

# CRYONICS

## The Alcor CryoTransport Program

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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 5<sup>th</sup> 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 increas-

ingly 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*  
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**about the cover**

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# Glass Transitions

## A Project Proposal

by Fred Chamberlain  
President/CEO, Alcor



### SECTION I PROJECT INTRODUCTION AND SYNOPSIS

#### Introduction

A transition from the procedure of cryonics, as perceived by the public, to a nearly damage-free state of cryopreservation, is within our grasp. Research by 21<sup>st</sup> Century Medicine, Inc., has advanced the state of the art to a point where humans pronounced “dead” under controlled conditions could have an even higher probability of long-term survival than those who remain alive and die under less controlled conditions. This incredible state of affairs is virtually invisible to the general public at the moment, but that condition is about to change.

A large gap exists between the emerging scientific state of the art and Alcor’s practical readiness to carry out procedures based on it. There are serious shortfalls in trained and qualified personnel; most of Alcor’s equipment is of a rudimentary kind; detailed designs for reliable applications of vitrification still have to be worked out. Any small-town clinic or hospital is funded at a higher level than the support presently available for upgrading and maintaining Alcor’s response and operations capability. It is very much as if we have the knowledge to build the *Queen Mary*, but whenever we put out to sea, we are aboard the *Kon Tiki*.

An urgent gap exists with regard to design and construction of the TimeShip (an independent project to build a major storage and research facility; see page 23). Our current storage technology is either irrelevant or of a very primitive level. Yet, TimeShip is already traveling down a pathway of development, which seems certain to continue. A near-term effort in supporting technology development is needed.

Research announcements by 21<sup>st</sup> Century Medicine, Inc., and emergence of the TimeShip project as a publicly visible effort, coupled with the general public upswing of foresight into the implications of rapidly advancing biotechnology, could produce demand outstripping supply. Those who will soon become aware of the research advances of 21<sup>st</sup> Century Medicine, Inc., will expect to find these technologies available as deliverable services. They will be inclined to make arrangements for these services and to provide cryopreservation for members of their families who are beyond help by current

medical technology. The TimeShip concept could give the public the picture that a “rescue ship” is about to come over the horizon. However, instead of the *Queen Mary*, we have the *Kon Tiki*.

#### Synopsis of Proposed Project

Alcor proposes to bring reality into line with the vision. The mission statement of the *Glass Transitions Project* is:

***“To Develop and Implement a Practical Program for Human Cryopreservation Using Vitrification Technology.”***

This will require the following advances:

1. A dependable “core” cryotransport team will be established, headed by a physician, an Alcor member residing in Scottsdale, Arizona, and devoting all of his energies to this endeavor. Other Alcor members (medical professionals) will participate on a part-time or consultant basis, with a roughly professional level of compensation. Present Alcor ACT (Alcor CryoTransport Team) members will constitute a support infrastructure for logistics, communications, and coordination, and participation at levels consistent with their limited medical skills and training. *Glass Transitions* will fully redefine roles in cryotransport rescue, with respect to team credentials, credibility, and competence.

2. Operating room instrumentation, perfusion equipment, and patient handling platforms and enclosures will be upgraded to provide for both whole-body and neuro-vitrification. Well-worked-out designs and user-friendly documentation will allow us to replace the current failure-prone, hastily jury-rigged systems (which are as yet only well known to a few critical personnel) with reliable systems supported by a broad set of well-trained personnel. These advances are essential to Alcor representing that it possesses a competent capability to carry out the procedures expected of it. *Glass Transitions* will lead to a state of system design and training compatible with establishing secondary operating sites and, as demand grows, operating capabilities in hospitals similar to those of MRI units.

3. Cooldown systems for neuropatients will be reduced to sound designs and will be documented, both as to fabrication and operation. Then, these will be scaled up to provide for whole-body cooldown at temperatures consistent with good potential for vitrification. Current crackphone technology,

based on outdated computers and undocumented data acquisition systems fabricated by volunteer members, will be upgraded to acceptable standards in the same way that the perfusion systems (see no. 2, above) are brought up to par. Comprehensive measurements of temperature will be implemented, to provide confidence that the procedures meet the standards of the protocols. Through cooperation with other laboratories, analysis of cellular viability in biopsies from vitrification patients will be conducted. In this way, *Glass Transitions* will make reliable whole-body vitrification a confirmed reality.

4. Patient storage systems will be developed that will make it feasible to care for those who are in cryostasis at fracture-free temperatures, with high reliability and safety from warm-up as well as economy. This will be a large component of the “practical” part of the Project’s mission; “to develop and implement a practical program for human cryopreservation using vitrification technology.” This part of the project will provide two major benefits:

a. Storage of patients will be more reliable and affordable than could earlier have been anticipated. Concerns existed that, for example, Alcor might have to raise the suspension funding requirements for vitrifying neuros to the same levels as for whole-body nonvitrification funding. Early indications are that with modest increases to funding requirements for its new members, Alcor will be able to grandfather existing members at their current levels of funding. However, this is dependent on the proposed development program.

b. The technology developed will be geared to meet the most stringent requirements of larger assemblies for the same purpose in the TimeShip. The project will pioneer the engineering model phase of storage on the TimeShip, a cost that would have had to be met in any case. Since the technology will be used with actual patients, after initial reliability testing, there will be a far higher degree of confidence that application of it, scaled up, will not be problematical.

## Summary

*Glass Transitions* is a three-year project designed to bridge the void between early systems of placing people into undefined cryogenic states, prior to whole-body vitrification, and what could soon be regarded as a hopeful alternative to cremation and/or burial. Funding is expected to come from a number of sources. The Florida Cryonics Association (FCA) is sponsoring the Project’s lead physician’s salary and may support specific facets of technology development. Additional donations are expected to come from Alcor’s members and other philanthropically oriented organizations and individuals. BioTransport, Inc. is expected to cooperate in the project by devoting virtually all of its financial resources to it as may be derived by additional investments as well as BioTransport’s income from Cells4Life, Inc.

*\*\*Version for Cryonics Magazine*

This version of the *Glass Transitions Project* proposal has been edited for publication in *Cryonics* and does not include

the complete sections on financial requirements, task breakdown, or milestone charts. Some discussions of technical details are omitted, where extensive tradeoffs remain. However, this version does include sufficient detail to constitute public disclosure of some technical approaches that might be regarded as patentable, in view of (1) Alcor’s tax-exempt, public benefit charter, and (2) Alcor’s concern that it not be blocked in carrying out its procedures by those who might attempt to “patent the obvious” and then demand royalties. Readers of *Cryonics* may be assured that no disclosures of truly valuable patentable ideas are made, nor is there any compromise of those from whom Alcor has obtained access to advanced technologies, through BioTransport.

## SECTION II PAST AND PRESENT PRACTICES

### Past Practices

The practice of cryopreservation in humans dates from the late 1960s, when (at best) DMSO and/or glycerol were added to a base perfusate of Ringer’s solution. The first well-documented procedure was reported in Manrise Technical Review in the early 1970s. It was performed by early cryonics technologists who more recently have been engaged in vitrification research and the advanced resuscitation methods.

In the late 1970s, after Jerry Leaf formed CryoVita and carried out extensive experimentation in low temperature extracorporeal circulation with canines, Alcor’s procedures were at a state where the challenge was to raise 3 molar glycerol levels to 6+ molar. Until the last year or two, nothing was added in the way of improvements to the vast majority of the routine procedures and protocols. Improved cryoprotectants with freeze blockers were still on the horizon.

### Present Practices

Alcor practices, not including recent upgrades by BioTransport (see next section), date back to the methods of ten years ago, at the time Jerry Leaf was suspended. Over the last several years, many volunteer members have been trained in systematic approaches to conducting field operations, facilitating early access, avoiding autopsy, administering medications, and providing prompt transportation to Alcor’s laboratories in Scottsdale, Arizona. An increasing percentage of those involved are medically trained, and a number of physicians are part of the team—on call, all the time.

The day-to-day supervision of Alcor’s response and rescue operations fall to nonmedical staff. Lack of manpower has limited improvements to developing a system for field blood-washout. Refinements in the crackphone system have been postponed for years; all computers used for cooldown, crackphone, and patient care are “pre-pentium.” This does not emphasize the need for replacing computers, as a priority. Rather, it illustrates a more general problem; the equipment involved with our practice is outdated and largely obsolete, with the exception of improvements recently made by BioTransport, as discussed in the next section.

Patients in the course of cryopreservation are perfused with cryoprotectant, cooled to liquid nitrogen temperature, then transferred to long-term storage. Perfusion is divided into two stages, washout and cryoprotection. In washout, blood is replaced with base perfusate, currently MHP2 (an in-house preparation containing hydroxyethyl starch), prior to introduction of cryoprotectant, whose direct introduction would be inhibited by blood. Cryoprotection utilizes a "cryoprotectant" (up to now, glycerol), introduced into the patient at controlled rates until a desired concentration or other terminal condition is reached.

Cooldown is divided into two parts, a dry ice and a liquid nitrogen stage, based on the principal coolant used. In the dry-ice stage the patient (in plastic wrapping) is immersed in "silcool," a silicone oil with a low freezing point, in a stirring vessel. Silcool from a second stirring vessel, chilled by direct contact with dry ice, is introduced in controlled amounts to lower the temperature. The liquid nitrogen stage uses a highly insulated container into which cold nitrogen gas is introduced in controlled amounts. See figure 1 at right for the layout of the cooldown bay.

Cracking in the patient, indicated by sound emission as cooldown progresses, is monitored using sound-detection probes that are placed in the patient prior to cooldown. Normally cracking occurs only during the liquid nitrogen phase of the cooldown, starting as the temperature nears  $-100^{\circ}\text{C}$ . The system used for this type of measurement is designated as a *Crackphone Monitor*. Patients currently are stored in insulated containers (dewars) that are filled with liquid nitrogen to maintain a temperature of  $-196^{\circ}\text{C}$ . (This must be modified for the warmer storage temperatures needed to prevent cracking in vitrified tissue.)

### Limitations Behind Current Practice

Alcor's current budget, even allocating one third of it for cryotransport readiness and training, would not even support a single physician or professional researcher, working alone, on a full-time basis. Even if a physician or other professional were to accept a drastic salary reduction to be involved, there would be no provision for assistance by other staff, purchase/lease of equipment, or overhead expenses.

If Alcor were dependent on hiring at market levels, it would be forced to reduce or eliminate many elements of its service levels and curtail its capabilities to respond in emergencies. It would have made almost none of the upgrades reported in the next section, and its staff would not have been briefed on advances in the pipeline from research sources. In early 1997, owing to such factors, there were pressures on the part of some Alcor Board members to move toward a "storage only" posture, where Alcor would not attempt to address advanced technologies but rely on these to be forthcoming from free-market sources, at some future time, with no visibility into what the costs might be, or whether or not such services would be affordable to its members.

The alternative, which involved forming BioTransport, Inc., was to anticipate the need for a strongly funded capital-based service provider, and create one. At the same time,

solutions to financial viability were essential.

Recent experience clearly indicates that the formation of a capital-based entity in itself is not a complete answer. BioTransport, Inc., has expended, as documented in the full version of this proposal, more than \$100,000 with no regard to the near-term financial benefit of the corporation. It could have continued to expend resources until all that had been invested was gone, with no prospect of any income, but that would have made no sense. This being the case, BioTransport created Cells4Life, Inc., to generate income, and at this point BioTransport is winding down its cryotransport upgrade program. Other solutions, in the near term, will be essential. This Project, promoted and financed as discussed in Section I, is the most potentially feasible and viable solution to preventing a roll-back of Alcor's capabilities.

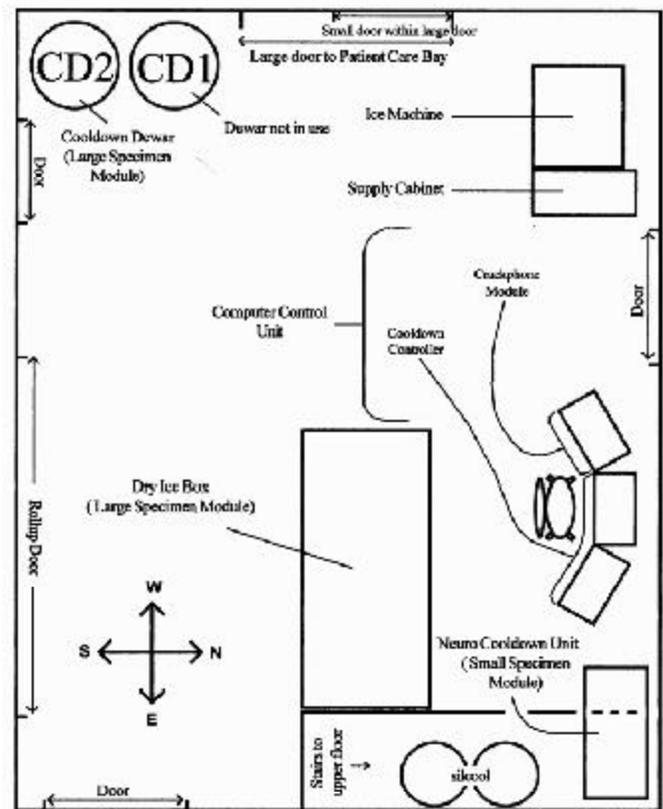


Fig. 1. Alcor's Cooldown Bay with major components (silcool barrels and part of neuro cooldown box are underneath stairs).

## SECTION III BIOTRANSPORT, INC., UPGRADE PROJECT

### Background

The initial business plan for BioTransport, Inc., was to develop an operational capability to offer cryopreservation to the general public on a last-minute basis (i.e., no membership or pre-need arrangements required). In the spring of 2000, the emphasis within BioTransport, Inc., shifted to two other areas.

The first of these areas was to upgrade the cryotransport capabilities supporting the Alcor Life Extension Foundation

membership. This was in response to requests from one of BioTransport's major investors, where the upgrades were fully consistent with BioTransport's long-term goals. These upgrades directly led to Alcor's ability to apply new materials for vitrification, in the case of its most recent two neuropatients.

The second shift in emphasis involved the launch of a new business (Cells 4Life, Inc.) for the preservation of viable cells for therapeutic cloning, pet cloning, the preservation of endangered species, etc. This shift of emphasis is required to address the need for ongoing funding for the more basic business pursuit of supporting Alcor in the area of cryo-transport operations, and upgrading capabilities to include vitrification technology for human cryopreservation patients.

### Specific Capability Upgrades

The implementation of vitrification technology in neuropatients has been the initial focus. Over the past several months there have been numerous upgrades and purchases of equipment.

**Medications Upgrades:** Consultation with staffs of two other research firms was carried out for maximum preparedness in connection with upgrades toward vitrification discussed above. Subsequently, medication kits were modified to eliminate expired medications, and different medications called for by the improved protocol were substituted for those no longer considered to be optimum.

**Response Capability Upgrades:** One possibility of an early application of the upgrades toward vitrification necessitated deployment of the primary Alcor ambulance to southern California for approximately six months. This required the use of a backup ambulance at Alcor Central (in Scottsdale, Arizona) for coverage during deployment of the primary vehicle. Ambulance reliabilities (both primary and backup) were raised by a survey of possible failure modes and repairs as necessary to both vehicles.

**Improvements to Cooldown:** Optimized vitrification will require a rapid cooldown to the target temperature of  $-130^{\circ}\text{C}$  followed by indefinite hold at this temperature. This is a substantially different cooling protocol from that now in use. The testing of two different rapid cooldown approaches showed that a lower-cost method was better. This raised hope that costs for a new vitrification suspension protocol may not require a large increase in present suspension funding requirements.

**Rapid Cooling Media:** A heat exchange medium for cooling to the vitrification temperature range (with a melting point below  $-130^{\circ}\text{C}$ ) is needed. Hydrofluoro ether (HFE) was explored first as it is a liquid at room temperature, with a melting point below  $-130^{\circ}\text{C}$ . With these characteristics it could serve this purpose.

Tests showed that a rapid cooldown to  $-130^{\circ}\text{C}$ , starting near water ice temperature, or  $0^{\circ}\text{C}$ , is possible starting with pre-cooled HFE. However, three serious problems were noted: (1) the high cost of HFE (around \$250/gallon) substantially raises the cost of the cooldown; (2) extreme thermal inertia of the system, necessitating large, prolonged infusions of nitrogen gas even for slow cooling rates; and (3) the tendency of the liquid to become very viscous or even freeze during the

cooldown, greatly impeding heat exchange and slowing the cooling rate.

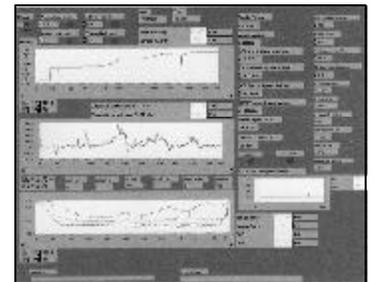
Fortunately, an adaptation of existing software and hardware, by Hugh Hixon and Mike Perry, resulted in an important breakthrough in rapid cooling that yields the enormous side benefit of cooling in nitrogen gas (heated  $\text{LN}_2$  vapor). This made possible a less expensive method of cooling directly with cold nitrogen gas (obtained from a pressurized cylinder of liquid nitrogen). This eliminates the problems associated with HFE. Public disclosure of this approach, without the mechanization details, is (in particular) intended to block any attempt to patent this method and thereby deny its use to Alcor. Alcor has used a system intrinsically like the one now used for rapid cooling, for over a decade. There are great benefits to this new wrinkle, but nothing patentable.

**Perfusion Upgrades:** A new perfusion procedure has been implemented using the (now out-dated) glycerol-based cryoprotectant. BioTransport, Inc., has expended a sizeable sum to: (1) license from 21<sup>st</sup> Century Medicine, Inc., the use of a new and improved cryoprotective agent and freeze blockers; (2) purchase an initial supply of these chemicals; (3) purchase the components and laboratory equipment necessary to formulate usable mixtures of these new chemicals for use in subsequent suspensions; and (4) make considerable improvements in computer software for monitoring the course of perfusion with these new chemicals.



Mathew Sullivan and Hugh Hixon (left to right) at console for refractive index measurements with upgraded perfusion system.

Data display of refractometer system



**Use and Stockpiling of New Perfusates.** The new perfusates have now been used in two Alcor suspensions, and Alcor stockpiles 20 to 30 liters, adequate for five neurosuspension patients. This should virtually eliminate ice crystal formation, achieving complete vitrification of the tissues. Tremendous benefits could also be obtained in whole-body patients, even if slowly cooled, if these materials were utilized. The acquisition

of additional stock, however, requires resources beyond those currently available. Also, there are annual license fees that need to be paid. Project funds are required to cover these expenses until Alcor's fees for new members are adjusted to reliably assure that application of these methods to whole-body patients can be made as part of Alcor's routine procedures.

**New Surgical Approach:** A new procedure was tested recently for neurosuspensions, where cephalic isolation is performed prior to perfusion with cryoprotectant. This new procedure offers several advantages: (1) It eliminates the costly and wasteful perfusion of the trunk; (2) direct access is provided to the carotids and vertebral arteries that service the brain, eliminating the possible limited perfusion that would result if the Circle of Willis is not intact; (3) high levels of cryoprotectant are readily achievable, even under adverse circumstances; and (4) greater accuracy is possible in monitoring the amount of cryoprotectant being delivered to this all-important neurological locus.

**Software Improvements:** A program has been written in LabVIEW to detect and record refractometer readings (voltages) in the course of perfusion, convert them to concentrations of cryoprotectant, and calculate rates of increase of cryoprotectant concentration using curve-fitting techniques. In this way we obtain a quantitative estimate of how the perfusion is proceeding, which is important in deciding when to terminate perfusion and advance to the cooldown phase of the operation.

**New Mixing Equipment:** A disperser and heater have been acquired, greatly reducing the time required for mixing perfusate. Improved capabilities for weighing and measuring dry components have also been procured. The advantages of these improvements in our capability include: (1) a dramatic decrease in preparation time; (2) a decrease in costly storage space required for the pre-mixed perfusate components; and (3) a dramatic improvement in our ability to respond quickly and adequately in a multipatient scenario.

**Storage at "Fracture-Free" Temperatures with a Cryostar Freezer:** A newly acquired, electric-powered, Cryostar freezer has been purchased that is capable of holding a temperature in the -130°C range. Such temperatures are appropriate for long-term storage of vitrified neuropatients. It is anticipated, however, that the Cryostar will eventually be used in the end stages of cooldown of vitrified patients rather than for long-term storage. This in turn will be handled by a unit yet to be developed that will use liquid nitrogen as the coolant and will also accommodate whole-body patients.

#### SECTION IV SUMMARY OF RESOURCES EXPENDED

The principal expenses by BioTransport, Inc., for the twelve months from November 1999 to November 2000, in upgrading cryotransport capabilities for Alcor, are summarized below (the original version contains additional expense breakdowns by spreadsheet):

<b>(1) Materials, Equipment, License Fees</b>	<b>\$ 88,512.31</b>
<b>(as follows)</b>	
1. Cooldown	\$ 441.06
2. Fracture Free Storage	\$ 14,978.06
3. Perfusion	\$ 39,204.03
4. Surgery	\$ 2,884.57
5. Transport	\$ 30,921.34
6. Miscellaneous	\$ 83.25
<b>(2) Consulting and Travel</b>	<b>\$ 1,657.00</b>
<b>(3) Labor</b>	<b>\$ 22,275.92</b>
<b>Total Expenses</b>	<b>\$112,445.23</b>

#### SECTION V PROJECT OVERVIEW

##### Overview

A "physician-led" team has been a priority for Alcor, ever since Allen McDaniels, M.D., resigned as President of Alcor in the mid 1970s and no physician was available to replace him. Recent experience strongly suggests that avoidance of autopsy can be far more reliably achieved by the intervention of a strong and determined physician. End-stage care in a terminal illness is the responsibility of the care-giver team, but an Alcor team led by a Board Certified physician can guide the process for better viability, where the care-giver team is receptive and cooperative.

Alcor's choice for this position is Jerry Lemler, M.D., has now relocated to Arizona, to be available for this responsibility. Dr. Lemler is selling a successful medical practice in the Eastern United States. He will participate in presentations of this proposal, so as to be well known to those who evaluate it and give approval.

Dr. Lemler is licensed to practice medicine in Arizona, and the plan calls for him to lead Alcor's Cryotransport Team on a full-time basis. This will inspire even more participation of medically trained Alcor members in Alcor's operations, on a volunteer or part-time basis. Dr. Lemler's involvement will increase the confidence of these other professionals that they will be adequately supervised, protected from liability, and accepted by their peers in the medical community.

Retainer-compensation for backup physicians is also important. Alcor has secured the services of a retired neurosurgeon and a licensed chiropractor on this basis already. Additionally, there is the prospect of recruiting a board-certified perfusionist on an immediate, part-time basis and obtaining the consulting services of a widely known M.D. whose book on longevity practices advocates cryostasis as a backup.

These professionals will augment Dr. Lemler's capabilities in two ways: they (1) will take on specific development tasks, under Dr. Lemler's supervision, which he could not manage single-handedly; and (2) will be available as team-participants in cryotransport operations. On a whole, this will be the most effective way to involve additional medically skilled team members, without full-time compensation.

Dr. Lemler, in addition to the management and operational duties described above, will oversee all aspects of technology applications under the *Glass Transitions Project*:

1. Operating room instrumentation, perfusion equipment, and patient handling platforms and enclosures will be upgraded to provide for both whole-body and neuro-vitrification. Well worked out designs and user-friendly documentation will replace earlier, rudimentary systems, well understood only by a few critical personnel.

