aktuelles/presseinfo/2003/PI07_2003_e.html [NGN 5/24/03]

Medical Nanobots. Nanotechnologists are making incredibly tiny biomedical devices that may someday deliver drugs inside your body or repair internal injuries. As raw material, some researchers use only natural molecules like DNA and RNA. At UCLA, one biomedical engineer is designing what he calls “bio bots” from natural molecules and plastic parts. (KXAN t.v. 36 news in Austin Texas 5/22/03) <http://www.kxan.com/Global/story.asp?S=1291002> [NGN 5/24/03]

Nanocontainers Deliver Drugs Directly to Cells. One challenge to effective drug treatment is getting the medication to exactly the right place. To that end, researchers have been investigating myriad new methods to deliver pharmaceuticals. Findings published in the current issue of the journal *Science* indicate that tiny nanocontainers composed of polymers may one day distribute drugs to specific spots within individual cells. Radoslav Savic and his colleagues at McGill University tested the properties of tiny units built out of two types of polymers. The two compounds self-assemble into a spherical shape known as a micelle. (*Scientific American* 4/28/03) <http://www.sciam.com/article.cfm?chanID=sa002&articleID=0001D485-BEC8-1EA9-BDC0809EC588EEDF&catID=7> [NGN 5/24/03]

Memory Cells Caught in Act of Learning. NIH-funded scientists have detected direct evidence of individual brain cells signaling the formation of new memories. Neurons they call “changing cells” in the hippocampus, the brain's memory hub, emit tell-tale signals as a monkey learns an associative memory task, the researchers have discovered. While past studies established that new associative memories—such as learning the name of a new acquaintance—can't be learned without the hippocampus, none had pinpointed such smoking guns of memory acquisition at the neural level. Wendy Suzuki, Ph.D., New York University (NYU), and colleagues, report their findings in the 6 June 2003 *Science*. (NIH News Release 6/5/03) <http://www.nimh.nih.gov/events/prchangingcells.cfm> [MP].

Miniature Gears Engage on Liquid Surface. U.S. scientists have made cogs and gears that assemble themselves, experience little wear, and perform gyrations quite beyond conventional interlocking tooth systems. Instead of rotating on fixed spindles, sets of the gears can continue to drive one another while traversing freely along a meandering path. These unusual mechanisms have been designed and built by George Whitesides and colleagues at Harvard University in Cambridge, Massachusetts. Their components float on the surface of a liquid, and are held together only by mutual forces of attraction, just as leaves clump on a pond surface. Some of the gear wheels have no fixed teeth at all—rather, their teeth are made from liquid. In principle, one gear of this kind could drive another turning at quite a different speed. (*Nature Science Update* 6/16/03) <http://www.nature.com/nsu/030609/030609-17.html> [NGN 6/20/03]

You and Your Bracelet: An Introduction

By Todd Huffman

Chances are, if you are reading this magazine, you are wearing an Alcor medic alert bracelet and have been doing so consistently for some time. While Alcor is available twenty-four hours a day, it is beneficial for you to fully understand the information on your bracelet. A suspension can be substantially improved if the protocols on the bracelet are followed, so it is in your best interest to be able to convey your post-pronouncement wishes with your family or doctors. Potentially, your family may have to communicate these wishes with doctors on your behalf.

Because of the limited space, there are a number of abbreviations, the first being MED. HX., short for medical history. In everyone's signup paperwork, there is a medical history section; and in an emergency, a doctor can call Alcor and obtain crucial medical information that may assist in the treatment of the patient. Additionally, this provides an initial contact between the medical provider and Alcor, alerting Alcor to the situation and establishing an important line of communication.

The emergency phone line at Alcor is active twenty-four hours a day, and someone is always on call to answer. Both numbers on the bracelet work, and the 800 number has been bought by Alcor and can never be reassigned due to a phone company change. Some older bracelets have numbers from Riverside; and all of those numbers still work and transfer calls to Alcor's facility in Scottsdale, Arizona.

REWARD receives questions fairly frequently, and Alcor does indeed offer a reward to the first person initiating contact on the behalf of an Alcor member in the case of their demise. Four hundred dollars is offered, but no one has ever accepted the money. Often, this is because the person making the call is employed by either a hospital or Medical Examiner's Office, and there are internal regulations against accepting such rewards.

The patient's A number is located in the lower right hand corner, and this number is useful to Alcor both as a filing system and as

a method of protecting patient privacy. In cases where a member requests confidentiality Alcor will not use their name when communicating details of a case, but instead use the A number.

On the back of the bracelet are brief instructions for medical providers to carry out in case of death. Heparin is an anti-coagulant readily available to any emergency healthcare facility. A patient who receives the bracelet protocol and whose temperature has dropped to 10° C is significantly protected from damage, and will remain stable while Alcor gets personnel and equipment in place.