2. Cooldown systems for neuropatients will be reduced to sound designs, well tested, and documented. They will be scaled up to provide whole-body cooldown at rates consistent with high potential for vitrification. Current crackphone technology, running on older computers and software developed by volunteer members, will be upgraded to acceptable standards. More comprehensive measurements will be part of the new cooldown systems, for confidence that the procedures meet the goals of the protocols. Through Cells4Life, Inc., validation analysis of cellular viability by biopsies from vitrification patients will be carried out.

3. Patient storage systems will be developed that will make it feasible to care for those who are in cryostasis at fracture-free temperatures, with high reliability and safety from warm-up as well as economy. This will be a large component of the “practical” part of the Project’s mission: “to develop and implement a practical program for human cryopreservation using vitrification technology.” This part of the Project will provide two major benefits:

a. Storage of patients will be more reliable and affordable than could earlier have been anticipated. Concerns existed that, for example, Alcor might have to raise the suspension funding requirements for vitrifying neuros to the same levels as whole nonvitrification arrangements. It is starting to appear that with modest increases to funding requirements for its new members, Alcor will be able to grandfather existing members at their current levels of funding.

b. The technology developed will be geared to meet the stringent needs of larger applications aboard the TimeShip. The Project will pioneer the engineering models, the cost of which would have to be met in any case. The technology will be used with actual patients, after reliability testing, so there will be a far higher confidence that applications of it, scaled up, will not be problematical.

## Summary

As Project Manager of *Glass Transitions*, Dr. Lemler will have responsibility for all phases of cryotransport at Alcor, including the development of applications for new technologies. He will supervise protocol formulation upgrading, training, logistics of team preparedness and evaluation, and all operations extending from the earliest stages of standby to the completion of cooldown. He will be assisted by others possessing appropriate qualifications, as discussed in the detailed sections that follow.

The best of Alcor’s staff will be assigned to this project;

additional technicians and an administrative assistant will be hired to assist Dr. Lemler in these broad responsibilities. A chain is only as strong as its weakest link. The purpose of this project is to bring the “service delivery” link up to the standards made possible by the research companies through which Alcor has access to advanced technologies via BioTransport, Inc.

The *Glass Transitions Project* will lead to a state of system design and training compatible with establishing secondary operating sites and as demand grows, when the need will eventually be to set up operating capabilities in hospitals similar to MRI units. The Project will fundamentally redefine roles in cryotransport rescue, with respect to team credentials, credibility, and competence. More basically, *Glass Transitions* will make reliable whole-body vitrification in humans a confirmed reality.

These advances are essential to Alcor’s carrying out, competently, procedures based on the new technologies now available to it. They are essential to Alcor members having the best chance to be saved, under widely varying conditions, which seem to never unfold the same way twice. As the details in the following sections illustrate, there is far more to the “prospect of immortality,” than an idea “whose time has come.”

## SECTION VI STANDBY AND TRANSPORT

### Overview

Cryotransport is a global term. It covers all aspects of getting a human patient to advanced medical technology that will not be available until some future time. The latter stages of this process include biological stasis applying such technologies as vitrification.

Such advances cannot be separated from the need to advance and improve the earlier stages of the process, however. Standby, the operations that lead up to the pronouncement of clinical death, and transport, those that occur after pronouncement, must match and complement the advances in cryopreservation and long-term care.

In order to upgrade standby and transport procedures, the following areas must be addressed: (1) revision of Standard Operating Procedures; (2) revision of manuals for team members; (3) upgrading and revising training classes; (4) training team members in the revised procedures; (5) recruiting and training new team members; and (6) recruiting and training additional medical professionals.

The tasks described below will all require the supervision of the Medical Director (Jerry Lemler, M.D.) who will be responsible for overseeing every aspect of the cryotransport operations. Dr. Lemler will need an administrative assistant and will need to consult with many of the other staff members as he continues to learn the existing procedures and how they will be changed.

### **Revision of Standard Operating Procedures (SOP):**

Written SOPs are an important part of standardizing procedures and guaranteeing a high standard of performance. As new

procedures are developed, it is critical that these be reduced to writing for the purpose of training new employees and assuring that all employees know the standard of performance and care that are required. Without written SOPs, quality control becomes difficult, and the level of performance suffers.

**Revision of Manuals for Team Members:** The Cryotransport Manuals currently in use by members of the Alcor Cryotransport Team (ACT) are effectively SOPs for the operations involved in standby and transport. Most of these are in the form of checklists that are more usable during these operations than a narrative SOP would be. These Cryotransport Manuals will continually need to be updated as protocols improve and change.

**Upgrade and Revise Training Courses:** ACT team members are required to have annual continuing education and recertification in order to remain on the team. We currently have four levels of training: (1) physicians and medical professionals who participate in the surgical procedures involved in cryoprotection; (2) physicians and medical professionals who participate in the coordination aspects of standby and transport; (3) nonmedical professionals with advanced training and experience in standby and transport operations; and (4) nonmedical professionals who participate in standby and transport more as assistants (beginning, or basic level). Training courses need to be developed for each of these levels.

**Train Team Members in the Revised Procedures:** Once the new training courses have been developed, the ACT team will need to be trained. This requires a minimum of one class per responsibility level (see above). Scheduling problems often require that more than one class be held for each level. Training courses require not only the time to present the material but also a significant amount of organization and preparation time, both before (to organize materials, arrivals and departures, and class details) and after each class (to update badges for team members, letters of certification, updates in materials, etc.).

**Recruit New Team Members:** As our frequency of cryotransport operations increases, this will require an expanding number of both medical professionals and technicians on our cryotransport team. Currently, Alcor's policy requires that a new person joining the ACT team must (as a minimum) have had an EMT training course within the last five years. As new procedures are developed, and a potentially higher rate of membership growth results from the positive public awareness of improved biostasis, it may be necessary to develop new guidelines for minimum standards for participation on the Alcor ACT team.

**Recruit Additional "On-Call" Physicians:** Since the frequency of cryotransport operations currently averages less than two per year, Alcor has not yet been in a financial position to have medical professionals on staff (even part-time). The improved image of both Alcor and the general concept of biostasis over the last half decade have made it possible for Alcor to have physicians (some who are members, and some who participate by contractual agreement) on-retainer and on-call. As the frequency of cryotransport operations increases, it

will be necessary to increase the number of medical professionals to respond adequately to our greater responsibilities. These retainer fees will be less expensive (during this phase of growth) than hiring even part-time physicians.

**Automate Data Collection and Patient Records:** The final part of any cryotransport operation is the production of the patient record (from initial alert and standby through cryopreservation, cooldown, and long-term care or storage. As Mike Perry, Ph.D., will be heavily involved with the part of this proposal that addresses the automation of data collection during perfusion and cooldown, he can, under the supervision of the Medical Director, most efficiently automate and generate the cryotransport report.

## SECTION VII CRYOPROTECTION AND COOLDOWN

### *\*\*Qualification*

The following section of *Glass Transitions* was originally prepared with the thought that funding for it might be obtained from a single source. The reader will see this in terms of the attention given to careful phasing of the neuro vs. whole-body developments. Support at that level was not forthcoming, however, and thus the development will most likely take place in a more fragmented form. Particularly with donations, they are likely to come in with conditions attached, that the donors will want to see one aspect or another emphasized at higher priority. The overall Project will not, as a result, unfold as quickly or as efficiently as might have been the case otherwise.

Notwithstanding, Alcor will move ahead on *Glass Transitions* as rapidly as funding permits, even if the pursuit of it is more like the completion of a picture puzzle than the building of a brick wall. In the end, the idea is to move our rescue system up to the level of research findings with as little delay as possible, and that is what we intend to achieve.

### Overview

Cryoprotection for vitrification in neuropatients and whole humans can be subdivided into surgery and perfusion, but there are additional new facets, as compared with past procedures. The cryoprotective agents are more penetrating, and risks of toxicity damage strongly correlate with temperature. Cryobiological knowledge exists to optimize the procedure, but this requires excellent automation of the cryoprotective ramps. Benefits of subzero perfusion are coupled with difficulties in stabilizing the surface temperatures of patients.

Cooldown also has demanding requirements. Recent experiments at Alcor revealed that HFE as a cooling medium is improved upon by substituting circulated nitrogen gas, but this is only implemented for neuro patients presently, and the application is still make-shift and rudimentary. When we start to use subzero perfusion at the end of the cryoprotective ramp, in view of the risks of toxicity, it will be important to transfer the patient from the cryoprotection procedure working enclosure to the cooldown procedure enclosure with no

significant transient exposure to warm air, minimizing any delays in starting cooldown.

These criteria apply equally to neuropatients and whole-body patients, but the difficulties of competently handling whole-body patients will be greater. In both cases, systems-oriented, carefully integrated and tested designs are needed. First, systems for neuro patients must be developed, and then these must be scaled up for whole-body patients. Efforts to date have been urgently thrust forward, based on the pressures for immediate upgrades to achieve neurovitrification. A great deal of “catching up” is needed, to assure that the procedures can be performed competently and reliably, by a well-trained team with adequate redundancy.

### Timing Factors

Applications for neuropatients and whole-body patients cannot efficiently be developed in parallel. Important lessons could be learned in developing the neuro applications, making the whole-body effort far more efficient. A three to six month lag at the outset would be anticipated, between the two. Later, the lag would diminish, as efforts on the neuro part of the project wound down and all resources would go toward readiness to offer the whole-body vitrification procedure. The goal would be to have well-tested procedures to offer in both categories, at nearly the same time. Conversely, if whole-body vitrification were pursued at the current level of neurovitrification, without support for a finished design in neurovitrification first, the outcome would be a “breadboard” level of application in both, with a quality design deferred for a future phase of the project.

### Conceptual Designs and Task Breakdown Development

The cryoprotection-cooldown part of the project is complex. The complete project proposal contains detailed discussions, in terms of tasks anticipated in definition and design, test and evaluation, etc. Publication in *Cryonics* of such a treatment would be inappropriate. Below is a brief summary of the challenges expected in whole-body vitrification. This is barely an “outline sketch” of design considerations, far short of even what would be expected in a *conceptual design*. However, perhaps it is not out of line to present this very preliminary level of thinking to a general audience. It might at least give the reader a dim sense of what the project team will have to deal with, in developing methods for “whole-body vitrification.”

1. Patient Handling. The surgery required in whole-body patient vitrification is anticipated to be a median sternotomy and cannulation of the heart (aorta and right atrium), with perfusion of all parts of the body (including the brain) by a single system. There must be good surgical access to the patient during the cannulation procedures, but afterward, perfusion must be accommodated at subzero temperatures. This means that the partial enclosure of the patient (as presently used at Alcor) must be made complete, with chilled gas circulated in the enclosure at approximately the temperature of cryoprotective perfusion.

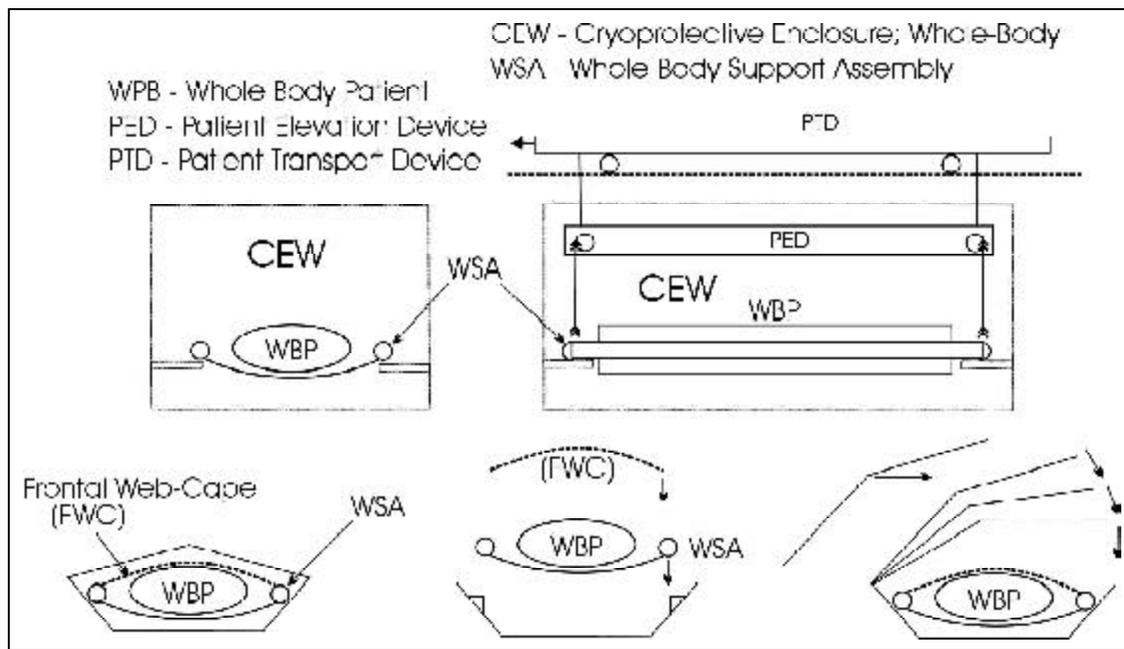
a. The enclosure serving this purpose may be designated as a “Cryoprotection Enclosure; Whole-Body” (CEW). The primary challenge in design of the patient handling subsystem will be provisions for transfer to a Whole-body temperature Descent Enclosure (DEW) at the end of cryoprotection. For this purpose, a Whole-Body Support Assembly (WSA) will be placed beneath the patient prior to surgery. This net, a web of flat straps supported by a rectangular frame, will permit the patient to be elevated in the DEW during gas flow for rapid cooldown, and will also serve the purpose of transfer from the DEW to the Long-term Enclosure for Whole-Bodies (LEW). The WSA will permit the patient to be rinsed with chilled water containing a disinfectant prior to cryoprotection, and it will permit any effluent not recovered from the patient by venous return to be collected in the CEW and returned to the perfusion circuit, during the cryoprotection.

b. Other major assemblies are needed for enclosing and handling whole-body patients during surgery, cryoprotection, cooldown, and storage. They will include, in addition to the CEW, DEW, LEW, and WSA:

1) Patient Elevation Device (PED) and Patient Transfer Device (PTD). An assembly is needed to elevate the patient within the CEW and move the patient to the DEW for cooldown. If the CEW and DEW are designed so as to be a single enclosure, then this device simply elevates the patient in the flow of chilled nitrogen gas for cooldown. This assembly is then designated a “Patient Elevation Device” or (PED). If the PED (carrying the WSA and patient) needs to be moved to a separate enclosure (DEW) for the cooldown procedure, this will require a “Patient Transfer Device” or (PTD), perhaps a tracked or railed carrier.

2) Whole Body Storage Assembly (WSA). Without needing to determine if the CEW and DEW are going to be two enclosures or one, we can see a need to move the patient to and stabilize the patient within a LEW for long-term storage after the rapid cooldown is completed. This must be accomplished without any significant (damaging) exposure to warm (laboratory temperature) air. Further, a tentative design criterion of the TimeShip is for whole-body patients to be stored upright (head up). The WSA must be augmented by a frontal support system, and then interface with the LEW so that the patient is positioned within the LEW in a stable way. More specifically, a “Frontal Web-Cape” (FWC) will attach to the WSA from the front, enclosing patient except for the face. Mounting points within the LEW attach to the WSA’s frame. Together, the WSA and FWC constitute a Patient Positioning Assembly (PPA) for long-term storage. The procedure for putting the PPA together and integrating it within the LEW, without exposure of the patient to changes of surface temperature, will be termed “Patient Storage Integration” (PSI).

3) Patient Storage Integration (PSI) Subsystem. Upon the completion of cooldown, the patient will be in a



horizontal position, suspended by the WSA. The FWC must be brought into position and firmly attached, securing the patient in a stable position and forming the PPA. The LEW must then be brought into the DEW beneath the PPA, and secured within it. Finally, the LEW must be closed and prepared for transfer to a storage container, which might be either a dewar or a cold-room. A large number of mechanical interfaces must be accommodated. Most important, the surface temperature of the patient must not be significantly disturbed, the patient's skin must not be damaged, and the patient's final stabilized position must enable the LEW to be moved without damage to the patient. The complexity of these operations warrant calling the devices to carry it out as a "subsystem." The figure above is only a preliminary block diagram, but it suggests a conceptual design.

4) Current Status. Present whole-body pods are optimized for use in a standard "Bigfoot" (approximately 40-inch inside diameter) vacuum wall dewar. Four of them can be fitted around the periphery of the dewar, allowing a central (square) well to accommodate a tower housing four neurocans. Design of LEW's must trade off compatibility with these dewars, which have an extremely tight envelope for large persons, and alternate envelopes margined for taller and more bulky frames. Patient packaging for vitrification needs to fit specifications for the future, not necessarily conform to past designs constrained by available commercial apparatus. (The "Bigfoot" is an extended-height dewar based on a product by MVE. In the early days of cryonics, this was a practical way to approach the challenge of whole-body suspension.)

2. Perfusion. As with the neuropatient system, the perfusion system for whole-body patients is comprised of an integrated assembly of reservoirs, pumps, circulatory tubing and connections, sensor interfaces, computer data acquisition and control subassemblies, and software. It is used in the same four modes: (1) cannulation support, (2) open circuit washout, (3) closed circuit stabilization, and (4) cryoprotection. Again, as with the neuropatient system, baseline systems already exist, and the main need will be for documentation. Software is at an early stage of development, and emergency shut-down controls are yet to be implemented. Pressure sensing as part of the automated data collection system has yet to be integrated. The portion of the perfusion circuit that extends to and within the CEW has yet to be designed. Here, not even a first attempt has been made to implement a configuration. The limitation is that until an enclosure (CEW) is designed, there is no basis for such an effort.

a. As is the case with the neuropatient perfusion subsystem, instrumentation for measurement of cryoprotective concentration is presently incompatible with subzero perfusion, completely aside from the fact that no conceptual design for an adequate CEW exists.

b. Among other problems, as discussed with Brian Wowk for the neuropatient system, is the necessity to provide for corrections of refractometer readings based on perfusate temperature. For the purpose of subzero perfusion, additional tubing circuitry and an additional pump will be required in both the arterial and venous lines, stabilized at 0° C or at slightly higher temperatures.

3. Cooldown. As mentioned in the discussion of patient handling (no. 1 above), there are needs for a cooldown enclosure design. Particularly in view of the large mass of a whole-

body patient, and the need to minimize movement, it will be worthwhile to consider combining the CEW with the DEW.

a. Present Practice. The present whole-body cooldown box is a massive assembly, constructed of ordinary building materials and not intended to be used below the temperature of dry ice. Present practice is for whole-body patients to be lifted into the air from a silicon oil bath by an overhead hoist onto a platform. Plastic sheathing is cut away, and the patient is lowered into a sleeping bag within a whole-body pod compatible with Bigfoot dewar dimensions (anticipating a very slow cooling rate). The pod is then hoisted vertically (patient head-down) until the lowest point is approximately ten feet above the workfloor, while a two-man liquid nitrogen dewar is rolled beneath. The pod is lowered into the dewar, and cold nitrogen gas is used to very slowly cool the patient (two degrees centigrade per hour maximum). None of this fits the needs of rapid cooldown for vitrification.

b. New designs are needed not only for the LEW but also for the enclosure in which the storage is effected. This, however, is beyond the scope of the Cryoprotection-Cooldown task. Once the patient has been stabilized at  $-130^{\circ}\text{C}$ , the rest of the procedures are properly those of long-term storage, except for the possibility that some annealing (very slow cooling in the temperatures just below the glass transition point) is required.

### Task Breakdown Structure (Gantt Charts)

Project planning or “Gantt” charts are part of the original proposal. They are far too detailed for publication here, but the reader needs to know that this level of management tool would be employed for effective tracking of project progress, if funding were sufficient to enable a fully integrated approach.

## SECTION VIII FRACTURE- FREE STORAGE

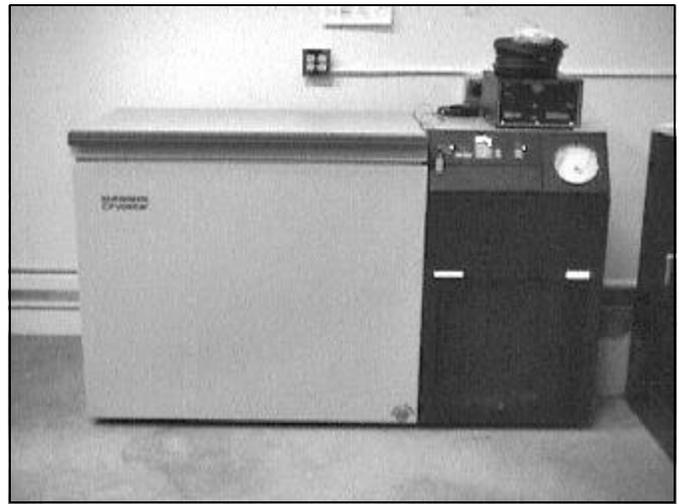
### Overview

Fracture-free storage denotes storage in which confidence is high that the temperature domain maintained will not lead to mechanical damage to a large, vitrified biological structure. This means that within the range of temperature variation, over the time periods concerned, one can be confident that the damage will not take place.

### Current Status

At this time, negotiations are underway with several different groups and organizations to pursue fracture-free storage under the Project, so it is inappropriate to publish the original proposal’s description and approach. However, if these negotiations do not lead to a successful start of efforts, future issues of *Cryonics* will include updated versions of the Project’s proposal to develop this essential aspect of the system for placing human beings into an optimal state of vitrification.

1



Cryostar Freezer; commercially available “starter” storage device for neuropatients at fracture-free temperatures

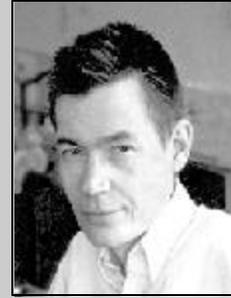


Liquid nitrogen backup controller for Cryostar Freezer

If you are interested in supporting this work with a donation, please contact Jerry Lemler, M.D., at:  
jlemler@alcor.org  
or  
480-905-1906 ext. 102

# Interview with Dr. Jerry Lemler, M.D.

by Mike Perry  
January 17, 2001



*As of early February 2001, Jerry B. Lemler, M.D., joined Alcor's staff as Medical Director and CryoTransport Manager.*



MP: Tell me about your background, when and where you were born, schooling, early occupations, and so forth.

JL: I was born in New York City, on Manhattan Island, on Guy Fawkes' Day, November 5, 1949.

MP: Guy Fawkes' Day ... I believe he led some kind of revolt about 1606 ...

JL: That's right, against the British Parliament, so every November 5 they hang him in effigy.

[Comment by MP: Fawkes, a Roman Catholic unhappy over repressive laws in Protestant England, was involved in the Gunpowder Plot to blow up King James I and the British parliament. The plot was discovered November 5, 1605, and Fawkes was executed by hanging the following year.]

MP: What about early schooling?

JL: I flunked out of high school, in New Rochelle, New York (I had to go back and take three courses over the summer), then did a few things like became a nightclub singer, ran a musical production company, then decided to get myself into college. I came south, and I did my undergraduate work at the University of Tennessee in Knoxville.

MP: What year was that?

JL: 1967, the summer of love.

MP: Oh yeah...what did you major in, in college What was your college major?