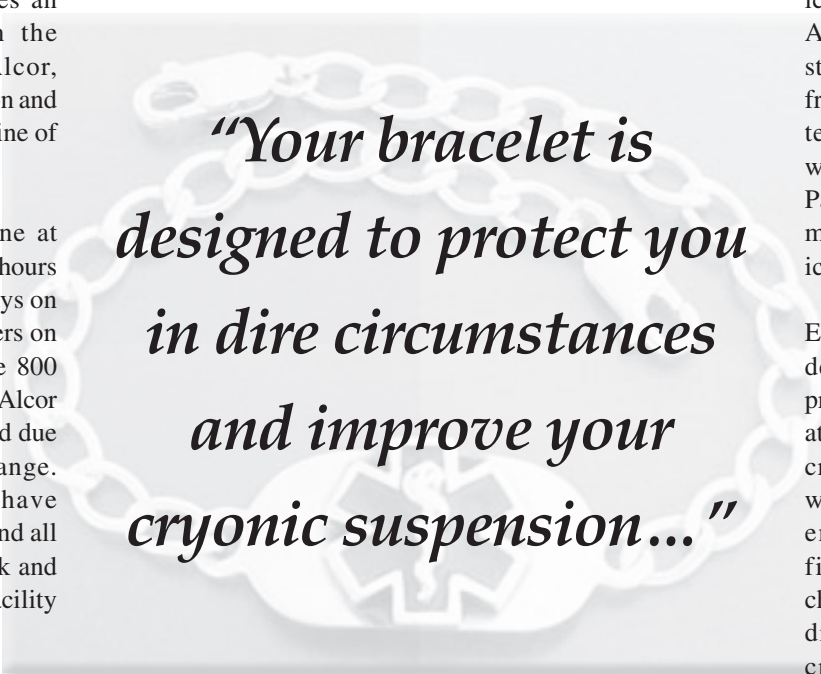
For cooling, the recommended method is to put ice in Ziploc® or other sealable bags and surround the patient. This is generally not difficult for hospitals, which often have copious amounts of ice available in the cafeteria.

A very important note is that storage in the hospital morgue freezer is unacceptable, as the temperature is too cold and will cause ice formation. Patients should be stored in a morgue *refrigeration* unit or in ice alone.

Embalming is a major detriment to the suspension process, and should be avoided at all costs. Alcor uses special cryoprotective fluids in its washout procedures, and the embalming fluid contains fixatives, which alter the chemical structures of tissues, disrupting the perfusion of cryoprotective agents. Autopsies, however, are much

more damaging.

Autopsy damage ranges from delaying cryopreservation to compromising vascular systems to direct damage to neural tissue. A barrier to damage caused by the medical examiner is religious objection to autopsy. This is valid in six states, sometimes honored by medical examiners in other states, but is never guaranteed to work. Criminal investigations often lead to an unavoidable autopsy. In those cases, the best course of action is to minimize the scope of the autopsy; external examination is sometimes



*"Your bracelet is
designed to protect you
in dire circumstances
and improve your
cryonic suspension..."*