JL: I was a pre-med major with a specific interest in recent American history. Seems somewhat antithetical, I realize, but I was able to manage it, and don't regret it.

MP: Then you became an M.D.?

JL: Yes. I matriculated to, and graduated from the University of Tennessee College of Medicine in Memphis, Tennessee. That takes us into 1974.

MP: Can you say a little about your medical practice? What was your medical specialty?

JL: Following graduation I did a year of surgical internship, then I was an emergency room physician for awhile, in Dover, Delaware. Following that I served as a psychiatric resident at Norristown State Hospital in Norristown, Pennsylvania. (It's a suburb of Philadelphia.) Then for a little more than seven years I was in the private practice of psychiatry in Mobile, Alabama. Following that, for approximately four years I was the Chief of the Medical Staff of Lakeshore Mental Health Institute, a large state hospital in Knoxville, Tennessee. Following that I went into the field of forensic psychiatry and worked any number of assignments including capital murder and sexual harassment cases. I evaluated alleged murderers on death row, for the purpose of an insanity plea and/or a diminished capacity plea, working with defense attorneys—in Tennessee, Indiana, and Missouri.

MP: You started out as a surgeon and ended up a psychiatrist. I'm curious as to how that happened. Apparently you were interested in both fields.

JL: And still am—in spite of the fact that I've had a lot of analytic, Freudian-type training. I fully realize so much of what is theory, be it Freudian or otherwise, has already been and will

continue to be explained by hard-core science—biological, neurochemical, anatomical, physiological—or some combination of these elements. So the psyche and the soma, the duality, is very much fused in my mind and always has been.

MP: I'm not an expert in the field but it seems that they are making more and more discoveries about chemical effects on the brain, and some mental disorders might be explainable by these effects.

JL: Very much so, whether it's those that already have been, such as schizophrenia and manic-depressive disorder, or those that at the present time are not, such as homosexuality (though I don't consider that a disorder, just a genetic difference, though we don't know the details yet). Psychiatry as a field has damned too many individuals and their families to lifelong suffering and incredible guilt, based on marvelously spun and woven analytic theories about what causes paranoia, what causes depression, what causes homosexuality, only to find, unfortunately, much of the time after these folks were long dead and gone, that there was a biological substrate responsible for what they had said was bad child practices or faulty rearing, or whatever—and that's a shame.

MP: It certainly is. What year have we gotten up to now?

JL: I finished my residency training in 1984. I am a Board Certified Psychiatrist (national level; American Board of Psychiatry and Neurology). Then I moved to Mobile, Alabama, and my Lakeshore position, Chief of Staff there, I held from '91 to '95. I've concentrated on forensic psychiatry since that time, and the last several years I've also been the owner and manager of a series of weight loss and wellness clinics in Tennessee and Kentucky.

MP: Can you now talk about how you got interested in cryonics?

JL: Sure. I was browsing one day at a bookstore in Knoxville, in the science section, at which I pick up interesting titles from time to time, and on this occasion I pulled out a copy of *Engines of Creation* by Eric Drexler. I looked at the back cover, read a little in the store there, and thought, "Gee, that sounds kinda interesting." I took it home and two days later my life changed and a whole new world opened up. That was in late January or early February of last year, 2000.

MP: Then you ended up contacting us (Alcor).

JL: Well, I did, with some difficulty because Drexler's book was written back in 1986, and the phone numbers and addresses he had, particularly for Alcor, were no longer current. Actually my daughter Jessica, who is now an Alcor member too, was watching television one night, and saw, I believe the very end of the Immortality on Ice video that the Discovery Channel was telecasting. She caught the name Alcor, and I called the National Information Service. I found out that—yes, they were very much alive and well in Scottsdale, Arizona, and

that's when I made my initial contact.

MP: Then you proceeded quickly to signing up with us.

JL: We did, actually we became members on June 5, last year, my wife Paula and I, and Jessica followed a couple months later. Also at that time, in doing a voracious amount of reading, which I'm known to do from time to time, I suggested *Cryonics: Reaching for Tomorrow (CRFT)* might benefit from a rewrite. Fred and Linda Chamberlain agreed. I started working on that project, and went to Asilomar, which was incredibly invigorating. I cemented friendships and continued to work on the rewrite when I got a call one day in October from Fred, who was exploring the possibility of my coming to Arizona and joining the staff. I was just delighted, told him yes right then and there over the phone.

MP: Can you say a little about the work you expect to do here?

JL: I think I can break it down into two goals I particularly have. First and foremost is to build Alcor's cryotransport capabilities to the point where we are consistently able to deploy highly competent, professional rescue teams anywhere in the world we are needed with sufficient alacrity to meet whatever situation we are presented.

MP: I'm glad to hear you say, "anywhere in the world."

JL: Well, it's becoming that way, even notwithstanding the recent inquiries, it's becoming a global concept. It really should not have borders, and hopefully one day it won't. Also, another goal I would have is to swell the ranks of unapologetic immortalists, beyond the five hundred plus we have now, to where we have a very viable number.

MP: Yes. We also have more of a problem dealing with people in other countries now, and I think everybody would like to do something about that problem if they could, though it's a difficult one.

JL: It is, and of course we have changing governments, changing political structures, and a whole host of logistical, nightmarish events going on, but you know the world is becoming a much smaller place. With Internet capabilities we can communicate so much faster that old grudges might get ironed out a bit faster than they have in the past. At least we are afforded that opportunity. Whether we take advantage of it or not, we'll see.

MP: Can you comment a little more now on your second goal?

JL: Yes, to swell the ranks of what I call unapologetic immortalists. I'd really like to be on the forefront of building our membership. And I think having an M.D. as head of cryotransport is going to be a big plus in that regard. I've never been one to wear the M.D. degree on my sleeve, as they say. I don't have M.D. license plates, don't get a thrill from titles, but there are certain doors in the medical establishment that will open up to an M.D. I think we run a lesser risk of autopsy, and

we can expedite getting the human remains where they need to go. Also, I think another advantage I bring is that I'm a fairly mainstream, Board certified, AMA member, Tennessee Association Member, Southern Association Member. I've kept primarily to the mainstream of medicine; I'm not on the fringe, and I think that lends further credibility to biostasis and to Alcor in particular.

MP: Very good. How are preparations going for your move out here?

JL: Hectic as you might expect. Of course you know about Gizmo.

MP: Yeah, Gizmo [his cat, who stowed away on a moving van and arrived ahead of everybody else]. Well, we're certainly looking forward to your coming out here.

JL: Thank you, Mike.

MP: Thank you very much for the interview. Anything else you'd like to say?

JL: I didn't know whether you wanted any of the personal stuff.

MP: Sure, go ahead.

JL: Okay. I do a certain amount of traveling and writing. I'm a pilot, do a fair amount of flying, which I am curtailing because of biostasis. I guess one of my proudest achievements is that, for three days in January, 1989, I was the certified world record holder in the Nintendo game of Arkanoid. I'm married to the former Paula Hicks of Alcoa, Tennessee; we've been married for thirty years now. Paula is a former algebra teacher, fashion model, and building contractor. We have two children: Jessica, who'll also be moving to Scottsdale shortly after we do; and a son, Russell, who's a senior at the U.S. Military Academy at West Point. He's majoring in economics and minoring in nuclear engineering, so he's rather interested in the nanotechnology aspect of what we're doing. He's also a member of the Foresight Institute, as am I, a Senior Associate.

MP: Very good.

JL: Hobby-wise, besides traveling and writing, I'm interested in everything from German orchestral music to hard rock music. I attended Woodstock in 1994, and listen to everything from Gustav Mahler to Neil Young.

MP: Thank you, and I wish the best in coming out here.

JL: Thank you Mike, looking forward to seeing you again, and Gizmo too.

## We Need Your Financial Help

**Please support Dr. Lemler in taking Alcor's cryotransport capability to new heights in excellence!**

Alcor has put together a proposal for a 3-year crash program to pursue the development of whole-body vitrification. This is a major undertaking that goes beyond any project to date and will require substantial funding. How long it will take to pursue this goal is directly related to the financial support given by Alcor members. If you are interested in seeing this work pursued and would like to contribute toward funding this project, we will be happy to send you a copy of our detailed grant proposal. *(See pages 3-12 for a condensed version of the proposal.)*

### **Our Deepest Appreciation to the Florida Cryonics Association**

for supporting Alcor's efforts by pledging to support Dr. Lemler's salary for three years. This first contribution makes it possible to continue to pursue this effort.

For more information or for a copy of the proposal, please contact Dr. Lemler at 480-905-1906 x102 or by e-mail at [jlemmler@alcor.org](mailto:jlemmler@alcor.org)

# A Tribute to FM-2030

by Austin Esfandiary

FM-2030—is a gentle, loving, kind, warm, spirited, visionary, brilliant, funny, supportive, charismatic, character (although the word charismatic is an understatement in FM’s case).

FM fathered numerous social movements among them: Up-Wingers, Transhumanists, Extropians. He was also a strong contributing force to so many others. He was and is truly a man of his own words, a transhuman.

FM is transhuman, one of the reasons: FM is in cryonic suspension right now, awaiting the day when he will be re-animated and cured of disease.

In remembering FM let us always strive to live and inculcate his optimism, selflessness, warmth, love towards all living beings, and his view of the promises of tomorrow.

Look at some of FM’s writings and interviews, (some going back as far as the 70s). It is even that much more amazing if you realize what life was like then.

FM has been part of my life from the start.

I adored FM, which is saying a lot, for a kid who was very tough and judgmental about adults. FM made a huge impression on me, and he was delightful to spend time with. I readily embraced most of his “far out” ideas. My parents loved FM dearly, enjoyed the challenging conversations, but were concerned about his influence on me. Among the things FM would talk about: immortality, cryonics, fluid life-styles, and “mobiliias”—what people today call group houses. Many of my friends reside in them today.

I’ve come to find out the way FM had with kids. A friend recently confided that he hated school, and as a kid, really loved FM’s telling him not to worry about learning the old, primitive way, he could learn so many different ways, for example by traveling and doing the things he loved.

Another child of one of FM’s close friends legally adopted Esfandiary as her last name when she later became an adult and lost her parents.

His home, an apartment in Greenwich Village was magical, it was bohemian, yet not bohemian, earthy, luxurious in a comfortable, not showy way. Even the sodas FM had in his antiquated fridge (an unexpected charming discovery in futurist’s abode) were different, bitters instead of cola. There were fun games that were also mentally stimulating. I enjoyed playing them, and so did Mom.

FM, observing how much we enjoyed them, gave the games to us as gifts. As we traveled around the planet there were precious few belongings that we took with us, but those and additional games provided by FM went with us everywhere, and provided our family with untold hours of pleasure.

FM is such a raconteur. Fondly with humour, mischief, and love he would tell everyone entertaining stories about shared experiences from my childhood during many magical trips to East Hampton.

The trips to the Hamptons started in the 70s. I was attending Columbia, my parents had recently gone to Tehran where my father assumed his responsibilities as a top government official. A couple years later the Iranian revolution began to unfold.

My life was in incredible turmoil—it was the darkest point in my life for several reasons. It would have been completely and utterly untenable had it not been for FM, and our frequent trips to his home on the pond in East Hampton.

Those trips to the Hamptons provided an incredibly delightful and fun sanctuary from my troubles. I was guaranteed of a great time every time I went. The thing that appealed above all else was socializing with FM and his friends.

All of FM’s friends are amazing human beings, and I have always had this instant affinity and closeness to every single one of his friends... loved ones that FM considers his family.

FM often orchestrated communal cooking parties at his home—friends gathered and we all prepared the meal together. Those were the best of times. I still do that to this day with my friends, but not often enough.

When FM decided to move from New York to L.A. I went over one afternoon to help out. I thought I would be going to help him pack. Not so, he was giving away all his furniture and belongings. I was surprised, his belongings were very nice and in great shape so I asked him why he was doing that. He said that he had been in New York long enough, it was time for a change. He never wanted to get stale. That meant changing his surroundings completely. Having enjoyed his belongings with zest, now he would like nothing more than for his friends to also enjoy them. He did the same thing when departing L.A. for Miami.

I’d gone to New York frequently to spend a little more time with FM during his illness.

One night we were all eating together, FM, Flora, Fay, and Amir. I was seated next to FM, and when I saw a gnat, this tiny black spec in between our plates, I immediately went to remove it with my finger so it wouldn’t disturb our meal and our celebration. FM in his gentle, soft-spoken manner requested that I not harm the gnat. FM’s selfless caring and concern for all living things, despite his own predicament sent chills down my spine. It was as if that gnat sensed my intentions, and FM’s feelings, because it promptly took off, never to be seen again.

A friend of FM called me recently. We had never spoken before yet we spoke for a long time that passed too quickly. She was telling me how FM is omnipresent, and will always be! She is very excited about the latest genome decoding developments, and their implications for helping bring FM back to us. She also emphasized that FM has had such a profound, and meaningful impact on her life that he will always be a part of her life.

FM is many things to me, and in some ways a mystery that is still unfolding. I’m learning new characteristics and some of the things he has done to help others.

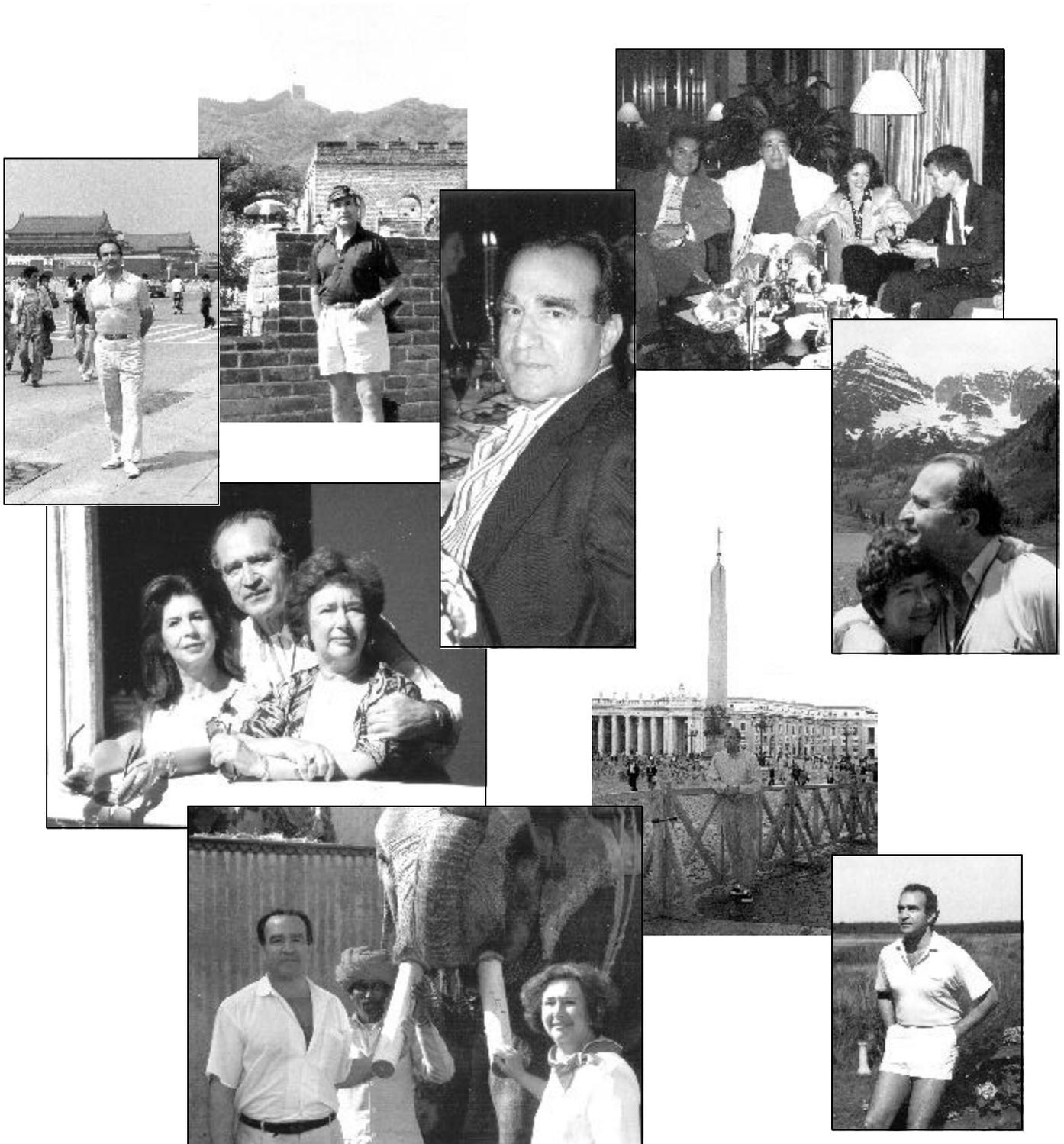
In closing, I have something very personal to share with you, and in return hope that you will take action.

FM, an optimist, has never ever expressed any fear of any kind, under any circumstance—with one very big exception.

He was in Florida several months ago, I had just called, and he told me he had been daydreaming about me, and was happy to hear from me. He then proceeded to tell me about this fear. A sacred fear, not about illness, disease, or pain. He expressed this enormous, almost tortured, concern and sorrow that when re-animated, he will have none of his friends and

loved ones around.

For our sakes, for FM's sake, I want all of us to be around with FM in the future. I want you to take responsibility for yourself, as well as your loved ones, and sign up for cryonics. Let us all be around together, for FM, for each other, for ourselves! Sign up today! 1



## FM & I

by Johnny Boston, January 2001

**“A cosmic upheaval is now surging on Planet Earth.  
We are at a major evolutionary milestone”**

*F.M. Esfandiary*

I met F.M. Esfandiary for the first time in 1979. I was nine years old. A bit of a rebel, I naturally found him to be a very unconventional, interesting sort of adult, as well as a warm and charismatic individual who understood my pre-adolescent mind and accepted me for what I was, a growing, confused young boy.

So strong of an impression he made on me, that by the time I was eleven years old, I had finished reading two of his books, *Optimism I* and *Tele-spheres*.

During our long walks around London, I had many opportunities to question him about various different issues. FM believed there was not just one way of learning, for school as an institution could not teach you all about the world and its many realities, and that sometimes reading and traveling could open one's mind more than lectures did. We also discussed a number of family issues, including the concept of ownership or belonging within the family nucleus, and how this was a breeding principle of neurosis.

At the age of thirteen, during a trip to the United States, I visited FM in his L.A. home. Our friendship had grown stronger by then, and he invited me to live with him for a while. I was thrilled by the offer. I would leave England behind me and start a new adventurous life in California, away from the conformities of a gray land. Of course I was not allowed, and my brave dream only came true seven years later. FM valued experimentation greatly as a necessary tool for the discovery of one's true self, and the future. He always supported my creative aspirations, and allowed me to come to terms and accept my indecisions. He believed that not knowing what path to follow could actually be the quickest way to finding one. He possessed a naturally philosophical outlook on life, for he, like all great men, understood that any given situation can be looked at from a myriad of standpoints. It was almost as if he were observing the world from a different dimension, a very special observation deck.

I never viewed FM as a mentor or a role model I actually liked him and respected him as a friend. He was also my confidant, a person to whom I could tell anything—without being judged. I was always fascinated by his great psychological insights in his writings, which are philosophically positive, but yet intellectually accessible.

Since a very early age I enjoyed futuristic literature, particularly the works of famous authors such as Isaac Asimov, and Aldous Huxley. Consequently I was prone to find similarities and differences between Aldous Huxley and FM. Both strived towards the advancement of human possibilities, but while there is no space for individuality in a Brave New World,

FM's concept of optimism thrives upon it.

We often spoke about movies, but his way of analyzing them was very peculiar. For example he did not usually enjoy violent films, but really liked Peter Sellers, and described the recent film: *American Beauty*, as a self-indulgent film dealing with unoriginal issues.

As I grew up, I challenged FM into more and more discussions. I used to interrogate him almost, for our conversations always stimulated me greatly, they made me think, and awoke the truth-seeking side of my personality.

He thought that human beings were becoming less and less violent. I did not understand this idea, for the last forty years appear to me as one of the bloodiest in human history. Although I still think this is true, FM presented me with an opposite and compelling response to my point of view. He believed the last forty years have also witnessed the growing phenomenon of human rights and peace movements. Our primitive instincts for killing are still present, but since the sixties, our sensibilities have evolved towards the creation of a more global and peaceful society.

FM was a purist in terms of science. He did not indulge in the concept of God or religion, while I was brought up within a somewhat traditional Jewish atmosphere, and have continuously questioned the role of faith within one's life. To me religion still holds the consolation of a peaceful transition between being and nothingness, an illusion of a reward that can sweeten our departure from the world, as we know it. On the other hand, the scientific solution seems to me still a bit harsh, for one either is a part of a bigger organism or dead matter. FM's belief in the possibilities of the future made the bleakness of science easier to swallow. He used to talk very passionately about the human genome project, and he was very optimistic of the fact that my generation would be able to achieve immortality. He thought the essence of who we are—is contained in the brain, not in the soul, hence his decision to be cryogenically preserved.

Near his death I saw him once or twice, he did not want to see anybody, he didn't like people to see him ill. That was also a very sad time for he genuinely believed he would still be around for the next thirty years. His disease angered him. Somehow technology could not catch up with this man's visions.

Like all great minds, he was a man considerably ahead of his time. A man with a name appropriate for a future society, when a concept of nationality is replaced by that of globalism. A man who once told me “If I wrote a best seller, I would be doing something wrong, and I would not be ahead of the game.” He wanted to be a catalyst not a savior, whose legacy are his books, the people he always helped, and his ideas.

FM was a very charismatic individual with a charitable and benevolent character—he was a visionary. We were like opposites sides of a coin, he loved life, I have always been a little more pessimistic. Our twenty-year long friendship was like a gift to me, I was blessed to meet him. 1

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*Alcor's Mission:  
The Preservation  
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# Alcor Update



## The Global Membership Challenge

by **Linda Chamberlain**  
**Executive Director**



**Is it possible to become a member of Alcor without living in the United States and being a U.S. citizen?**

Alcor's mission is the "Preservation of Individual Lives." As an organization offering a life-saving technology, we wish it were possible to make it available to all who are interested, no matter where they live.

Unfortunately, since Alcor is dedicated to offering only the most advanced technology possible this is not easy to do for two major reasons: (1) As technology advances, the delivery of highly technical biomedical services becomes increasingly sophisticated, requiring greater surgical skills and more advanced equipment and pharmaceuticals; and (2) the problems associated with funding mechanisms and dealing with a multitude of different legal systems are also very difficult to overcome without undermining long-term security for both Alcor and the patients in its care.



Technology is rapidly changing the face of our world. Biostasis, a very high-tech service, has grown out of what was once called "cryonics." In the 1970s and 1980s there was very little difference between organizations that offered cryonics services. In the decade of

the 90s, a broad gap began to develop between the technologies of those providers, however. Today, Alcor is the only organization that can offer vitrification, an advanced biostasis technology that is currently only available for neuro-patients (for whom current-day technologies such as stem cell technology, genetic engineering, therapeutic cloning, and future technologies like nanomedicine will be used to create younger, stronger, healthier, and more productive bodies).

Vitrification through the use of cryogenic temperatures is a way of turning a biological system into a glass-like state, rather than being filled with damaging ice crystals. The result is, as one would expect, far better preservation. Better preservation and less damage are of particular importance in preserving the physical structures that are associated with memory and identity. Alcor patients who receive this new cryovitrification procedure are likely to have more of their memory and identity preserved.

The unfortunate side of this issue is that highly skilled and trained medical personal must get to the patient rapidly. The longer the delay, the less likely it is that vitrification will be possible, due to the damage to the biological systems (the vascular and capillary beds) necessary to deliver the protective chemicals to the cells themselves. This greatly increases the importance of Alcor's standby procedures and skilled teams. It also means that the resulting time delays experienced when a member lives at a distance is a major limitation on the ability to make these advances available to those members.

For Alcor members who might need biostasis services while traveling abroad, Alcor works closely with Rowland Brothers International Mortuary Shipping, headquartered in London (with four generations of experience). Rowland

Brothers has a reputation for reliability and outstanding service that has been expressed to us by many sources including both international airlines and local morticians (whom we use to assist us with the legal forms and transport of our patients during remote operations). In addition to their worldwide reputation and network of agents familiar with the laws in all major countries, Tony Rowland, the head of Rowland Brothers has given Alcor exemplary cooperation and assistance.

Alcor's team and facility in England, with more than 15 certified Alcor CryoTransport Technicians, is at the doorstep of Europe and is expected to be our first line of defense in the event of any needs for Alcor members living or traveling there. However, *the ability to offer vitrification outside the United States will not be possible at this time, for many of the same reasons that vitrification is now only available for neuro-patients.* The scaling up of the equipment and procedures will require an extensive and expensive development program. Such capabilities must be developed first at home before we can tackle the challenge of making these available internationally. The great distances involved and obstacles such as laws, embassy rules, and airline schedules work against the need to act quickly.

Another problem is the difficulties of providing funding (since insurance is usually used). This problem relates to the fact that Alcor must have secure funding arrangements in order to carry out our primary responsibility: to *first* protect our patients already in biostasis (this applies to all conflicts of interest, such as the needs of a new member trying to make arrangements to become a biostasis member of Alcor).

In order to carry out our primary responsibility, Alcor must make sure that our long-term strength and stability as an organization is not jeopardized by the financial problems that would result from unfunded biostasis operations. Alcor is still too small an organization with too little financial strength to be able to write off 10% to 20% (or more) of its cash flow (like many large companies do, as a business judgement) and still remain solvent and secure for the long term.

Financial security leads to the need to make sure that members have secure funding mechanisms. This can present problems, of course, for persons who are trying to arrange membership. Such problems are often even more difficult for persons who do not live in the United States. *Until solutions can be found for this dilemma, Alcor cannot accept new members outside the United States unless they have American insurance or provide the funding in full, in US dollars, in advance.*

It is difficult to purchase insurance from a country where one is not a citizen. Almost universally, insurance companies require: (1) that the insured have either familial or business relationships that require they travel at least once or twice to the insurance company's country; (2) that all paperwork be signed while the insured is in the country where the insurance company is located; and (3) that the medical exam, blood tests, urine tests, etc. be done in the country where the insurance company is located.

This makes it difficult for a person to acquire an insurance policy in a country in which they do not have citizenship.

Many insurance agents (including those on our list of agents who write insurance policies in this country for the purpose of funding biostasis) have found that the difficulties are so extensive, that they are not willing to put in the time and effort in view of the low probability of success (as they are not compensated unless the policy is actually put in force). One insurance agent familiar with Alcor needs, and who is an Alcor member (Rudi Hoffman, see page 55), can help resolve these insurance problems.

Because of these difficulties, Alcor has made a policy that it will not accept an application fee and enter a person into the membership sign-up process until the funding has been arranged. The \$150 sign-up fee is good for 6 months. Thereafter, if the applicant has not finished the process, Alcor begins to bill the applicant \$25 per month to stay in the sign-up process. However, in view of the difficulties foreign individuals will meet when trying to obtain American insurance it is seldom possible for a person who does not live in the United States to complete this process in 6 months (unless they are paying cash). Knowing this, we do not feel it is ethical for us charge the sign-up fee unless the funding problem has already been resolved.

For that reason, Alcor does not enter a foreign individual into the sign-up process or charge the sign-up fee for individuals outside America until they have resolved the funding question. Upon request, we will forward one set of the legal paperwork that you will be required to sign (in triplicate, when the time comes) so that you can read these over and be aware of what you will be agreeing to.

### **What is the International Disclosure Form?**

Due to the problems described above, and to strive for good informed consent from a non-U.S. citizen who is interested in joining Alcor, we have a specifically drawn informed consent form that must be signed by foreign individuals in addition to our other legal paperwork (see next page).

### **Can a group of people set up a branch of Alcor outside the United States?**

Every decision made within Alcor will affect, either directly or indirectly, the long-term safety and security of the biostasis patients in Alcor's care. For that reason, all decisions made by Alcor personnel or directors must consider the impact on those patients and place their interests before all other considerations. Alcor cannot fulfill this mandate to the patients and at the same time accept the liabilities and problems that would be guaranteed if we set up affiliated groups in non-English speaking countries. With our current funding and personnel limitations, the only way Alcor can help groups in other countries is to offer consulting services to help them set up their own organizations.

(continued on page 37)

**INFORMED CONSENT FOR INDIVIDUALS RESIDING OR TRAVELING OUTSIDE OF THE  
UNITED STATES OF AMERICA**

(Revised November 2000)

**This Attachment is understood to be a part of the CONSENT FOR CRYONIC SUSPENSION signed by the Member on \_\_\_\_\_ (date and year) between \_\_\_\_\_ (Donor) and the Alcor Life Extension Foundation (Alcor).**

1. I understand and accept that cryonic suspension is not consistent with contemporary medical or mortuary practice. I understand that many physicians, cryobiologists, and scientists in other disciplines discount any reasonable possibility that cryonic suspension will be successful.
2. I understand and accept that the procedures used to place my remains into cryonic suspension are technically sophisticated procedures that require specially trained personnel, specialized equipment and pharmaceuticals, and are most beneficial if utilized as soon as possible after my heart stops beating (a condition known as "clinical death"). I understand that the difficulty of transporting a skilled team, pharmaceuticals and/or equipment outside the United States of America during an emergency, with little or no time to coordinate and arrange such in advance, could meet with legal delays and compromise the results of the procedure.
3. I understand that laws and customs vary from country to country. I agree and affirm that Alcor is not responsible for knowing the laws or customs in other countries, and is not responsible for social, legal, economic, and other problems that might make cryotransport, suspension, maintenance, or resuscitation of my human remains illegal or impractical. This is particularly true if I am traveling or residing outside the United States at the time of my cryotransport. The problems include, but are not limited to, the following:
  - 3.1 The forms that I have filled out with Alcor, which conform to the laws of the United States of America, to make possible my anatomical donation to Alcor, and therefore to make possible my cryonic suspension, may not be accepted or recognized by other countries.
  - 3.2 Alcor may not be able to gain access to my remains in a timely manner or at all.
  - 3.3 The inability of Alcor to place my remains into cryonic suspension without extended time delays could result in extensive biological compromise.
  - 3.4 The inability of Alcor to place my remains into cryonic suspension at all. Due to the possibility of events beyond Alcor's control, there are no guarantees that my human remains will ever be cryonically suspended or will be stored indefinitely if they are suspended.
4. I understand that it would be to my advantage to relocate near Alcor in the event of my physical decline, at my sole cost and responsibility, in order to avoid the problems outlined above.

**YOUR SIGNATURE BELOW CONFIRMS YOUR ACKNOWLEDGEMENT THAT:**

1. You have read, understood, and consented to all of the provisions of the CONSENT FOR CRYONIC SUSPENSION to which this is attached.
2. You are fully aware of and accept the risks and limitations explained in this Addendum: Informed Consent for Individuals Residing or Traveling Outside of the United States of America.
3. These limitations and risks have been satisfactorily explained to you by the officers, representatives, and/or other personnel of Alcor.
4. You declare that the arrangements described herein, in conjunction with *the Cryonic Suspension Agreement* and the *Authorization of Anatomical Donation*, constitutes your last wish as to the disposition of your human remains after legal death.

\_\_\_\_\_  
Signature of Member

However, the ability to offer vitrification outside the United States will not be possible at this time, for many of the same reasons that vitrification is now only available for neuro patients. The scaling up of the equipment and procedures will require an extensive and expensive developmental program. Such capabilities must be developed first at home before we can tackle the challenge of making these available internationally.

Two (2) witnesses are required to sign in the presence of each other and the Member. At the time of signing, witnesses must not be relatives of the Member, health care providers of any kind, or officers, directors, or agents of Alcor.

**YOUR SIGNATURE AS WITNESS CONFIRMS YOUR ACKNOWLEDGEMENT THAT:**

1. The Donor \_\_\_\_\_ has represented to you that Donor understands and agrees to the purposes and terms of this **ATTACHMENT A: INFORMED CONSENT FOR INDIVIDUALS RESIDING OR TRAVELING OUTSIDE OF THE UNITED STATES OF AMERICA**
2. The Donor has declared to you that cryonic suspension is Donor's last wish as to the disposition of Donor's body and person after legal death.

WITNESSED THIS DATE \_\_\_\_\_ TIME \_\_\_\_\_ (a.m./p.m.)

# President's Report

by Fred Chamberlain

President/CEO, Alcor



## Two Neurovitrification Cases

Since the last Alcor Board Meeting on 11/5/2000, two Alcor members have been placed in cryostasis. Both had arrangements for neuropreservation, and the procedures used were oriented toward neurovitrification. Preliminary reports were circulated by e-mail and posted on CryoNet. Despite adverse circumstances in each case, target levels for cryoprotection were reached, at least to the extent that was reasonable to expect considering the initial conditions of the patients. This was extraordinary in view of the delays in starting the procedures, which in one case was more than thirty hours due to difficulties in obtaining plane transport from the East Coast.

These were both, in different ways, "head injury" cases. The first member-patient was in his 90s and had experienced a massive stroke several weeks earlier. He had survived this, but had not recovered, and was readmitted to a hospital with breathing problems related to pneumonia. No funded standby was provided, and Alcor first learned of his cardiac arrest from personnel in the hospital who were aware of his arrangements. In fact, first notification as to his being admitted to the hospital was a direct consequence of his wearing his bracelet. Extrication from California was impeded by bureaucratic obstacles, but administration of heparin was prompt, along with cooling, thanks to the actions of Bob Newport, M.D., who phoned the hospital and obtained this level of cooperation.

The second member-patient was a woman in her mid 40s, walking her dog along an icy road, who was struck by a skidding pickup truck. Basal skull fractures were part of the cause of death. The accident took place immediately in front of her house and her husband, also an Alcor member, was at her side almost immediately. The coroner arrived a few minutes later (it was a small town, and both husband and wife were well known to be Alcor members). By then, Alcor had been contacted and had placed Jerry Lemler, M.D., in touch with the husband, who was able to hand the coroner a cell phone as he stepped out of his car to speak immediately to an Alcor M.D. According to the husband, this no doubt made a tremendous difference in the ease with which autopsy was avoided and hospital cooperation was obtained. (Heparin was administered promptly, upon Dr. Lemler's instructions.) Full technical reports of the cases will be published as soon as data can be compiled and the reports finalized.

## New Member of the Alcor Staff; Jerry Lemler, M.D.

As of early February, Alcor's staff was expanded by the addition of a permanent, full-time physician, assuming the role

of CryoTransport Manager and performing all of the appropriate supervisory duties, including organizing and training rescue teams, supervising upgrades of field equipment and operating room capabilities as these develop, and being responsible for the maintenance of all protocols as they evolve. More fundamentally, Dr. Lemler will be starting the development of a fully professional cryotransport team, which will expand later to include paramedic personnel.

The funding for Dr. Lemler was provided by Florida Cryonics Association (FCA), by way of a grant to Alcor, nearly \$100,000/year, which is expected to increase with time as more personnel are added and salary levels rise. Thus, this change does not reflect a shift of budget within Alcor. Rather, it is the result of a very-large-scale proposal that was presented to the principals of FCA during December. FCA's response, in supporting the gradual buildup of personnel, marks the beginning of a new philosophy in cryotransport rescue, "top-down" development of the kind of rescue team that has been discussed for years. When funds become available for operation of BioTransport, Inc., as a separate rescue contractor, Dr. Lemler is expected to be the logical leader for this enterprise.

## Pricing and Standardization of Neurovitrification Arrangements

Several Alcor members reviewed the large-scale proposal (see page 3) for development of whole-body vitrification over the next three years, and asked, "What would it cost to implement" storage for neuropatients, near-term, at "fracture-free" temperatures? An initial analysis indicates that this could be started up with initial project funding of about \$200,000 and would permit Alcor to make such storage a standard part of its services, with only modest price increases to those who join Alcor in the future (and grandfathering existing members).

The final numbers have yet to be worked out, but many Alcor members would like to see this development take place, and if Alcor took this approach, it might even further accelerate the growth of membership. Especially if a "grace period" were provided for those about to sign up or in the sign-up process, to complete their arrangements, it could produce a near-term added surge of new members. After this period elapsed, new members would make their arrangements with additional funding, but the overall growth of membership might continue at favorable rates or even accelerate, if it were standard practice to use vitrification protocols with neuropatients and store at fracture-free temperatures.

Those interested in supporting this work should contact

Alcor's Medical Director, Dr. Lemler, at [jlemler@alcor.org](mailto:jlemler@alcor.org) or 480-905-1906 ext. 102.

### Other Details

#### *The TimeShip.*

This project continues its studies, and a group of the core planners visited Alcor during December and participated in two days of talks concerning how this project might be developed. Hugh Hixon and Mathew Sullivan participated in these talks, as well as Linda Chamberlain and I, broadening Alcor's influence.

1. At this time, Alcor is the most plausible "anchor tenant," and many of the questions revolved around what level of confidence Alcor would have to have to place its patients in such a facility. These were very delicate questions, and naturally no commitments have been given. At some time in the very near future, some of the questions may have to be addressed by Alcor's Board and Advisors.

2. There is every indication that this structure will be funded and erected, but (at the same time) Alcor cannot commit its patient storage to anything that does not meet the highest standards for reliability and accountability. Based on past experience, Alcor is never expected to turn over the direct responsibility for care of its patients to an outside organization, unless it has total control of such an organization.

#### *LEF-Sponsored Mailing.*

A large mailing paid for by the Life Extension Foundation (LEF) was centered around a letter from Alcor, to those who have inquired about Alcor's program over the past 10 years. The letter promoted membership, which in turn sells nutritional supplements, but the benefits to Alcor were:

1. More than ten thousand past inquiries to Alcor received a mailing on the Alcor letterhead, with its Medical and Scientific Advisory Boards on the masthead, along with enough information to invite phone calls and/or visits to our website, and

2. A portion (5%) of the membership fees and product purchases by any of those who join LEF as a result of this mailing will go to Alcor, in compensation for use of the inquiry list. The expectation is that this will help Alcor to better fund its operations, with less reliance on donations, endowment funds, or other such sources.



#### *Holiday Season Festivities.*

CryoFeasts were held in three different locations (Arizona, northern California, and southern California). Particularly noteworthy was a new location for CryoFeasts in southern California, the home of Dave Kekich in Palos Verdes Estates. Dave, a long-time Alcor member from Johnstown, Pennsylvania, recently moved to southern California and is at work establishing a number of life extension ventures at his new location.

1

#### *A4M Conference Exposure.*

A very strong team was present to discuss vitrification with the attendees. Although the booth was shared by Alcor and Cells4Life, Inc., it is interesting to note that all of the Alcor members who participated on the Alcor side of the booth were also Directors of Cells4Life, Inc., with the exception of one, who was directly of BioTransport, Inc. Inasmuch as (presently) BioTransport, Inc., is the sole shareholder of Cells4Life, this is a strong indication of how much support exists on a personal level, between Alcor and those who are involved in these two other corporations.



## Transitions and New Developments

By Fred Chamberlain, CEO, Cells4Life, Inc.

### Changes in Alcor

In a few months, as offshoots of Alcor's programs to expand and diversify, I will be resigning as Alcor's President, recommending that its Board of Directors elect Linda Chamberlain to fill that role. Assuming they do, you'll be in good hands! Linda was Alcor's first President in 1972, and over the past four years she has managed its two most demanding areas of responsibility, those of the CryoTransport Manager and Membership Administrator. In both areas, Linda has vastly upgraded how Alcor operates. I expect, if elected, to serve as a Director of Alcor, and (of course) I'll be there for Linda in any way that she needs, both personally and professionally.

### Changes in BioTransport and Effects on Alcor

BioTransport, Inc., now has the prospect of deriving income for development and operations through a new subsidiary, Cells4Life, Inc. This is expected to increasingly enable BioTransport to assume Alcor's rescue responsibilities. As this takes place, Alcor's "overhead" will go down; more dues and donations can then be devoted to public education, research, and membership growth activities. When Alcor finally turns over its rescue responsibilities to BioTransport, Inc., as a "prime contractor," Alcor is expected to acquire financial interests in both BioTransport and Cells4Life, enabling it to even more effectively pursue tax-exempt activities and build membership.

As part of this transition, I will also be resigning as President of BioTransport, Inc., recommending that Jerry Lemler, M.D., be elected to that role. This will fit well with Jerry's new responsibilities as Alcor's new CryoTransport Manager and help him with moving the rescue responsibilities from Alcor to BioTransport over the next few years. In the immediate future, as you can gather from other announcements in this issue, Jerry Lemler's efforts will be going into building a fully professional cryotransport team, with the strong support of the Florida Cryonics Association and other donations by Alcor members. By the time BioTransport, Inc., takes on contract responsibilities for "full service" operations, the outlook is that income from Cells4Life will be covering any of the additional shortfalls and development costs for new technology.

### Cells4Life, Inc.

Cells4Life, Inc., was recently established as part of a "redirection" of the development of BioTransport, Inc. Originally, BioTransport's plan was to raise capital for the service of "last-minute" cases, as described elsewhere in this issue. This was a plan that depended on the solution of many challenging problems of informed consent, rapid financing of biostasis services, and resolution of other problems. Those problems proved more difficult than originally anticipated, and many of the issues discussed in the article on last-minute cases

were first explored during BioTransport's studies of the feasibility of developing a business based on such cases.

The initial goals of BioTransport's business were not set arbitrarily. They were chosen to deal with the problem that infrequent cases lead to: (1) teams that do not acquire a useful level of experience; and (2) failures to benefit from economies of scale. More simply, it is neither technically or economically practical to develop and maintain good rescue teams without a reasonably high rate of cryotransport operations. Alcor permitted and supported the formation of BioTransport, Inc., to make a reality of well-trained teams equipped with high technology, on a financially feasible basis. At the time BioTransport's initial plan was formulated, this seemed the only viable option.

Once it was clear that "commercial" cryotransport operations were not going to be a practical objective, the alternatives were to: (1) expend BioTransport's remaining resources on developing better rescue teams, but without any prospect of them breaking even; or (2) pursue a dual pathway of upgrading technology, while simultaneously going in a direction with more promise of financial feasibility, but something closely enough allied to the goals of cryotransport to be compatible. The outcome was Cells4Life, Inc. It is being developed as a subsidiary, soon to be an independent corporation, so that: (1) possible loss of control to investors would not jeopardize BioTransport as a dedicated cryotransport service contractor; and (2) BioTransport would be insulated from any liabilities that might develop from the Cells4Life, Inc., side.

Last August, as some readers of *Cryonics* will recall, an offer was made to culture viable cells for Alcor members. More than 40 Alcor members have thus far subscribed, for more than 60 total samples (including family members and pets). By the timetable, we were supposed to begin operations on the first of February but have been delayed by late deliveries of equipment and other organizational obstacles. Nonetheless, cells have been in culture in our lab now for more than two months, and our shakedown operations are close to complete. Soon, we should have finalized service agreements out to those who have signed up for the service, with instructions on how to select physicians from our list or put us in touch with their own.

The Cells4Life, Inc., web site at <http://www.cells4life.net> is still in the early stages of development, but it will give you a good picture of where we are headed. Reading over the part concerning how Cells4Life originated in particular should help you see the potential of "catching the wave" of demand for this type of service, which promises to expand very quickly over the next few years. In fact, if we were to hesitate at all in pursuing this course of development, there is a sense that we would be missing the peak of what could be a very large opportunity.

There are two tie-ins with Alcor, which are of interest. The first is that Cells4Life is obligated to pay 5% of its revenues (sales) to BioTransport. This is a form of "royalty," vs. dividends on shares. It means that BioTransport will receive 1/20 of every dollar that comes in the door, before expenses. From the start, this will provide a flow of support to build a stronger rescue capability for Alcor through BioTransport.

The second tie-in is in connection with viable cell

culturing of tissues from Alcor patients. In the future, each patient that Alcor places into biostasis can be evaluated by culturing of cells from multiple points, after cryoprotection and cryopreservation by means of the best protocols we are using. For example, in Alcor's most recent suspension, tissue samples were taken after the vitrification procedure and cooled rapidly, for the same type protection as the patient herself. Evaluation of these samples will give at least an initial assessment of the state of the patient's cells, taking into account all of the steps of the transport and central laboratory operations.

The captioned pictures you see below are of our "pilot laboratory" in space subleased from Alcor. As Cells4Life expands into larger quarters, after raising capital for expansion, we will report on them for you in future issues of *Cryonics*. When Cells4Life has worked out its future plans for developing and offering services in the way of pet cloning, cell therapies, and tissue engineering, Alcor members will be among the first to learn about what is happening.

Many Alcor members have asked if Cells4Life might offer discounted services again, once it is in full operation, since many Alcor members did not subscribe on the initial discount offering last fall. The answer is that this is definitely planned, and the details on this offer should be in the next issue of *Cryonics*. Of even more interest might be that Cells4Life will propose a special program for Alcor members that would permit them to first subscribe to viable cell culture and preservation by Cells4Life but then place half or all of their viable cells in perpetual storage with Alcor as anatomical donations, as adjuncts to tissue growth for reanimation or other uses associated with life extension. Even those who store cells with Cells4Life with pet cloning in mind might want to have some of those cells stored with Alcor, against the possibility that they might be suspended before cloning of their pet became practical, or they might want this option "at the other end," long after a pet cloned today might have died of old age.

There are endless possibilities. Cells4Life will be exploring them! 1

Here, tissue fragments are immersed in flasks of nutrient media and incubated for 3 to 4 weeks. Microscopic examinations are performed periodically to verify freedom from fungal and bacterial infestation. The cells divide toward a goal of 4,000,000 viable cells. Then they are collected by centrifuging, transferred to four vials, cryoprotected, and cooled to cryogenic temperatures.



Cryocentrifuge for "capturing" cells after culturing



Cell culture and cryoprotection workstation



Cryoprotection of cells by Dale Howell, Laboratory Director, just before cooldown



Liquid nitrogen dewars R2D3 and R2D4



Incubator with human and pet cells in media flasks



Microscopy and digital photography system



Cells4Life's Food4Cells ("culture media")

**To Alcor Directors, Advisors, and Staff  
From Steve Bridge  
January 12, 2001**

At the Alcor Board meeting of Sunday, January 14, 2001, I resigned my positions as Alcor Director, Alcor Vice-President, and Chairman of the Board. I have already had a couple of people ask me if this was part of some disagreement on the Board.

The answer is “No.” With new suspension technologies finally coming online, this is an exciting time in cryonics, and I would love to be part of the next leap forward. This move had been planned by me many months ago, and Alcor’s Board had plenty of advance notice. I will still be acting as a Board Advisor and will be available for consultation with Alcor President Fred Chamberlain and other Alcor staff and Directors.