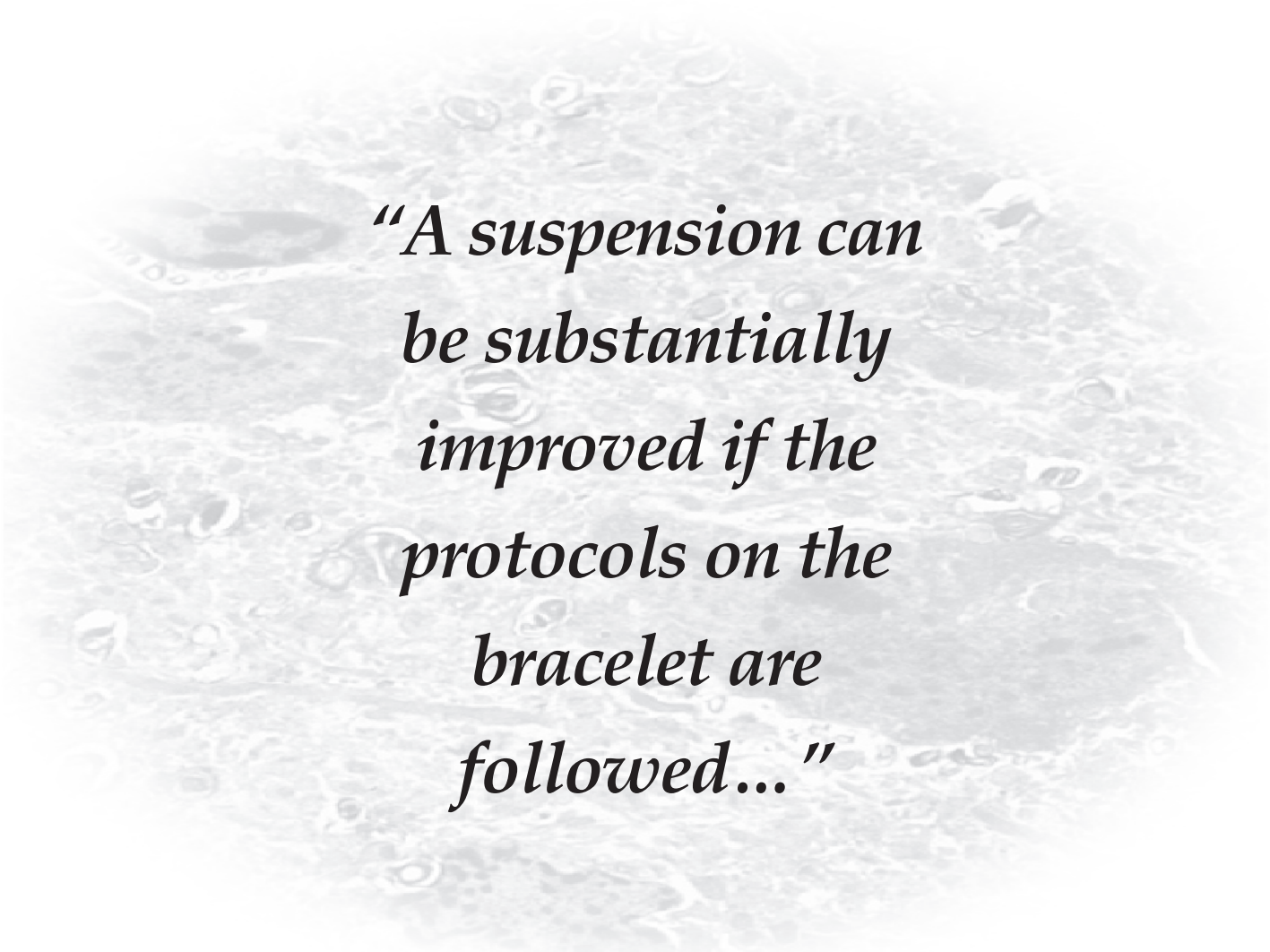
sufficient to determine the cause of death. Minimizing the time delay because of autopsy is important as well; and often Alcor convinces medical examiners to move Alcor patients ahead in the queue.

On some occasions, the “keep pH 7.5” has been confusing. To keep the pH at 7.5 the doctor should measure the pH of the blood, and if necessary administer bicarbonate by IV. This step is less important than the heparin, ice and CPR, but should be done if time and circumstances allow.

Alcor’s medic alert bracelet has a similar design to conventional medical alert bracelets. This is because paramedics and

emergency room personnel look for these bracelets and will find Alcor’s information quickly. For such reasons, Alcor discourages people from having their own version of bracelet made which is more cosmetically appealing. The new design may be disregarded as jewelry in unfortunate times.

Your bracelet is designed to protect you in dire circumstances and improve your cryonic suspension, if one is needed. Improve your chances of survival by discussing the bracelet with your friends and family so they will understand what your wishes are in the event of a medical emergency. Most importantly, remember to wear your bracelet at all times, because without it there may be a long delay before Alcor is alerted to your situation.



*“A suspension can
be substantially
improved if the
protocols on the
bracelet are
followed...”*

Letters to the Editor

Letters to the editors are most welcome on all topics, including counterpoint on previously published materials and suggestions as to future content. We especially invite questions about cryotransport (cryonics) that are original and far-reaching. If you are seeking information about Alcor, please consult our web site, at www.alcor.org. If you have questions about developmental programs within Alcor, you may stir us into talking about them even sooner than we might have otherwise. If your letter is lengthy and involved, we may use it as a separate article and may ask you to expand it. We need your ideas, your personal visions. This is the place to start.

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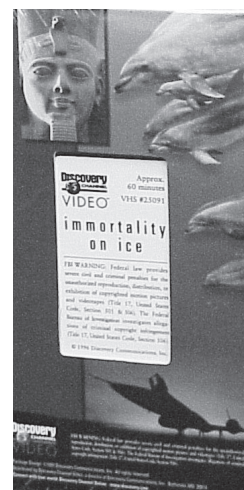
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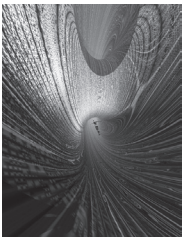
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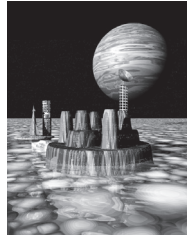
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