When I left my position as Alcor’s President in January, 1997, I moved back to Indianapolis, Indiana. Several months later I married a long-time friend (widowed) with three children. A year ago December, we adopted a beautiful, lively little girl from Vietnam. She is now a little over two years old, and she is cuter and more interesting than any cryonicists I know. While my 21-year-old stepdaughter and 18-year-old stepson are comparatively low maintenance, my 9-year-old stepson and 2-year-old daughter are not. This is a time in my life to devote the majority of my energy to my family.

I have been involved in cryonics since 1977, generally up to my neck. I’ve been on Alcor’s Board since 1992, which put it up to my ears, and I was Alcor’s President from January 1993 to January 1997—which meant cryonics was piled WAY over my head. I can’t count the hours I’ve devoted to this quest over the past decade; but I no longer have the time or excess energy to participate in the amount Alcor’s Board requires. Heck, I haven’t even read CryoNet since November, and I’ve been on it from nearly the beginning. I think this last 8 1/2 years gives me plenty of reason for a break.

I will continue to update my cryonics listings on the Open Directory Project at: <http://dmoz.org/Science/Biology/Cryobiology/Cryonics/>. If you have new sites for me, please let me know directly, in case I don’t get caught up on reading CryoNet.

This isn’t the end of cryonics activism for me, I’m sure. I’ll be back in there again someday. Until then, I wish you each a long life and a cool head.

Steve Bridge



“During one of its more trying eras, Steve Bridge brought to Alcor a level of diplomacy without which Alcor probably could not have survived. Steve contributed heavily to Alcor’s formative years as well. One of Alcor’s greatest strengths results from the broad base of talented individuals that have contributed to building the mechanisms that have produced the reputation for excellence and security that Alcor has earned over the last 30 years. Among Steve’s many important contributions to Alcor’s current strength include many years of editing *Cryonics* magazine (both in Indiana and after he became part of the full-time staff at Alcor), his numerous thoughtful articles over the years, and his major effort in developing the now irrevocable Patient Care Trust. To give a complete list of the valuable contributions made by Steve Bridge would require an entire issue of this magazine. Alcor is grateful for his past contributions, accepts that we all need to focus on our own personal lives from time to time, and will always welcome his efforts on any level that he provides them.”

—Linda and Fred Chamberlain

“Organizationally, Steve brought purpose, rationality, intelligence, perseverance, sensibility, honesty, and compassion. To the public, he brought the face of ‘everyman’... a working guy with a family, trying to do his best. If that combination can’t promote cryonics, nothing will.”

—Michael Riskin, CPA, PhD, Alcor Director and Treasurer

# “Last-Minute” Calls

by Fred Chamberlain  
President/CEO, Alcor



## Example

In the movie *The Poseidon Adventure*, an ocean liner turns upside down. Many passengers find themselves in the main ballroom, *standing on the ceiling*. A few, seeing that the surface of the ocean must be toward the hull of the ship, above them, erect a makeshift ladder to go “up” towards the *bottom* of the ship. This seems “down” to the rest, who cannot understand that the bottom of the ship is now above the waterline.

Most are skeptical, and are reassured by others that there is no use in climbing the shaky “ladder” (the ballroom’s Christmas tree had been propped against the wall to reach an upside-down doorway earlier at the *lower* level of the ballroom, now at the *top*.) A few climb the ladder and encourage others to join them. Only a few do this.

Suddenly, water rushes into the ballroom. Those who were skeptical just a few moments ago now frantically try to climb the flimsy tree, not one at a time, but all at once. It collapses. The few who do reach the upper level continue to climb, facing many additional difficulties. Some are lost along the way, but they push on. As the movie ends, those who make it “up” to the *bottom* of the ship find that a helicopter has landed on the hull, and the crew cuts an escape hatch for the survivors to exit.

## Comparison

The parallels are not exact, but close. Increasingly, Alcor is called by people who have been looking at the Alcor web site for months. Often, they have called and have received sign-up packages. Some are part way through the sign-up process. Suddenly, surgery is needed urgently! Or, terminal cancer takes them into hospice. Or, they suffer strokes and their relatives call. Sometimes, the call comes from an emergency room or mortuary where the nonmember is already dead.

Almost always, the request is for Alcor to deploy a standby team immediately. We are assured that “the funding is there,” and “everyone in the family wants and supports this choice.” To the caller, it seems so simple. Why can’t Alcor’s staff, consulting physicians, and rescue team members drop everything else and “make it work” for them? Why can’t we, even while the family is still deciding if this is the right choice, get in touch with the coroner or medical examiner in their city? Why can’t we locate and retain a mortician, check on the plane

routing that would be used to deploy a team, and verify that Alcor’s operating room and cooldown facilities would be usable in a few hours, in case they were to decide to go ahead? They ask, “Why is this so difficult to make happen at the ‘last minute?’”

Any suspension requires three things: (1) the will to make it happen; (2) the legal authority; and (3) sufficient financial resources. If last-minute callers were, in most cases, really committed and prepared to proceed, Alcor might have reason to be prepared for such cases. The reality is that almost always, once the caller learns about the technical uncertainties and logistic difficulties, one of those three requirements is lacking.

In recent years, no matter how vigorously Alcor has attempted to cooperate and be prepared to “be there” in last-minute cases, for those who never contacted us before, nothing has come of it; no attempts to save a life have resulted. Alcor’s meager resources and its preparedness to serve our existing members, however, have been depleted. Our present rescue capabilities are less than they might have been otherwise. First priority now is increasingly reserved for Alcor’s existing members. Our present policies directly reflect practical experience.

## Liabilities

Last-minute cases require Alcor to accept the dangers and liabilities of potentially hostile relatives and legal complications of wills and trusts that may specify burial or cremation or make funding impractical. There also are problems of acceptable disclosures and informed consent. Callers often tell us that the people they want placed in biostasis are “coming and going,” hovering on the brink of consciousness. “But,” they assure us, “he (or she) can still *sign the papers*, and all of us know they always wanted it!” We explain that this is not the same as a deliberate choice on their part. Such people are in no condition to “sign up” as Alcor members, in the usual way.

The alternative, we have to tell them, is that they must arrange for the prearranged “whole-body anatomical donation” of the intended Alcor member, by a person’s spouse, children, or parents. We point out a high probability of claims, later, that the relatives acted from panic or grief, with insufficient understanding of the difficulties and uncertainties!

## The Message, for Readers of *Cryonics*

Many of you reading this article are wearing Alcor bracelets on your wrists or on neck loops. You are already “members of the Alcor family.” We are here for you, day and night, always. If you have standby arrangements, you know that we can “scramble” a team immediately if your life is in danger. With a full-time physician now on board at Alcor, even if you do not have standby arrangements, we can convey an understanding of what might make your initial transport, by getting in touch with emergency room doctors, medical examiners, and others who may influence how quickly you arrive at Alcor, and whether you receive medications and cooling immediately after death.

*Others* of you are *not* signed up, still *thinking it over*, or you *are* in the sign-up process and it is dragging out because of other commitments, or perhaps you *are* signed up but have *others* you would like to “bring along!” There may be problems with how much it costs, or technical questions you feel you must resolve first, or any number of other things that seem to stand in the way. In all such cases, these issues may seem to be clear-cut and reasonable, and we at Alcor follow the practice of *never* rushing anyone to complete the sign-up process, but there is one thing not to forget.

*“Those who know about Alcor’s program and have not yet signed up for it have effectively chosen (for the time being), not to be placed in a state of biostasis by Alcor, if they die.”*

In legal terms, failing to sign up or complete the sign-up process is an “act of omission.” Nicer ways of saying it are “procrastination” or “indecision.” In end, the result is the same. Seat belts only *work* if they’re *worn*!

## Motivation for this Article

The purpose of this article is *not* to speed up Alcor’s membership growth. Its only goal is to help you be sure that whatever choices *you* make are choices *you* are prepared to “live with.” I’ve experienced this. Keeping this to myself, rather than sharing it with you, would also be an act of omission. This article sets that straight.

My full realization of the need for advance biostasis arrangements came late in 1969. It was an abrupt and painful awakening. I had known about cryonics for more than five years, subscribing to newsletters and magazines on it. I’d even written letters to relatives of mine with terminal illnesses, advising them to *check it out!* Had *I* checked it out? No! As you might expect (this point of view is common *still today*), I thought that nothing was going to happen to *me*, or anyone really *close* to me, anytime soon.

Then, one afternoon, my phone at work rang (JPL, southern California). My (former) wife said, “Fred, you’ve got to come home *right away!*” Her voice was breaking, out of control; I lived only five minutes away. Had one of the kids drowned in the pool? Was it our little black dog, Muffy? My wife couldn’t speak coherently. I rushed home.

On arrival, I found that my mother, vacationing over the holidays in Florida, had just “died!” She had driven there from Virginia with my father, a helpless stroke victim whom she cared for by herself, to an area they had lived earlier, to spend

Christmas with friends. As it turned out later, Hong Kong flu had invaded her cardiac muscles. My mother, who always said “she’d never had a sick day in her life,” had truly been sick. On the morning she was supposed to see a doctor, after straightening up the little apartment they’d rented for a month, she apparently walked out to check the mailbox at the street. Neighbors soon “found her in the driveway!” Many hours had passed, before I knew.

In a flash, all of the possible obstacles came home to me. My mother’s will called for cremation. She had been taken to a mortuary; perhaps she was already embalmed. My father was “temporarily with the friends”; I’d have to see to his needs quickly, as well as clear out possessions from the rental unit and take care of the longer-term aspects of her estate. My father’s care posed dilemmas, and my wife was tired of having her “crazy cryonicist” husband create negative overtones in the family relationships. The cryonics organizations of 1969 were basically “discussion groups.”

This was four days before Christmas. On the plane to Florida, my sense of loss was terrible. It grew worse over the next few months, and only improved after I became a cryonics activist. By the time my father died of terminal pneumonia in 1976, Alcor had been in operation for more than four years. He was its first “patient.” Did that soften the blow of my mother’s loss? No! Assuming my father made it to the future, one of his first experiences would be the anguish that *she* did not make the trip. Could I go back and change the past? No! We can only go forward!

You must make your *own* choices. So must all of the *other* people you would like to take with you into the future. *But*, if you can’t make arrangements or persuade others to do so in advance, when things are calm, your chances of doing something about this once your world starts to fall apart are very thin. Think about this carefully; know where you stand; do what you can within reasonable limits; then be prepared to accept whatever comes. That’s the best you can do. That’s all *any* of us can do.

## The New “URGENT OR EMERGENCY INQUIRIES” Message on Alcor’s Web site

[On the entry page of Alcor’s web site (<http://www.alcor.org>), there is now a link for “URGENT OR EMERGENCY INQUIRIES.” It takes you to an entry message, and then to a detailed discussion of what arrangements for a “last-minute” case require.]

## URGENT OR EMERGENCY INQUIRIES

This material is *not* for the purpose of encouraging last-minute cases. Our hope is that it will give “non-emergency” visitors a realistic picture of the difficulties, so that they can give more balanced consideration to joining, or not, at the outset. For those who are in urgent or emergency situations, the goal is to prevent unrealistic hopes. In that sense, all of the material in this section of Alcor’s web site is “educational.”

One last thought on last-minute cases. *A* wants to be signed up and is; *B* does not want to be signed up and isn’t; *C*

can't decide or doesn't have time to work it out. *A* has made a decision, and knows what to expect. *B* is in the same situation. *C* is like a person with one foot on the dock, and one foot on the boat, as the boat pulls out from the pier. Which of the three are you most like? *A*, *B*, or *C*?

### Content from Alcor's Web site

Below are excerpts from Alcor's web site section on "Urgent or Emergency Inquiries." Publication here is intended to make these ideas accessible to those who do not have web access, and to make it easier to share these ideas with others.

(Linked from Entry Page: <http://www.alcor.org/Urgentxx.html>)

### "LAST-MINUTE" CALLS! THE SAD REALITY IS THAT THEY JUST DON'T WORK!

Alcor receives calls each month from terminal patients, their relatives, close friends or others who thought it couldn't happen to them or theirs, at least not now. But sometimes it is now—that lump turned out to be cancer, that chest pain was followed too swiftly by a heart attack, or unexpected and risky surgery is needed immediately. Sometimes it is even a person already in the Alcor sign-up process, or a relative of an Alcor member who is already signed up.

The fact is that making arrangements with Alcor takes time.

Alcor's program is not geared to hastily briefing people, their relatives, attorneys, and all of the public officials whose cooperation might be needed; going through several months of administrative and financial arrangements in a few hours; and then arranging for a standby team to be flown into position at some remote location on a moment's notice, there to wait days or weeks (at considerable expense) until needed. Under the stress of an impending death or a life threatening operation, too often with the person concerned already in a coma or legally dead, sound arrangements are virtually impossible.

If you are in such a situation, the chances are that you will have to follow in the footsteps of others who came to Alcor too late and found that there was no way to make the details come together at the last moment.

My mother died in 1969 and was not placed in cryostasis, even though I had known about it for more than five years. When my father died, in 1976, he had been a member of Alcor for four years, and did not "miss the boat." I still feel the pain of my mother's loss; all I can do is share my experience with you, and hope that you are not reading these words under the pressures of a desperate situation.

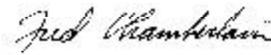
Perhaps you are reading this because you are uncertain about whether or not to sign up. Perhaps you think you don't have to make arrangements now, that when the time comes the doctor will say "...and check here if you'd like biostasis at Alcor." It doesn't work that way. At this time, in this society, if you haven't made other arrangements in advance—you will die. So act now, before the need is upon you. It will be a lot easier on everyone.

We at Alcor never want to see anyone desperately trying to make arrangements at the last moment. Biostasis is a personal, relatively expensive, uncertain choice, and we believe it should be approached thoughtfully — not under the intense pressure of a looming deadline.

Entering the sign-up process at Alcor costs \$150 and provides six months of information and publications. After that, you can continue in an active sign-up process for \$25 per month until arrangements are complete. Some people spend years at this. One of them recently "died in the process" and was not placed in cryostasis. The degree of urgency is up to each prospective member.

Those who arrive on Alcor's doorstep at the last moment almost always find they have chosen, by their procrastination, not to join Alcor or any other organization. We wish there were some way to make this easier, and less painful.

But there isn't.



President, Alcor Life Extension Foundation, 1/22/2001

\* \* \*

(A further link on the web site now takes you on to: <http://www.alcor.org/Urgent01.html>. For current information, please do not rely on what is printed below; it is recommended that you go to the web site itself; the links will be easy to follow!)

### DESIGN OF ALCOR'S PROGRAM

Alcor's program is oriented toward farsighted individuals who become intrigued with the concept of cryotransport and investigate it in depth. They understand that we cannot yet demonstrate that memory and identity can be recovered, from the states of preservation we presently can achieve.

After considering the many diverse aspects of cryotransport, including possible difficulties of adjusting to the future, our members decide that this is a sensible option for them, should their lives be endangered. They are usually under no pressure from a medical crisis, at the time they join.

Alcor is a membership organization designed to allow members to make arrangements well in advance of need. Cryotransport is not something that can easily be decided upon or arranged for at the last minute. A great deal of planning is required. This takes time and can be costly. It is not something to wait to organize until you have only a few weeks of life remaining.

As a general rule we advise people that only if a person is expected to live at least 30 days will there be time to handle the funding, informed consent, legal paperwork, etc. When persons have only days left to live, courts may not consider them competent to make the kind of informed consent required to sign the Alcor legal paperwork.

### INQUIRIES ON AN "URGENT" BASIS

Sometimes Alcor is contacted on an urgent basis by those in imminent danger of loss of life, or by their friends or relatives, who in many cases have little or no knowledge of the

limitations of cryotransport, or its implications. This requires that we present the realities of our program quickly, yet comprehensively. Alcor must be operationally prepared to respond also.

In an urgent surcharge-related case, Alcor must prepare to carry out a last-minute, emergency cryotransport. Many individuals must be taken off other priorities. Major disruptions of our flow of activities occur. Alcor's ability to respond to emergencies affecting members with long-range, advance arrangements is reduced. Additional team members are placed on alert. Logistics priorities are reordered for maximum readiness.

Alcor incurs at least \$1000 in impact costs, in such cases. This must be covered by additional fees paid in advance, at the time initial applications are submitted, by the parties requesting such urgent preparations. Other standard charges and costs are associated with arranging for a cryotransport, outlined below in this section, so that those contemplating this option on an urgent basis can decide if they want to go further with investigating this as a possibility.

### FAX INTERCHANGE SYSTEM

In cases where Alcor is contacted by phone, from someone representing a last-minute prospective member, we have no idea of what we might be getting into from the standpoint of liability. Caution is absolutely necessary. All Alcor can do is to fax a twenty-page set of documents acquainting the caller with the urgent-case sign-up process (*on the web site, a link is provided here to the content of the fax*). The fax provides application forms and acknowledgment forms as well, pertaining to both of the types of cases that are frequently encountered (patient is conscious and mentally competent, or patient is comatose, or has already died). If you simply want to understand the essence of such a sign-up process, the above link will provide this. The actual application forms, conversely, would need to be faxed to you, if you were actually contemplating such a course of action.

Taking the above link, you'll see the care we take to make sure that there are no improper expectations on the caller's part. Before we start speaking with a stranger, or usually even one of Alcor's own members, about possible last-minute arrangements, we take precautions to make sure that Alcor, its signed-up members, and especially its patients already in a state of cryostasis, are as safe as possible!

### VISUALIZE YOURSELF IN A "LAST-MINUTE" SITUATION

If you called Alcor on an urgent basis, we may have suggested that you read the below material. It is an urgent inquiry, e-mailed from a link on the Alcor web site. It states that an inquiry had been made before, but no action had been taken. Now, death was impending.

The inquiry is paraphrased to avoid revealing the identity or the personal situation of the person(s) who inquired, but otherwise you are seeing an actual inquiry and our reply:

### (INQUIRY RECEIVED FROM ALCOR WEB SITE)

(Contact information omitted)

>MESSAGE:

>For Linda Chamberlain...

>I have received your materials in the past and spoken  
>to some of your people. A relative of mine (name omitted),  
>is now ready to join. He is a (illness omitted) patient and  
>has a fairly negative prognosis. It could be weeks or months.  
>I have downloaded your membership form and am having  
>my (three relatives) in (home State) fill them out with my  
>(key relative), sign them, pay the membership.

### (HERE IS ALCOR'S E-MAIL REPLY, EDITED FOR PUBLICATION; SEE CONTINUATION OF THE IN- QUIRY AS INDICATED BY ">" MARKS, FURTHER DOWN, AND MORE OF THE REPLY.)

Alcor is a membership organization designed to allow members to make arrangements well in advance of need. Cryotransport is not something that can easily be decided upon or arranged for at the last minute. A great deal of planning is required. This takes time and can be costly. It is not something to wait to organize until you have only a few weeks of life remaining.

On September 12, 1999, the Alcor Life Extension Foundation Board of Directors passed the following resolution:

*"Resolved: Under no circumstances will Alcor initiate cryotransport services to any person who does not have (1) complete legal paperwork, (2) complete funding, and (3) a waiting period of seven (7) days following completion of (1) and (2), without approval of the Board of Directors. Under circumstances where either (1) or (2) are lacking, a \$25,000 surcharge will be applied."*

Understanding that Alcor does not encourage last-minute cryotransport operations, it is important to make arrangements well in advance of need.

1. Time is of the essence. The sign-up process takes most people a month or more to complete. The four-page application is only the first step. We take the information on that application and use it to fill out legal documents that must be signed, witnessed, and in one case, notarized.

2. The next step is to pre-pay the funding. If your Membership Application Package is more than 6 months old, you have dated information and need a new package. Please give us a mailing address so this can be mailed to you. We have specific paperwork that needs to be signed for pre-payment.

3. Acceptance into a hospice organization generally takes several weeks after application has been made. Most hospice organizations will have a list of acceptance criteria that can be obtained in advance.

4. An Arizona physician must be attending the patient in advance of the patient's death in order for that physician to be able to sign the death certificate (a legal form that is required). Without this, an autopsy is almost certain to be required. This

is another important reason for persons in terminal conditions not to wait until the last moment to relocate to the Scottsdale area (if that is the plan).

5. Standby is an optional service that should be considered in order for Alcor to deliver the best possible care to the patient. Biological deterioration begins within seconds after a patient's heart stops. This then cascades into difficult-to-reverse damage that can result in the loss of memory and identity, even if the patient is resuscitated (as is often the case when heart attack victims are resuscitated in hospital).

Stabilization procedures are only protective against such biological damage if they can be started within a few minutes, and some within a few hours, of clinical death (and the sooner they are begun, the more protective they are). After a given period, they are of little help, and with extended time can actually do more harm than good. Time is often our greatest enemy. Standby arrangements allow Alcor to have a team at the patient's side when the heart stops (barring unforeseen circumstances) to begin stabilization and protective care as early as possible, minimizing the biological deterioration of the dying process.

As stated above, this is not something that can easily be arranged for at the last moment. Members and their families need to begin the process of making these arrangements as early as possible so that Alcor can contact the hospital or hospice organization and begin to develop a standby plan.

#### **(CONTINUATION OF THE INQUIRY)**

>In the meantime I have done some research on hospices  
>and hospitals in the Scottsdale area on behalf of my  
>(relative). What would be really helpful is a one-page  
>step-by-step on what we would do in the event he is  
>told he has two weeks to live.

#### **(CONTINUATION OF REPLY)**

As stated above, this is not something that can be done in the last two weeks. You need to begin the process of making these arrangements now (as you say you have, by having the application signed). Once the membership is in place, we can contact the hospice organization you choose and begin to develop a relationship and a standby plan.

This will also require that you have provided for a standby (as opposed to having Alcor called after the pronouncement of death). Below is appended information about standby. This is an optional service and is paid for separately. This must also be funded in advance of need.

#### **(CONTINUATION OF INQUIRY)**

>That is how the doctor described the likely course of  
>his particular type of (illness), which would give  
>(relative) time to come directly there. (The relative)  
>is prepared to pay all cash and has monies set aside  
>to do this. He would want (election of option as to  
>whole body or neuro). I have visited your site...and  
>could not find this process, i.e. exactly what to do  
>step-by-step.

>Thank you for any help you can provide via e-mail, fax  
>(number omitted), or phone (number omitted). We  
>are out of town right now...but will be back end of day  
>tomorrow. submit2  
>Submit Form

\* \* \*

(What follows is more material from the same  
Alcor web site page.)

#### **ALCOR CRYOTRANSPORT STANDBY SERVICES**

by Linda Chamberlain,

Alcor CryoTransport Manager

(This article was published some time ago, when Linda was  
CryoTransport Manager)

For years Alcor has made repeated attempts to inform members that Standby services and their costs cannot be included in CryoTransport (cryonic suspension) insurance funding. There are two primary reasons: (1) a Standby is an open-ended process that could go on for many days without any way to know the duration in advance; and (2) if the member survives a Standby (such as during surgery), the member's insurance will not cover it.

The purpose of this article is to discuss what a Standby is, why every member should consider having Standby services, what a typical Standby (if there is one) might cost, and how to provide Standby funding easily and conveniently without financial sacrifice.

#### **What Is Standby and Why Is It Advantageous?**

To understand the many phases and complications of a Standby, one must understand what a CryoTransport Team is trying to accomplish. CryoTransport describes the entire process of attempting to transport our members to a future time and place where medical science can heal and recover them, returning them to a state where they can continue with their lives. CryoTransport can be broken down into three major areas: (1) Standby and Remote Transport to Alcor, (2) Cryoprotective Perfusion, and (3) Cooldown and Long-Term Care.

Standby and Remote Transport, which include patient acquisition and stabilization, are time-critical. The greater the delay, the greater the physiological damage caused by diminished or halted blood flow to the tissues (ischemia). The eventual amount of freezing damage is also affected by the duration of ischemia. For example, if ischemic damage results in a leaky capillary bed, the perfusion of cryoprotective chemicals into the tissues will be compromised.

Every minute counts. As a result, if Alcor is not notified of a member's need for assistance until after the pronouncement of legal death, a devastating delay could result (especially if the member does not live in Arizona, which includes the majority of Alcor members). Even if the next available flight is not many hours away—as will often be the case when a member goes into cardio-pulmonary arrest in the wee hours of the morning—just calling to find out airline schedules takes time.

There are two major instances in which Alcor would provide a Standby. The first is when a member has scheduled

surgery or some other risky medical procedure. The other most likely scenario is when a member nears death as the consequence of a terminal illness. Since logistics and duration (and therefore, cost) of Standby are very clear-cut in the first instance, preparations for it are also much easier. However, while terminal illness may be more difficult in terms of planning, some form of Standby is vitally important in such situations.

### **The Logistics Trip and Advance Preparation**

The coordination of a Standby and Transport requires an intensive effort to anticipate potential problems and try to eliminate them. If at all possible, Alcor personnel (usually Alcor's CryoTransport Manager) should make a "logistics trip" to the Standby area to accomplish this goal and contact key people in advance. Preparation of these influential players greatly helps to lessen their possible distrust of the individuals and situations involved, as well as improving the likelihood that they will cooperate in a timely, well-coordinated manner.

In this article I am assuming that the member's family already supports his or her desire to be frozen. Without that cooperation, a Standby or transport may not even be attempted. Assuming cooperation with family members, the next three most important people (or organizations) that Alcor must coordinate with are (1) the coroner, (2) the patient's physician and hospital, and (3) the contract mortician. (See below for major contact points with each.)

Contact with the coroner must come first. If the coroner is hostile and will not cooperate, other plans must be made (for example, finding a way to move the member/patient to another county or state). If the coroner is cooperative, the next contact is the personal physician (who can bring hospital cooperation along with him). The third step is then to contact a local mortician for assistance with transfer paperwork, arrangement of transport from the hospital, and an appropriate facility for the surgery and wash-out procedures.

Whenever possible, Alcor's CryoTransport Manager or an on-site CryoTransport Technician should meet with these individuals in the presence of the member (or the member's family, if the member's health dictates) for whom the Standby is being arranged.

Experience has shown that the coroner, physician, and mortician are all usually at greater ease in these coordination meetings if they know that the member/patient and the family agree with the proposed plans. Such meetings can be handled by teleconference, but are usually more successful if done in person.

### **Information and Questions for Coroners**

1. Communication of our goal: we are attempting to minimize the biological deterioration associated with the dying process. This requires quick action because cellular damage begins at (or, in some cases, even before) cardiopulmonary arrest. To minimize biological deterioration we need to start our procedures with absolute minimum delay. This means that we need to have our patient pronounced and then released from the hospital as quickly as possible after cardiopulmonary

arrest.

2. Will she or he cooperate with that?

3. What circumstances would require autopsy? In those cases, can the autopsy be limited to the trunk (i.e., can the brain be spared)?

4. What does the coroner need to effect an immediate release of our patient from the hospital?

4-a. Does the coroner need a phone conference with the physician? If so, make sure that the physician and the coroner speak to each other in advance. Both of them should understand exactly what each other needs, and should know how to contact each other immediately (phone numbers, pagers, etc.). By arranging communication between the coroner and physician in advance, less confusion and fewer obstacles are likely to appear at the last moment.

4-b. Does the coroner need any paperwork completed? Can we get a blank form and fill it out in advance? How can we get this paperwork signed by the physician or hospital and delivered to the coroner in the most efficient way (fax, courier, etc.)?

### **Information and Questions for Physicians/Hospitals**

1. As with the coroner, does the physician understand our goals?

2. Will she or he cooperate with us and assist in gaining hospital cooperation?

3. Can the patient be pronounced promptly? What arrangements are necessary to make this happen?

4. Do the physician and hospital recognize Alcor's authority to accept the patient as an anatomical donation?

5. What is his/her fax number so we can fax the "General Information for Hospital Personnel"?

6. How far are the physician and hospital willing to go in cooperating with us? Non-interference only? Medications and IV line only? CPR?

7. Are large quantities of ice available at the hospital and mortuary?

8. Can Alcor personnel wait nearby (e.g., in the floor lounge)?

9. Can Alcor equipment be stored nearby (e.g., in an empty room)?

### **Information and Questions for Morticians**

1. Does the mortician understand Alcor's goals?

2. What is his or her response time in an emergency? To determine this, add the paging and response time to the round trip driving time. If this is greater than 10 minutes, is the mortician willing to stand by at the hospital? How much will that cost? Does the member/patient understand the importance of cutting this time? Does the member authorize the added expense?

3. Is the mortuary Transport vehicle a van or a station wagon? Will the portable ice bath and heart-lung resuscitation equipment fit into the mortician's pick-up vehicle? Is there room to perform cardiopulmonary support in it? If not, arrangements need to be made to rent or borrow a vehicle that will accommodate this need.

4. Will Alcor receive priority over the mortician's other

customers?

5. Will an embalmer assist with the surgery prior to a blood wash-out? Additional charges?

6. Can the equipment be set up in advance? Additional charges?

7. Can additional equipment be stored at the mortuary? Additional charges?

8. What does the mortician need to interface with the coroner and hospital?

9. How quickly can the death certificate, transfer permits, cremation authorization, etc. be obtained?

10. What else will be required for him or her to get our patient shipped promptly? How much can be done in advance?

### **Considerations Affecting Standby Costs**

Even if the logistics trip was successful and all apparent obstacles have been eliminated, unexpected problems lurk in the shadows of every Standby. For example, although Standbys necessitated by surgery have a fairly well-defined length and cost, medical complications could arise when least suspected. If the member does not recover well, the Standby could last significantly beyond original projections.

When Standby is performed for a terminal member, determining Standby length is even more difficult. The CryoTransport Manager and member must carefully balance expense versus need. If the CryoTransport Team enters the field too early, the costs of Standby may become unnecessarily high. If the Team is not deployed soon enough, the member could go into cardio-pulmonary arrest before the Team arrives.

Both financial and medical considerations need to be considered. Each case is different, and so expenses cannot be completely determined in advance. For this reason, the member for whom a Standby is being performed must place a deposit with Alcor ahead of time. After the Standby is performed, Alcor will provide an accounting, and refund unused funding per the member's wishes (cash refund, or, in the event the member is suspended, donation of excess funds for research, etc.).

Although setting a single, pre-arranged fee would be impractical, it is possible to give a typical Standby cost-range based on a breakdown of various elements.

### **Covering the Unexpected**

An unexpected need for Standby usually poses the greatest problems. What if you suddenly fall ill with appendicitis, are rushed to the emergency room, and have no way to make Standby pre-arrangements? Even though Alcor could not carry out a logistics trip in advance (possibly compromising any Standby), some members would still prefer to call us and ask for the deployment of a CryoTransport Team.

This last-minute scenario would require a slightly different type of accounting. Without the advance logistics portion, actual Standby would become far more difficult, forcing the CryoTransport Team to account for every possible complication.

Such a Standby would probably require the participation of more Alcor staff members, and possibly local assistants as well (if available). Every situational difference will change the

billing to one degree or another.

### **A Simple Way to Provide Standby Funding**

Some Alcor members have chosen a very simple and inexpensive way to provide funding for unexpected situations. A member need only provide a credit card that Alcor is authorized to draw against in such an emergency. Since you want to have your full credit limit available at all times, this credit card should have no other purpose but Standby funding.

As you can see, Standby provisions handled in this fashion do not need to represent a cost unless you actually use the service.

Further, because Alcor can confirm that sufficient funds are available on extremely short notice, the dedicated credit card account allows us to accommodate emergency requests for Standby services without being hampered by funding questions. And, unlike setting aside specific funds that you might prefer to invest elsewhere, you will not lose any interest or potential appreciation of assets.

### **Conclusion**

Arranging for your Standby is the single most important thing you can do to improve your chances of a good CryoTransport, but you must make these arrangements well in advance. Don't be caught by an unexpected emergency—provide for your Standby now, so that Alcor's CryoTransport Team can be there when you need us.

If you have any questions on this subject, please give me a call or email me at [linda@alcor.org](mailto:linda@alcor.org).

\* \* \*

### **SUMMARY**

Urgent Inquiries, or "Last-Minute Cases," bring the possible cryotransport patient (and/or the family of such a person) into a jungle of complexities, at a most inopportune time. To the stress of a terminal illness or critical care problem is added the dilemma of choosing (or not choosing) a radical approach to saving lives, which properly should receive long, deliberate consideration.

Notwithstanding the difficulties of such situations, Alcor cannot simply turn away from such calls for help. Instead, we must methodically insist that the persons concerned come face-to-face with the realities of what they are asking about, and make informed decisions, however difficult, in far less time than would be desirable.

If those who inquire, despite all the difficulties and uncertainties, choose to reach out for life, we are here to help. If the challenge is too great, or if the time is insufficient to make a commitment, we can only empathize and wish that circumstances permitted more time to deliberate the possibilities and to prepare. Above all, our goal is life, and we hope that yours will be boundless, although we recognize that such a goal may be too early for those who finally inquire only after a life is already endangered. 1

*(On the following pages are a sample Standby Contract and a schedule of fees)*

**STANDBY CONTRACT (Sample Only)**  
Alcor Life Extension Foundation, 7895 E. Acoma Dr., Suite 110, Scottsdale, AZ 85260

**ALCOR EMERGENCY STANDBY PROVISIONS  
ADDENDUM TO SUSPENSION AGREEMENT**

(Name) \_\_\_\_\_, Alcor Suspension Member No. A- \_\_\_\_\_, (hereinafter known as "Member"), requests that his/her Cryonic Suspension Agreement (CSA) with the Alcor Life Extension Foundation (a California corporation with address at 7895 E. Acoma Drive, Suite 110, Scottsdale, Arizona 85260, hereinafter referred to as "Alcor") be amended as follows, subject to the following understandings, terms and conditions:

Member recognizes that without specific provisions for Emergency Standby (readiness to carry out a CryoTransport, also known as cryonic suspension) as set forth in this document, Alcor has no authorization or basis for deploying personnel or equipment (performing a Standby) prior to pronouncement of Member's legal death.

I. Specific Understanding and Agreement: With his/her initials, \_\_\_\_\_, Member requests and Alcor agrees, subject to the availability of personnel, equipment, and the limitations described below, to perform a Standby for the Member, owing to circumstances named below: (may include such conditions as "terminal illness", "surgery where the possibility of loss of life exists", "imminent danger of loss of life", etc.)

1. Basis for Standby: \_\_\_\_\_

2. Location and Date/Time.

The location and date/time of the standby shall be as follows:

Location: \_\_\_\_\_

Date/Time: \_\_\_\_\_

II. General Understanding and Agreement: With his/her initials, \_\_\_\_\_, Member requests Emergency Standby services, and in Attachment I hereto provides funding for such Standby services, in all cases where Member might still be alive but likely to enter a state of clinical death and where Alcor determines such preparation would be appropriate.

Member understands that the final decision to begin or discontinue a Standby under such circumstances is to be made solely by Alcor, and that Alcor does not, by this document, contract to provide Standby of any specific level or in any specific circumstances. All understandings of limitations, uncertainties, and risks stated in the basic Cryonic Suspension Agreement, as well as those described below, shall apply to all parts of this addendum.

1. Physician and/or Hospital Cooperation. Any Standby may be critically limited, and any CryoTransport operation may be seriously compromised or even aborted, by lack of cooperation (or interference) on the part of medical care institutions, medical care personnel, or governmental authorities. The following are criteria that include, but do not limit, those elements of cooperation and/or non-interference necessary for Alcor to carry out an effective standby. The situational aspects of these criteria are oriented to a hospital, but can apply to any other situation, such as nursing home, private residence, or medical care field location:

a. The Alcor Team can do its best job only if it is given the urgency and cooperation as would be expected with a team of professionals harvesting an organ for transplantation where anything in excess of four minutes ischemia jeopardizes the quality of the organ. This is an extremely demanding criterion, inasmuch as most all organs for transplantation are not "bonecase bound" (swelling of the organ after cardiac arrest induces damage). The brain, with its sensitive biochemistry and confinement within the cranial cavity, is the organ of greatest risk for our procedure, added to which it is the primary organ for which our procedure is designed.

b. Prior to pronouncement of death, the Alcor Standby team (6 persons maximum) needs access on a 24 hour basis to waiting rooms or other comparable accommodations no more than 100 feet from the patient's location (operating room, ICU, or hospital bedroom in which the patient will be treated and/or cared for.)

c. Alcor's equipment (including but not limited to: mobile rescue cart, cooling chests, portable oxygen bottles, surgical kits, medications and apparatus, and data acquisition systems) needs ready access location within 100 feet of the patient's location as described in "a" above.

d. Alcor's rescue vehicle needs parking on a 24 hour basis within 100 yards of entry to standby equipment location.

e. Alcor's CryoTransport Team Leader (and/or responsible Shift Representative) needs to be extended "next of kin" status; this person needs to be permitted to use cellular telephone(s) or other similar modalities of communication, 24 hour visitor rights, and access to all charted medical data as well as other diagnostic results as they become available within the hospital's data system.

f. The Alcor Team needs to be permitted to proceed with biostabilization procedures (including but not limited to IV administration of medications, respiratory fluid infusions through endotracheal tube, external cooling by means of circulating cold water immersion, and cardio-pulmonary mechanical support) immediately upon prompt legal pronouncement of clinical death.

g. To minimize ischemic damage resulting from time delays before the Alcor Team begin its biostabilization protocol, the health care providers must leave all intravenous lines, endotracheal tubes, etc. in place.

h. Conditional waiver of autopsy by Coroners and/or Medical Examiners by prior coordination is vital, to the same extent and in the same way as such cooperation is enabled with donors of organs for transplantation in the event of cardiac arrest.

2. Equipment and Personnel Assigned. The equipment made available and personnel assigned (as may concern the number, training and experience of such personnel) shall be exclusively at Alcor's discretion, recognizing that Alcor shall have sole responsibility for determining what other risks to life among Alcor Members might exist, and what priorities of assignment and equipment deployment might be most reasonable.

3. Liability. Member holds Alcor completely harmless and without any liability whatever for failure to anticipate changes of Member's condition or seriousness of risk, for interference or lack of cooperation on the part of any government personnel, medical authorities, family members, friends or associates of Member, or for any failures of equipment, lacks of supplies, or any other cause except as may be the consequence of gross negligence or willful misconduct.

4. Dispute Resolution. Any controversy or claim arising out of or relating to this Agreement or the breach thereof, or to Attachment I relating to the costs of these services, shall be settled by binding arbitration in accordance with the Commercial Arbitration Rules of the American Arbitration Association, and judgment upon the award entered by the arbitrator(s) may be entered and enforced by any court having jurisdiction thereof. Additionally, the parties intend that the arbitrators have the power to issue any provisional relief appropriate to the circumstances, including but not limited to: temporary restraining orders, injunctions and attachments. The parties intend that this agreement to arbitrate be irrevocable, and agree that either party is entitled to injunctive relief to quash litigation by the other party which breaches this agreement.

4. Applicability of Dispute Resolution. The above provisions concerning dispute resolution shall apply to any and all other contractual provisions between Alcor and the Member, including but not limited to the Member's basic agreement(s) with Alcor for cryonic suspension, notwithstanding any other provisions which these documents might have contained. In this sense, execution of this

Agreement may act to modify or amend other documents, and such modification(s) and/or amendment(s) are herewith agreed to.

5. Authority to Approve or Amend. Member recognizes that only the Alcor Board of Directors has the authority to approve or amend a Cryonic Suspension Agreement; and only the Board of Directors may approve specific individual arrangements. None of these acts may be performed by any individual agent or officer of Alcor. This Emergency Standby Agreement Addendum to Member's basic Cryonic Suspension Agreement is not effective until signed by the Member in the presence of witnesses and approved by the Board of Directors of Alcor.

IN WITNESS WHEREOF, this Agreement has been executed by the parties on the date and year set forth above.

(Signature Block - Standby Agreement)

Attachment I - Fees and Methods of Payment (Standby)

As provided in the basic agreement, Member agrees to pay for services rendered according to the below schedule, plus actual expenses of travel, meals and lodging, advancing funds in blocks of \$5,000 to Alcor by authorization to charge to credit lines as follows (accounts and account numbers as shown below). It is understood that any advances not expended will be refunded with a detailed accounting of actual charges, within 30 days following standby:

Credit Source (circle) M/C VISA AMEX Account No: \_\_\_\_\_

Exact Name on Card \_\_\_\_\_ Exp. Date \_\_\_\_\_

Limitation (if any) to total standby expense: \$ \_\_\_\_\_

## Schedule A - Required Costs and Suspension Funding Minimums

*(This document reflects Alcor's fees, taking into account last-minute arrangements, updated as of 4/19/2000. Changes may have occurred since that date. Call Alcor to check, at 480-9045-1906.)*

This Schedule lists the various fees and minimum funding which the Alcor Life Extension Foundation (Alcor) requires from Suspension Members in connection with their cryonic suspension arrangements. Except where noted otherwise, any of these fees may be changed by Alcor with ninety (90) days written notice to the Suspension Members. Fees for "non-member" suspensions are also specified below, recognizing that most of the other fees paid by Members will not apply (no dues are paid, rather, there is a surcharge that compensates for this and recognizes the potential for legal difficulties owing to difficulties of obtaining informed consent and possible family opposition.)

I. Cryonic Suspension Application Fee. An administrative charge, payable in advance, for legal paperwork, handling, and other Alcor expenses associated with Suspension Member sign-ups. Additional billing for lengthy application periods begins after six months, except where special arrangements exist.

Application Fees:

\$150.00 (insurance funding)

\$500.00 (plus attorneys fees for trusts and complicated funding)

\$1000.00 Additional impact fee in surcharge-related cases.

\*After Six Months: \$ 25.00/month payable to Alcor if arrangements have not been completed, to extend signup period and avoid payment of new application fee with resubmission of application.

II. Required Suspension Fund Minimums. Before approval of a Cryonic Suspension Agreement, Alcor requires the Member to guarantee a certain level of funding which will be paid to Alcor upon the legal death of the Member, to support the cryonic suspension, maintenance, and, if it becomes possible, the revival of the Member. (See Cryonic Suspension Agreement, Section I, DUTIES OF THE PATIENT, Article 4.) Current minimum funding levels are:

1. Whole Body Suspension: \$120,000.00 (\$70,000 goes to the Patient Care Trust.)

2. Neurosuspension: \$ 50,000.00 (\$17,000 goes to the Patient Care Trust.)

3. Additional Fee for Suspension Members residing outside of the United States: \$ 10,000.00

### METHODS OF SUSPENSION FUNDING

1. Insurance policy: The Member shall a) transfers ownership of the policy to Alcor (Alcor provides a guaranteed "buy-back" agreement to Member), and b) name Alcor as the beneficiary of the policy.

2. Trust: The Member's trust shall conform to the provisions of Alcor's Trust Policy, which require that Alcor serve as Sole Trustee of the Trust, and that the Trust have no purpose or responsibility other than the funding of Member's cryotransport (suspension). See the Alcor Trust Policy for further details on making use of this approach.

3. Prepayment in full. An agreement for this option can be obtained from Alcor.

These are the only three funding mechanisms that provide both Alcor and the Member with the necessary protection. This is important to Members who want assurance that Alcor will remain financially strong and capable of providing sound protection for patients in cryostasis as well as being capable of offering cryostasis services in the future. Irrevocable beneficiaries and collateral assignments can be problematic, do not offer sufficient protection, and cannot be used to fund cryostasis (cryonic suspension).

### SURCHARGE RELATED CASES

4. A Surcharge is required for non-member suspensions. (In a "non-member suspension", the suspension arrangements are not completed until after legal death of the person to be suspended, or, are made by a "third party" on behalf of one who is not mentally and emotionally competent to make a reasoned decision on the basis of appropriate informed consent, or are required to be consummated in a such a state of urgency such that videotaped signup is needed to confirm mental acuity, or in cases where rescue team activities are required within one week of completing the documentation and funding arrangements). Amount of Surcharge: \$ 25,000.00

IV. Dues. Alcor charges Dues to all living Suspension Members, which support its programs and are tax exempt to the extent of 90 percent of what is paid. This fee may be paid annually, semi-annually, quarterly, or monthly. Alcor may increase the standard rate of Dues with thirty (30) days written notice to the Member, although Life Member Dues are fixed. (See Cryonic Suspension Agreement, Section I, DUTIES OF THE PATIENT, Article 3.)

The current Dues are:

1. First Member in family: \$360.00 annually (\$90.00 quarterly)

2. Each additional family member: \$180.00 annually (\$45.00 quarterly)

3. Minor (less the 18 yrs.) family members: \$90.00 annually (\$22.50 quarterly)

4. Full-time student: \$180.00 annually (\$45.00 quarterly)

Life Member Dues. The base dues for new Life Members tend to increase with time. At this time, Life Memberships may be obtained for \$20,000.00, or on an installment plan of \$100/month for twenty years. Dues may also be paid in installments or a number of other (quarterly / annual) plans. Discounts for additional family members and minors follow the above pattern.

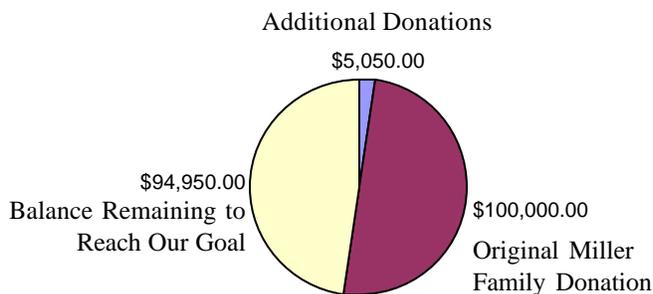
# Our Thanks!

To:

**Robert Appa  
Richard Gillman  
Michael Grodzicki  
Ravin Jain, MD  
Irene Olberz  
David Shipman, ACT-B  
David Ward**

**For additional donations to the Marketing Project**

**Goal: \$200,000 Marketing Project**



*Please join them and help us reach our goal. Non-profit organizations cannot receive a large percentage of their income from just a few donors. The law prescribes a minimum number. We need your donations in order to be able to continue to accept the annual donation pledged by the Miller Family!*

**Send your donations to Alcor, in care of:  
Linda Chamberlain  
7895 E. Acoma Drive, Suite 110  
Scottsdale, AZ 85260**

(Global Membership; *continued from page 20*)

Alcor would not be acting responsibly if it took time and other resources away from its own members in order to help build other organizations. Therefore, Alcor would have to ask substantial consulting fees to justify involvement (fees that could then support Alcor's other members and obligations). A substantial amount of money (in the order of \$500,000 US, as a minimum), for equipment, training, medical personnel, and consulting fees will be needed to finance the start-up of a capability equal to that offered by Alcor.

### Are there other sources of information about foreign life extension groups?

See the following web sites:

<http://www.onelist.com/community/cryonics-euro>

<http://members.wbs.net/homepages/c/r/y/cryonic4life/europe.html>

## Alcor Membership Status

Alcor has 518 Suspension Members (including 110 Life Members), and 43 patients in suspension. These numbers are broken down by country below.

Country	Members	Applicants	Subscribers	Country	Members	Applicants	Subscribers
Argentina	0	0	1	Netherlands	2	3	1
Australia	12	2	2	Russia	0	0	3
Austria	1	0	1	South Africa	0	0	1
Brazil	1	0	0	Sri Lanka	0	0	1
Canada	14	0	13	Switzerland	0	0	1
France	0	0	1	Taiwan	0	0	1
Germany	3	1	3	Turkey	0	0	1
Ireland	0	0	1	U.K.	25	7	7
Italy	0	2	3	U.S.A.	458	84	250
Japan	2	0	3				
Lebanon	0	0	1	<b>TOTALS</b>	<b>518</b>	<b>99</b>	<b>296</b>
Mexico	0	0	1				

No. of Countries: 21



# the ALCOR adventure

A Button Production  
By Billy H. Seidel

When I was a high school student in Seattle, Washington, I was privileged to view a black-and-white documentary film. This film was made by a man alone in the wilderness. He had an accident while chopping wood and disabled one leg. He limped out of the wilderness for almost five days. The amazing part is, he had the presence of mind to capture his adventure on film. Later, when asked what he was thinking about in order to get out, he said, "Well I just kept putting one foot in front of the other. I knew if I could do this enough times I would eventually get out." His film made a very lasting impression on me. I thought, if I could make a film like that and have that kind of impact on someone, I would have done something really important with my life. Now this really sounds corny. I can't help that, but it was with these thoughts that I approached "the ALCOR adventure."

The Asilomar conference had just occurred and videotapes were made of the various speakers. Fred Chamberlain asked me to edit them down to 60 minutes and get rid of all the glitches. I thought this would be a good place to put in a little promo for Alcor.

Watching a brainless television show, my mind wandered to a drafting board and an overhead view of graphs being drawn out to show life expectancies. Hey, this is something I could do for almost no cost, and I could do it in my office. The more I thought about this approach the more appealing it became. A couple of graphs, a little voice-over, music, some sound effects, and the next thing I knew, I had a 60-second spot. I put this together and sent it to Fred and Linda Chamberlain at Alcor. They are always so complimentary. I think they may have sandbagged me. Because, now they wanted me to do a video, much like the one I had done thirteen years ago, and I couldn't refuse such glowing compliments. Besides that, Alcor needed a video tool to reach potential clients, and this could help to do just that.

Here's the deal: No big budget. No big names for on-screen talent. No big production crews. No screenwriters. Cover a subject that is extremely convoluted. Everyone has a different opinion. Every facet of our lives is involved, like politics, religion, and immortality. All of the above has to be covered in 30 minutes. Well it can't be done! But let's see what happens if we keep putting one foot in front of the other foot for as long as it takes. Just like my high school hero did.

I used to play tennis with a movie producer in Los Angeles. He told me that a movie has three parts to it: (1) The

idea; (2) Shooting the idea; and (3) Editing. Almost all of the time, these three elements are a different story. Over the years I have made more than fifty videos. While they have been mini-documentaries, they all hold this same pattern. I only mention this in passing and say that "the ALCOR adventure" is no different. So I won't be disappointed if I seem to lose control along the way.

Anyway, I was thinking, let's use the 60-second spot. It briefly presented some ideas. Let's expand on these ideas in greater detail. Using the overhead shot technique as a transition, we can travel from one idea to another, as the story progresses. My first thought was to have a person (turned out to be me), unidentified, but representative of the viewer. I wanted that person to be asking the same questions that a new person to cryonics and Alcor might ask. That person would have to have some idea about the subject or they couldn't have asked the question in the first place. So my voice-over person needed to be as universal as possible. This was the idea, but in the end, I could not keep my personality out of it.

So the voice-over person posed a question. I wanted to have real people, people like me answer the questions with their own answers in their own way. I did not want actors or rehearsed speeches. I wanted realistic stuff, stuff that could be believed. These answers would be important to the viewers, if they were going to get a better understanding of cryonics and Alcor.

Whenever a project like this gets started there is a tendency for required elements to just kind of fall into place. At least this has been the way for me. The Asilomar conference was just completed, and Fred said I could use some of that video, and guess what? Another videographer had taken a camera with him to the conference and interviewed twenty-four people, about two-and-a-half hours of video. His name is Gregory T. Prentiss Jr., and boy, did he do a fine job. He allowed me to use his video for "the ALCOR adventure." This was not part of my original idea, but it was a part of the shooting and editing. Another element falls into place.

I had to acquire an individual release agreement from each person interviewed. This took a lot of e-mail and letter writing. Most agreed but some did not, or could not, at this time. Look for future videos on these folks. It was also necessary to acquire a copyright release for the background music. This, again, took a lot of e-mail and other requirements from Indigenous Australia, the music production company. The background

chimes are from my deck, on a breezy day, and the ticking is my office clock. I needed more interviews. And guess what? Alcor was having a training seminar. This would bring several doctors to one location, and I could get my needed interviews at that time. More elements fall into place.

My voice-over personality could not ask very technical questions because most of the audience might get lost. Besides, this is not a technical information tape. That will come later. So I needed to keep this on a more understandable level. Some of the subjects, such as patient care trust funds, religion, nano-technology, and stem cell research, just could not be dealt with in any more detail. There was just not enough time. These subjects were in the original idea and are covered briefly in the final version. So I tried to focus on vitrification and the fact that Alcor is using this procedure now. The subject of vitrification was not in the original idea but developed as shooting and editing progressed for “the ALCOR adventure.” The first draft included some “TimeShip” footage. I wish I could have used that. You would have been so impressed you would have had to stand in line to sign up with Alcor. Linda Chamberlain, Mathew Sullivan, and Jennifer Chapman saw the first working copy of “the ALCOR adventure.” Their inputs were greatly appreciated and edited into the final version. So, more elements just kind of fall into place, and I keep putting one foot in front of the other.

You know, the most important element in this video is the people I interviewed. They were all very patient and cooperative and offered some helpful suggestions of their own. What you see in the video are answers to one or two questions. I actually asked five questions, and in some cases, they had to repeat their answers several times. These folks did very well and never complained. Fred and Linda were great with the interviews. I wanted to capture the essence and the humor of each person. I tried to keep this video as close to a documentary as I could, as close to “it is what it is” thinking. (My quote.)

Now, I have all of the elements that I require and here I sit at my computer with a blank screen and a lot of ideas. All that remains is to select the best of the various clips and put them in the proper order. I have to identify each of the people and see that they receive the appropriate credits. Titles and name spelling are extremely important. There has to be an opening grabber. I look for dissolves, fades, keys, and special effects. What can I do about lighting and sound? Most of this I can't change, but what can I do to make it better? After all, it is what it is. How do I keep talking heads from not looking like talking heads? Well, it goes on and on. I take a step, and another, and another, and 200 hours later I am there. Knowing when to quit is another very important part of any production. I know I probably left out some important stuff, and I can't please everyone. Soooo, I quit.

Overall the above sounds like another sales pitch for Alcor. I am sorry about that. By now you must realize that I have the greatest respect and admiration for all of the people involved in this project. I thank them for their help and ideas.

Oh yes, I should tell you. There are two fictions in “the ALCOR adventure.” I'll leave it up to you to find them.

I look at it this way. If we can keep putting one foot in front of the other enough times, these efforts might just save my life and yours.

Here are a few facts about the video:

- 35 people directly involved one way or another.
- 55 e-mails.
- 25 pages of scripts and rewrites.
- 5 hours for Gregory Prentiss.
- 200 hours for Billy H. Seidel.
- 22 hours of video to sift through.
- 3 sound effects.
- 10 shooting locations.
- 1 edited music selection.
- More than 350,000 computer keystrokes.
- \$24,000=cost of equipment used.

1

Bill Seidel's “Alcor Adventure” integrates comments from key people standing outside under the pines at Alcor's Asilomar conference (as videotaped by Greg Prentiss), clips from actual presentations and panel discussions at the conference, comments from physicians at a training seminar at Alcor, and other materials that give the viewer a great introductory feeling for the Alcor program. More to the point, he methodically takes you through the mental process most people would encounter in trying to make sense of the idea, from initial curiosity to the point of making a decision.

Other videos of presentations from Asilomar are also Bill's work, definitive editing of the best of the conference in specific areas. There are a few more videos to be released and edited, but you get the core of what relates to Alcor's programs, all now available on high-quality VHS format. More information on how to obtain these will be published in the next issue of *Cryonics*. You've heard the term “all digital production” used in many contexts, but that's really true of these videos. They were shot in mini-DV, copied and clipped and backed up in mini-DV, and the only time they were “out of the cameras” were when they were in Bill's computer. The final production runs onto VHS tape were made straight out of one of BioTransport's mini-DV's into the tape duplicator contactor's amplifiers. I think you'll like the quality.

Most important, on all of these productions by Bill Seidel, the first 60 seconds of the tape contains a very compact, capsule-concept introduction to the whole concept of life extension and cryonics. Judge for yourself, but I think this is the kind of treatment that could run on TV and produce a lot of inquiries from intelligent, thoughtful people who don't want to miss out on seeing what the future holds. If you're showing these videos to family or friends, this is the most powerful “leader” you could ask for. I'll be interested in hearing what you have to say about that, when you have an opportunity to try it.

—Fred Chamberlain

# Affective Computing

By Rosalind Picard

MIT Press, 1997

Book Review by Mike Perry



Can a computer have emotions? Should it? These questions are addressed by Ms. Picard in her book, with qualified, affirmative answers. What should it mean for a machine to “have” emotions anyway? This begs the question of what is an emotion in the first place, a controversial enough topic in its own right. The author does not duck these difficult

issues but confronts them head-on, though the reader must be patient. This is not a good place to search for quick or easy answers, but a careful perusal will yield an abundance of insight.

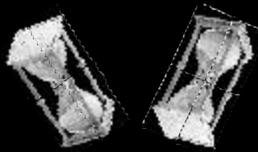
Basically, when it comes to the machine’s having emotions, the position is that “if it looks, walks and quacks like a duck, assume it’s a duck.” If the machine, suitably programmed, passes enough behavioral tests and has a reasonable internal modeling of emotions, it qualifies. Even then, though, it is not necessarily conscious. “Having” emotions could still be a kind of surface effect, not the real thing after all, though still useful for our purposes. In any case, we would deal with our machines *as if* they had real emotions, though how far that should go (in the area of civil rights, for instance, if a machine should demand such things) is an unresolved question. But why go to all the fuss? “I have come to the conclusion,” says the author, “that if we want computers to be genuinely intelligent, to adapt to us, and to interact naturally with us, then they will need the ability to recognize and express emotions, to have emotions, and to have what has come to be called ‘emotional intelligence.’”

Certainly there are times when we want these things. We want machines we can converse with and not merely program, and which (who) will understand what we want and make reasonable and competent efforts, like willing and expert human helpers, to bring it about. Indeed, the more you think about it, the more ways you can see that this would be useful—

and we haven’t gotten started yet. Some useful and near-term applications the author foresees involve close person-machine interactions, in which our own feelings are recognized and responded to. One example is the “affective mirror,” which would allow practice job interviews. A simulacrum of the CEO you’ll be facing (or someone like him) is displayed on your monitor screen, and you have your interview. Your speech, mannerisms, and gestures are tracked through a video system that interfaces with a real-time analyzer, so that the image on the screen is able to respond in turn. Finally, it’s time to assess your performance. Were you too nervous, did you have proper eye contact, were you well-informed, and so on? The machine tells you, helps you improve your skills, and diminishes your anxiety level. At present this sort of thing has not been seriously implemented, though some approximation is probably feasible. It would not be competitive with a live human but would far outclass the traditional mirror. Once we got our foot in the door, improvements could be rapid, especially in view of overall trends in the computer industry.

A good affective mirror, in addition to recognizing the emotions of the user, would need to be good at expressing emotions through the simulacrum. Arguably this would involve “having” emotions in the author’s sense, for which the requirements involve both behaving *as if* emotions were present, and certain internal features such as interactions of emotive elements with memory, perception, decision making, reasoning, learning, and so forth. Recognizing, expressing, and having emotions in sophisticated and useful ways leads to “emotional intelligence,” which our system would possess in some degree, and this trait could be enhanced to further improve the system. Besides the affective mirror, other possible applications of affective systems would be natural speech synthesis, assisting autistic people to recognize emotional cues, facilitating computer-assisted learning, software that corrects its own bugs based on perceived user frustration, software that selects music to match or enhance one’s mood, and so on. Wearable computers with affective programming would open many doors in their own right, some of the simpler being to augment perception, memory, and mood with interactive video images or sound, based on perceived needs or wishes.

(continued on page 50)



# You Only Go Around Twice

by Jerry B. Lemler, M.D.



## One, three, two?

No, it's not a misprint. In our last issue (4th Quarter, 2000), I submitted Chapter One of the CRFT rewrite project for your perusal and comments. Below, I skip to Chapter Three. "So, what happened to Chapter Two?" you might wonder. Well, fortuitously, there is a logical explanation for this apparently unwarranted juxtaposition. Chapter Two (along with several other chapters), was written in the late summer of last year, and at that time, it represented a state-of-the-moment recitation of Alcor's cryopreservation procedures. But, as we know from our studies of physics, moments are often fragile in time, as was the "moment" presented in Chapter Two. Enter "vitrification," and those rewritten chapters that included pertinent information on operations and protocols need (happily) to be revised yet again. Chapter Three, however, traces some provocative historical underpinnings of the philosophical justification for the ritualistic acceptance of death. It's a timeless offering about a time-limited subject, which will only require revision upon the success of cryotransport or the reversal of the aging process. May we all live long enough (by whatever means) to see it happen.

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### CHAPTER THREE "Time and Time Again"

"Death is caused by swallowing small amounts of saliva over a long period of time" – Rush Limbaugh.

"Dying is a very dull, dreary affair. And, my advice to you is to have nothing whatever to do with it"—W. Somerset Maugham.

\* \* \* \* \*

#### The Right Stuff?

A short time ago *Stuff for Men* magazine published an article entitled "The End Zone" in which the writer, one Fiona Jerome, detailed (with accompanying graphic illustrations and photos) her choices of the fifty worst ways to die.<sup>1</sup> Ms. Jerome's "top 50 hits" methodically included some of the obvious: burned at the stake, hung on a cross, contracting Bubonic Plague, boiled alive, and a few not so common: sawed in half, skewered in the Iron Maiden, chomped by maggots, and pulled apart by horses.

No matter the manner in which it occurs, our disdain for an appointment with the Grim Reaper is nearly a human universal. True enough, we may well posit in our younger years how we wouldn't wish to decay into wrinkled antiquity, cowering as we envision the inward condition and outward appearance of a certified centurian.

Along with advancing age, however, (at least most of the time), we accumulate increasing doses of the cherished

commodity of wisdom. And, with these additional morsels of wisdom, we're positioned to render more exact and beneficial judgments, to the point where it's actually quite easy to find someone who'd dearly love to blow out a hundred candles with however many breaths it should take. Just ask anyone who's 99!

This point was poignantly driven home back in 1903 by Professor Elie Metchnikoff. "The fact is that only one man in a million at present dies a natural death. We should live till one hundred and forty years of age. A man who expires at seventy or eighty is the victim of accident, cut off in the flower of his days, and he unconsciously resents being deprived of the fifty years or so which nature owes him. Leave him a little longer and in due time he will desire to die, as a child at dusk desires to sleep. The sandman will pass! All our instincts drop from us one by one. The child cries for mother's milk; the idea of such an ailment is repugnant to the adult. The desire for sweets, for play, for love and lovemaking, for long walks and adventures are all impulses that have their day and pass. And the wish to live is an instinct which fails also with satiety. Only at present none of us live long enough to be satiate with days."<sup>2</sup>

#### Be Not Proud

The termination of our earthly existence has likewise been the subject of countless human explorations and endeavors. From canvases to statues, from manuscripts to bumper stickers, from operettas to T-shirts, the presumed consequences and intrinsic meaning of death have been the recipients of a veritable cornucopia of our expressions—running the portrayal

gamut from supplicating reverence to bellicose derision.

Arguably, the most vivid representation of the former position was bequeathed to us by 19<sup>th</sup>-century poet Emily Dickinson in writing "I Heard a Fly Buzz When I Died":

I heard a fly buzz when I died  
The stillness in the room  
Was like the stillness in the air  
Between the heavens of storm  
The eyes around had wrung them dry  
And breaths were gathering firm  
For that last onset when the king  
Be witnessed in the room.  
I willed my keepsakes, signed away  
What portion of me be  
Assignable—and then it was  
There interposed a fly,  
With blue, uncertain, stumbling, buzz,  
Between the light and me.  
And then the windows failed, and then  
I could not see to see.<sup>3</sup>

By any quantifiable measurement of romanticism, Dickinson's mid 20<sup>th</sup>-century counterpart, Dylan Thomas, offered perhaps the ultimate example of riveting defiance by penning "Do Not Go Gentle into That Good Night":

Do not go gentle into that good night,  
Old age should burn and rave at close of day;  
Rage, rage against the dying of the light.

Though wise men at their end know dark is right,  
Because their words had forked no lightning they  
Do not go gentle into that good night.

Good men, the last wave by, crying how bright  
Their frail deeds might have danced in a green bay,  
Rage, rage against the dying of the light.

Wild men who caught and sang the sun in flight,  
And learn, too late, they grieved it on its way,  
Do not go gentle into that good night.

Grave men, near death, who see with blinding sight  
Blind eyes could blaze like meteors and be gay,  
Rage, rage against the dying of the light.

And you, my father, there on the sad height,  
Curse, bless, me now with your fierce tears, I pray.  
Do not go gentle into that good night.  
Rage, rage against the dying of the light.<sup>4</sup>

### Tolling Bell Thoughts

After presenting a doctoral dissertation on the anatomy of the flatworm, codifying the topographic and structural models of the unconscious mind, detailing the theory of infantile sexuality, and laying the foundation for the rational interpreta-

tion of dreams, Sigmund Freud, the so-called "Father of Psychoanalysis," had surprisingly little to say on the subject of death. While he did conceive a dualistic instinctual drive system (Eros= life; Thanatos= death), throughout his lengthy and voluminous career he never remained fully committed to these adversarial theoretical constructs, and he rarely expounded on the topic.<sup>5</sup>

Other individuals of prominence were not unexpectedly quite as silent. Thanatologist Dr. Elisabeth Kubler-Ross built a stellar career in categorizing our confrontations with oblivion, while muckraking journalist Jessica Mitford prospered greatly at death's expense.

To this day, *On Death and Dying*, the 1969 Kubler-Ross classic treatise on the emotional underpinnings of the terminally ill and their families, remains the gold standard text of medical training programs throughout the world on its subject. Dr. Kubler-Ross is credited with introducing a mechanized progression of stages through which the terminal patient traverses along the "bell lap." Denial and Isolation gives way to Anger, which in turn yields to Bargaining. Then, Depression rears its ugly head before the final stage of Acceptance can emerge.<sup>6</sup>

Regrettably, Dr. Kubler-Ross obstinately clung to her constructs as pure gospel, obscuring her ability to assimilate alternative potentials offered by advancing medical science and technology. These exciting possibilities, headed (as you may have already guessed) by biostasis, didn't neatly fit in with Kubler-Ross's rigid, methodical stage-oriented premise, so she rejected them *carte blanche* not only for herself, but in her condescendingly tunnel-vision manner, for the rest of us as well.

After delivering one of her volatile orations as the featured speaker at the Funeral Service Seminar in October 1995, in Tiburon, California (an engagement she relished by saying, "That's like Ralph Nader being invited to address General Motors!"), Jessica "Decca" Mitford fielded a question from the audience.

"How much money did you make from *The American Way of Death*?" queried the participant.

To what she described as audible groans, the oft-labeled "Queen of the Muckrakers" replied, "Absolute tons. So much I can't even count it. It made my fortune."

Modesty and Mitford rarely co-existed throughout the caustic journalist's lifetime. Born in 1917, one of six sisters, Jessica Mitford of Gloucester, England, was the likely source of more critical comments about death and its accoutrements than anyone in history. She was educated at home but shocked her family at the tender age of 20 by running away to the ongoing Spanish Civil War, marrying Communist Esmond Romilly (Winston Churchill's nephew), in the process. Romilly was killed in action, and two years later Ms. Mitford married labor lawyer Robert Treuhaft, immigrating to the United States in 1939.

Mitford and her husband settled in California, where they became active in the Communist Party. In the 1950s the distaff agitator rose to sufficient prominence to end up on the U.S. Attorney General's list of subversive citizens, and she was subpoenaed by Joseph McCarthy's infamous Committee on

Un-American Activities. Mitford became disillusioned with the Communist Party, forsaking membership in 1958. Her declining role in political reform activism spearheaded a logical transformation of her efforts into the profession in which she would leave an indelible imprint—muckraking journalism.

Mitford was a polished and insightful writer, meticulously pursuing her subjects without quarter or mercy. Her life's passion was the American funeral industry, and its owners and directors became her targets. With the publication and rousing success of *The American Way of Death* in 1963, Mitford repeatedly pummeled ink-stained bull's-eyes, prompting many a death-rattling counterattack. One notable reader, who sadly had imminent need of the book's contents was then-U.S. Attorney General Robert Kennedy, whose grave responsibility was in arranging his brother's funeral.

No component of the death business was immune from the "Muckraking Queen's" assaults. She exposed the common practice of embalming (ostensibly performed only in North America for disinfectant purposes), as superfluous, and she derided the industry's practitioners over what she calculated to be their vastly hyperinflated funerary prices.

At the time of her own death in 1996, Mitford was near completion of an updated sequel to her original work. She had titled it *The American Way of Death—Revisited*. Research assistants completed the new edition, and it was published posthumously in 1998.

Mitford's impact on American funeral practices was nothing short of jarring back in the '60s, but she wasn't one to underestimate her opponents' cleverness and adaptability. Over the decades since *The American Way of Death* forced itself onto best-seller lists, funeral magnates varied and expanded their menu of services, while forming monolithic cooperatives to ensure greater and more efficient capturing of the marketplace. U.S. Department of Commerce statistics reveal the none-too-surprising fact that mortuaries have the lowest bankruptcy rate of any business in the country.

"Mitford's exposé made her such a target of the 'death-services industry' that its trade publications, such as *Casket* and *Sunnyside*, referred to her simply as 'Jessica.' 'Famous by first name only,' she murmured of this phenomenon, 'rather like Madonna.'"<sup>7</sup>

"Late in life she was asked what sort of funeral she wanted. An elaborate one, she replied, with six black horses with plumes and one of those marvelous jobs of embalming that take 20 years off.' She added that she wanted 'streets to be blocked off, dignitaries to declaim sobbingly over the flower-smothered bier, proclamations to be issued—that sort of thing.'"<sup>8</sup>

In the end, Mitford opted for a simple \$475 cremation. Memorial services for her in London and San Francisco attracted hundreds of mourners. Notables included the likes of Maya Angelou and Salman Rushdie, though funeral industry leaders were sparsely represented.

Mitford got in a final "dig" from the grave, as it were, at arch-enemy Robert Waltrip. A year before her demise, Waltrip, the Chief Executive Officer and founder of Service Corporation

International of Houston, Texas, the largest proprietor of mortuaries in the world, had agreed to a meeting with the muckraker. He pulled the plug, though, backing out at the last minute, greatly disappointing Ms. Mitford. As a parting act of retribution, Jessica had her friends send the bill for her cremation to Waltrip.

But in spite of all her decades of regaling against mortuary conglomerates and funeral practice abuses, one simple, unalterable fact remains—Jessica Mitford died, permanently. And, because she didn't elect the biostasis option, at least one American industry is breathing a sigh of relief.

You and I may not be as prosaic as an Emily Dickinson or a Dylan Thomas. Likewise, we may not possess the intellect of a Sigmund Freud or an Elisabeth Kubler-Ross. And, we probably don't wield the gumption of a Jessica Mitford. Yet, we **DO** have a tantalizing opportunity these remarkable individuals either couldn't have known about or regrettably passed on.

So, before death comes calling on you, "Just Say No!" Read on, and we'll show you how surprisingly simple it can be.

1

#### NOTES

<sup>1</sup> Fiona Jerome, "The Fifty Worst Ways to Die: The End Zone," *Stuff for Men Magazine*, vol. 1, no. 3 (1999): 104-9.

<sup>2</sup> Prof. Elie Metchnikoff, "Studies in Human Nature," *Health: Physical Culture and Hygiene* (December 1903): 408.

<sup>3</sup> Emily Dickinson, "I Heard a Fly Buzz When I Died," in Bradley Sculley, ed., *The American Tradition in Literature*, 3d ed. (New York: Norton, 1956), p. 1019.

<sup>4</sup> Thomas, Dylan, "Do Not Go Gentle into That Good Night," in K. L. Knickerbocker, ed., *Interpreting Literature*, 2d ed. (New York: Holt, Reinhart, and Winston, 1985), p. 532.

<sup>5</sup> Peter Gay, *Freud: A Life For Our Time* (New York: Norton, 1988), pp. 394-97, 401-2, 552-53.

<sup>6</sup> Elisabeth Kubler-Ross, M.D., *On Death and Dying* (New York: Touchstone, 1969).

<sup>7</sup> Molly Ivins, "'Decca' Mitford: Wit, Radical, Muckraker," *San Francisco Chronicle*, July 26, 1996.

<sup>8</sup> *Ibid.*

<sup>9</sup> Robert Bryce, "The Cost of Death: A Review of *The American Way of Death—Revisited* by Jessica Mitford," *IntellectualCapital.com*, October 15, 1998.

# Considering Aesthetics in our highly technological Culture



by Natasha Vita-More

While working on animation that themes aesthetics, I realized that the aesthetics of culture resides in its transparency—its ability to integrate quietly into our reality—our environments, and also into our nervous system. Never mind the fact that aesthetics restructures reality and affects our perceptual patterns. Its hidden value is that we do sense it, even subtly, and even if we don't know what we are sensing.

I sensed a need to finish this project and began to rework the renderings. Smudging the pencil marks and blending a line with my index finger, I noticed the skin on my hand was dry. I put the pencil down and stopped to apply lotion. A drop spilled onto my drawing, but I liked the way it softened the pencil strokes. In one section of the image I had written a notation to return email and to calendar an appointment. I wished that I had 24-hour remote access to the Net, rather than the lame dial-up that I had been using. Never mind, my hands were dry and I needed to complete the stats for the animation I was working on.

*Why do my hands become so dry during the winter months, and why do I need to externally apply lotion when the nanobot located in my cells should be alerting the communications device along my spine to alert my brain that it needs to direct my glands to emit more lubricant?*

Continuing this line of thinking and reflecting on David Gelernter's writing about aesthetics as "the basic ingredient that gives substance and value to great technology,"<sup>1</sup> I put the draft rendering of "Primo 3M+" animation aside for the moment.

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Some may see the social reaction to the stampede of big science and grand technology on the backyard of culture as a massive uproar. I see it as an extended haiku. With an economy of words and a rhythm of brevity, both science and technology's incursion has been to get the job done with as little trim and tapestry as possible. Getting the job done

appears to be more about the mathematics of language and simplicity of design than about communicating its forward hustle.

Smart and functional scientific concepts, technological designs, and artistic visions are basically aesthetic incubators of culture. For aesthetics, as the utmost level of development, achieves a sense of clarity. Aesthetics is also actively played out when experiencing and interacting with our environments. Within this interaction, our perceptions are altered as we come in contact with aesthetics—harmony, skill, truthfulness, and originality—the elegant doors of perception.

In music, when a series of sounds come together to form a composition, the arrangement produces a melody. When the melody contains harmony, rhythm, and timbre, we like to think of it as a unified or stimulating composition. The aesthetics of the composition cause a sense of feeling—excitation, sadness, or joy. Regardless of the emotions we hear or feel, it is the layout of the chords that determine its aesthetics and thus, its music.

Visual design exudes aesthetics by the "graphical elegance [...] found in its simplicity of design and complexity of data."<sup>2</sup> In its most elegant style, visuals can represent or interpret a story by the very placement of a line, shape, or color within its composition. Moving images take it a step further. If you squint your eyes and blur while watching pixels move rapidly, you can see the shapes and colors almost pop off a page or screen. By simply looking at a setting and focusing first on only the color blue and then on only specific shapes or lines, the setting will take on an entirely different meaning or language. Elegant design is found in both simplicity and complexity.

When a project is referred to as not "working," the inference is that the piece lacks functionality and cleverness. This notion carries over onto ideas produced in science when a project is discredited as "pseudo-science" or in technology when "bloat feature" is applied to its design or in the arts when

a project is considered “artsy.” We judge what fundamentally works or does not work by its aesthetic sensibility and its intelligent functionality. Although art and science go through these types of peer pressure drillings, technology has an even rougher time proving itself. Technology is the ardent conduit for communication. With this type of responsibility, it better be pretty darn good.

The purpose of communication is to reach listeners and relay thoughts. For listeners outside a particular cultural haven, the information needs to be presented in a language that they can grasp. Discontinuity in the comfort levels of different cultures and sub-cultures weighs on the communicator who is trying to get the other to pay attention and to comprehend the thought. Similar ideas about design and aesthetics apply to conversation just as do science art and technology—keep it simple and give it meaning.

Artistic designer Piet Mondrian used perpendicular lines and monochromatic colors in his visual images to convey elements of design. His structural layout influenced the Bauhaus and modern architecture. Even from the Eiffel Tower and skyscrapers to Frank Lloyd Wright and Buckminster Fuller, functionality and precision echo the use of aesthetics in technology.

Looking at culture across a wider fabric, there seems to be an imbalance between how much effort is invested in actively pursuing sensory experiences and how much we passively respond to sensory stimuli. Our brains resourcefully sort through the mass of incoming data in a steady flow while filtering its volume in order to keep us from being bombarded. It’s as if the brain’s protective gauge on sensing receptivity is based on elements of graphic design or aesthetic sensibility rather than just a machine doing a job.

We should be very glad for this—it keeps us fairly sane—but it seems that the full enjoyment of our senses is somewhat restricted. Social imprinting on our minds cautiously instructs us to put a stopgap on pleasurable experiences. If there isn’t already an innate psychological auto-turn-off switch, we will be getting one, and not only for the onslaught of data. It will be designed to monitor the quantity and quality of information, assist our thinking with error correction devices<sup>3</sup> and playback for helping us deal with information and our responses to information. But all this pertains to communication and dealing with day-to-day mental business. Just imagine a brain that could direct the flow and flux of incoming data like a film director or musical composer. This type of enhanced reality might produce a walking, talking theater of the mind.

More pragmatically, the aesthetic elegance in designing human senses, which provide a rich experience of the world, can also be applied to biotechnological enhancements and augmentations. For example, designing the layout of nanobots within the architecture of the human body to function as spinal communicators<sup>4</sup> lends itself nicely to the fields of sculpture and music.

Today we view ourselves as information designers and memetic engineers. Each time we express a thought or view we decide if, when, and how to transmit it and to whom it will be

transmitted. Therein, we are like sculptors before a mound of clay or code poets before an algorithmic ode.

Characteristics of future bodies that will resemble the structure of modern architecture are individual expression along with the conscious aim to assimilate current technologies for the purpose of function. The structural elements may even come into focus and be seen from the outside, as in Le Corbusier’s buildings, or maybe not. The nanobots and various communication systems could be concealed within cells and remain a mystery to the outside world. At first, some may see it as sterile or brutal while missing its new aesthetics. As with the Eiffel Tower, the viewing public of the future body may not be willing to accept its materials (nanotechnology, AI, robotics, genetic engineering), and perhaps it will take time for culture to view it as natural or beautiful.

m m m

I first began animating words to images in an attempt to alter viewer perceptions about superlongevity. This digital net.art piece is titled “Aesthetics of Memetic Evolution” (1999). I used a soft shock factor to bring home the fact that every few seconds three people die; how many people could have lived but did not; and how many people could have been cryonically suspended but were not.

After a year’s exhibit, this project evolved into its second generation, “Aesthetics of Memetic Evolution 2” (artists have a tendency for repeating themes and appointing numbers). I conceived an ad campaign comparing a transhuman body to an automobile. The campaign motive was to arouse a sense of play while suggesting that you, the consumer, could purchase a 21st-century human/machine future body.

The third generation became “Primo 3M+ 2001” evolving into a 3D and animated net.art piece. In brief, Primo is a computer graphic image that animated on the Net. Keeping the images streamlined and text as cogent as possible, I relied on Primo’s scientific team to supply substantive data to give Primo some spin.

In writing the comparison chart, I poked a bit of fun at our biology and enjoyed considering what might lie ahead in our highly aesthetic and technological extropic future. 1

Conceptualized and designed by Natasha Vita-More

Collaborating Scientific Team:

Ralph Merkle, Robert Freitas, Max More, Marvin Minsky, Robin Hanson, Michael Rose, Greg Fahy, Vernor Vinge, Greg Benford, Roy Walford, Chris Heward

**Primo 3M+ 2001 can be viewed at  
<http://www.extropic-art.com/primo.htm>**

#### NOTES

<sup>1</sup> David Gelernter, *Machine Beauty*.

<sup>2</sup> Edward R. Tufte, *The Visual Display of Quantitative Information*.

<sup>3</sup> FM-2030, *Are You a Transhuman*.

<sup>4</sup> Robert Freitas, *Nanomedicine*.



### Primo 3M+ 2001 Comparison Chart

20th-Century Human Body	21st-Century Primo 3M+
Limited life span	Ageless
Legacy genes	Replaceable genes
Wears out	Upgrades
Random mistakes	Error correction device
Intelligence capacity 100 trillion synapses	Intelligence capacity 100 quadrillion synapses
Single tracks awareness	Multiple viewpoints running in parallel
Gender restricted	Gender changeability
Prone to environmental damage	Impervious to environmental damage
Corrosion by irritability, envy, depression	Turbocharged optimism
Elimination messy and gaseous waste	Recycles and purifies waste products



## Real Social Security

by Michael R. Seidl

I recently received in the mail my “Social Security Statement” from the Social Security Administration.<sup>1</sup> I am almost 35. I have reported income beginning, with summer jobs as a 16 year old, in 1982. If I were to become disabled tomorrow, I would be entitled to a monthly stipend of some \$900. Upon retirement at age 67, if my earnings continue, I could hope to bring in approximately \$1,800 a month. I would receive medical benefits. My survivor (child or spouse) could receive benefits, and a (staggering) one-time death benefit of \$255 could be paid. Unsurprisingly, these facts do not make me feel particularly secure. If all works as expected, these benefits will provide resources to maintain life at a non-poverty level. However, this system of “social security,” arguably one of the most developed in the world, provides essentially nothing for the conventional disposition of my remains after I am dead.<sup>2</sup> It goes without saying that cryopreservation is not even a consideration of this system. However, from this observation about the failure of “social security” to provide a meaningful death benefit for even traditional burial or cremation,<sup>3</sup> I come to two conclusions: (1) failure to provide for post-death disposition of oneself is systematic and not, as some have suggested, a particular hurdle for the cryopreservation movement; and (2) given our level of technological development and the obvious omissions of social security, the cryopreservation movement has a ripe opportunity to piggy-back itself onto amendments to the Social Security Act to deal with human remains or onto local or state legislation to address similar issues.

As to the first proposition—that many people<sup>4</sup> have a psychological block with respect to the need for preparing for the disposition of one’s own corpse—the simple realization that failure to provide for ones post-death disposition is endemic should be enlightening. If we wish to promote the ideas associated with cryopreservation, we need to do away with the alibi that there is inherently something off-putting or strange about the idea of cryopreservation that is preventing otherwise sensible people from adopting the idea. Let’s be honest. In the abstract, cryopreservation is no goofier than mummification, burial, immolation, or sea burial—all of which have had eras and/or locales of cultural predominance where

their commonality made them seem “natural,” and all of which make enormously less rational sense than recirculating all that protein by eating it<sup>5</sup> or, at a distant and wasteful second, by making it into fertilizer. I do not dispute that cryopreservation seeks to do more than dispose of human remains, but we must not forget that what we have come to see as a medical procedure nevertheless involves one of stages of human existence most traditionally (after sex) saddled with taboos.

In sum, it is not cryopreservation that is alien but anything outside the “ordinary” (as defined by whoever is defining the ordinary at the moment) with respect to disposal of the dead. See footnote 3, above, which describes the disparity in use of cremation. One does not out-rationalize a taboo, or overcome it by suggesting that someone who has internalized it as natural should see it as irrational. We should not hope that we can argue people into cryopreservation when the issue is what will happen to the dead. But seeing the taboo as a cultural construct helps us to see that the barriers to the embracing of cryopreservation are very similar to the barriers that keep certain groups of people wedded to burial over cremation. Alteration cannot be negotiated—it can only (1) be compelled by a conversion experience or (2) be overcome by being raised outside it.

The second path—being raised outside of the construct—is the patient person’s path, indeed, the path of anyone reading this who is under the age of 25. To the extent that we are willing to wait, plenty of people can be raised outside a particular death taboo over generations, just as scientific revolutions occur as new generations supplant the old.<sup>6</sup> To effectuate change through such a program, we do not need to do much but keep the idea out there, secure in the knowledge that eventually an idea that makes economic and scientific sense will seem natural to a new generation to which it is made sufficiently familiar. Part of me is well secure in this idea—all I need to do is wait and, thanks to the gradual churning of the world, what I wish will come to be in due course. This approach is simplistic, of course, and ignores the significant risk that a substantial economic or political upheaval could leave us all melting in the streets or that a fundamentalist revolution could encourage the smashing of many dewars.<sup>7</sup>

Therefore, I cannot, in sound reason, dismiss the need for a methodology for pursuing the conversion experience. However, to accomplish a conversion experience requires something truly extraordinary—a derailment from one's current understanding of the world coupled with a re-railment (if you'll permit me the neologism) upon a new understanding. For many adherents of the cryopreservation movement, I think that conversion experience was reading K. Eric Drexler's *Engines of Creation*. For my part, I had an understanding of cryopreservation gleaned from a *Readers' Digest* snippet I read as a boy, modified by a collegiate understanding that freezing bursts every cell (or most every cell) in the organism, making revival by traditional means impossible—I could not be thawed out and woken up. *Engines* provided a methodology for correcting that damage. But, as I have already said, that rationalism does not seem to work for most people. Perhaps I was susceptible to it because I already disbelieved in a spiritual immortality, had studied cultural theory and seen the taboos associated with bodily disposal as relative and arbitrary, and had hoped for a way out. I do not think that path will work for many.

Instead, I focus upon the unique historical moment in which we live. Industrial and post-industrial society has provided an accumulation of capital whereby social security is, for the first time, a cognizable concept. We define that security, what it constitutes, what it requires. Through a historical omission—perhaps the result of a psychological block—we have created a system that provides a minimum for our survival but nothing (or almost nothing) when we are dead. We did not wish to think about that end, could not bear to begin amortizing the cost of our tombstone with our first part-time job. But the financial wherewithal is there. We live in a society (those of us in the United States, and, indeed, those of us in the European Union and in other post-industrial societies) where a parental, centralized government seeks to provide—and does provide—for a substantial number of our needs.

Why not build cryopreservation into Social Security? The marginal increase in cost would be minimal, almost unnoticeable (perhaps someone with access to an actuarial table will tell me what the cost of a \$50,000 or \$60,000 or \$100,000 whole-life policy is when payments begin with one's first employment and end with retirement age or continue even to be taxed as Social Security payments are now—substantially less than what I began to pay at age 33, I am sure). Moreover, with legislative involvement, cryopreservation would quickly achieve economies of scale that are inconceivable to us now. At the recent Alcor Conference at Asilomar, Steven Valentine mentioned his raising the issue of cryopreservation facilities with city planners. His comment was, for me, a revelation—why not begin our city planners thinking about that now? Indeed, why not do more than raise the issue, why not push—at whatever local, regional, state, or federal level to which we have access, for the construction of such facilities, funded by the government, open to all? Surely any government that will sponsor a sports arena can afford to sponsor a cryopreservation facility given the proper motivation. Surely our collective tax

dollars and/or our Social Security dollars can begin to fund cryopreservation programs that will exceed our hopes. As the adage goes, “each one, teach one”—let us not teach *one* but use the information we have gleaned to provide programs for cities and states.

Our apprehension at this prospect of the normalization of cryopreservation is as understandable as the aversion to cryopreservation by someone fixated upon the burial taboo. Many people involved with cryopreservation are mavericks, iconoclasts, libertarians. We have come to these ideas because we *do not* think like everyone else, do not think in herd mentality, do not follow where our nominal leaders and the state lead. But when new frontiers are opened, eventually the rest of society follows. It seems to me that our question is not whether there will be state-sponsored cryopreservation—either through Social Security, or subsidizing of cryopreservation facilities, or urban planning shaped by foresight—but whether we will shape the institutionalization of cryopreservation or let someone else shape it. We stand at a unique historical moment—private cryopreservation surely has a long and reputable future, just as private hospitals do now—but we have, for the first time, the opportunity to construct an institutional cryopreservation, a cryopreservation that is not a consumer good purchased by a dedicated few but a standardized product offered to all. Do we wish to be the delineators of that standard or to stand by and watch as it is set?

I propose a multiple-approach process. (1) A campaign to modify Social Security to provide a meaningful benefit for the disposal of human remains, into which we may incorporate as equal alternatives burial, cremation, and cryopreservation (and any other means we can include to make the laundry list more egalitarian); (2) a campaign with state and local governments to seek support for cryopreservation facilities through legislation and/or referendum—we need only one successful campaign anywhere in the country to encourage interested parties to vote with their feet and relocate there; and (3) a similar campaign with the federal government to support the same, either through funding a death benefit through Social Security and/or through funding of cryopreservation facilities. We need only to once win the imprimatur of regularity from state or federal government to begin making cryopreservation as ordinary as cremation. The Social Security Act is the first glimmer of real social security—we should be not rogue philosophers and doctors but the first, far-seeing consultants for real social security.

*\*I welcome discussion of these topics: mseidl@magpage.com.*

## NOTES

<sup>1</sup> By way of explanation for readers outside the United States, the Social Security Administration collects taxes from the salaries of almost all working Americans. If a covered individual becomes disabled, he or she is entitled to a benefit.

Upon reaching retirement age (traditionally, 65), “social security” provides every covered individual with a monthly stipend and with Medicare (medical benefits). Coverage is designed to provide a “safety net” rather than creature comforts.

<sup>2</sup> The National Funeral Directors Association estimated, for 1999, that the average funeral bill was around \$6,000 (excluding grave space and a marker, which may add several thousand dollars more to the cost).

<sup>3</sup> Cremation remains decidedly “untraditional” in parts of the United States. The percentage of persons cremated in the United States varies on a state-by-state basis, for reasons that are not entirely clear to me, from a low of 5.35% in Alabama to a high of 59.51% in Hawaii (if we limit to the continental United States, and disregard Hawaii where available land is more limited, the high is the state of Washington, at 57.34%). These differences suggest that death taboos remain very strong even among otherwise culturally homogenous groups.

<sup>4</sup> I recognize that I have generalized from the lacunae in the Social Security Act to an individual lacunae in preparing

for one’s own death. I suspect that figures on individuals who die intestate (i.e., without a will) or without preparation for disposition of their remains will bear this out. If anyone has figures, let me know.

<sup>5</sup> I do not really suggest that cannibalism is survival-positive. I think we would all agree that in an otherwise struggling society—where resources are not unnaturally restricted—a group of people who are absolutely opposed to eating one another is more likely to enjoy long-term survival than a group that treats each other as cattle.

<sup>6</sup> See Thomas S. Kuhn, *The Structure of Scientific Revolutions* (2d ed.; University of Chicago Press, 1970).

<sup>7</sup> I will note, with some trepidation, the fact that cryopreservation has not sufficiently explored sponsorship by a major distiller of Scotch whisky. I, for one, even before becoming involved with the cryopreservation movement, and before learning of Laphroaig single-malt, had hoped to be preserved in Dewars.

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(Affective Computing; *continued from page 41*)

Simpler applications would foreseeably lead to more sophisticated ones; robots, for instance, that attempted to fulfill our wishes in many different ways. This, however, would raise the issue of a system that, to bring about great benefits, might need discretionary powers that would also enable it to do great harm if it felt so inclined, with no way to guarantee that it would not. This issue is treated in a chapter titled “Potential Concerns,” and the author notes that speculative writing has already treated it at length. (Examples are seen in Asimov’s “three laws of robotics,” where robots must avoid harming humans no matter what, and in the movie *2001*, where this principle is chillingly violated.) But there are no easy answers, as the author concludes, and we must be careful, always attempting the best by way of tradeoffs, a problem that will become more acute with the growing powers of our artificial minions.

So far I’ve said nothing about just how emotions are to be captured or simulated in a computer. In fact some eighty pages, nearly a third of the book, is taken up with this important if more technical topic. There is no single, dominant theory but a number of approaches from which the reader can pick and choose. Generally, emotions have valence (positive or negative) and intensity, attributes amenable to numeric modeling. A system then becomes devoted to optimizing certain state variables, and this behavior is able to meet the requirements of having and expressing emotions. If this seems counterintuitive, it should not. Feelings can be viewed as a way of simplifying the complex decision process an organism must be involved in to survive. We eat because we are hungry, not because of some complicated analysis of our metabolic needs, something that

would be hard enough for us and impossible to other creatures that also must eat to live. It is easy in turn to see how “hunger” could be modeled numerically in a battery-powered robot that would search with increasing urgency for a recharging terminal as its reserves ran low. (We could, for example, define “hunger” as the reciprocal of the remaining battery charge and bias the robot’s behavior accordingly; the hungrier it got the more likely it would be to focus on this one problem.) More complicated behavior, involving more sophisticated emotions, could also be handled through mathematical modeling; here as elsewhere it’s expected that techniques will improve with time.

Generally this book can be viewed as an introduction to a subject that is still in its infancy. Definitive answers are not to be expected but, again, useful insight can be had. A couple of thoughts seem appropriate here. One is that affective computing may be necessary to speed work on hard problems we’d very much like solved as immortalists, such as advances in medicine and nanotechnology. The book does not deal with these areas but does note that human-level problem solving involves emotions, even in “unemotional” but challenging fields such as pure mathematics. Second, I see an application for affective computing at a more mundane but still important level, involving computer systems that are necessary to a cryonics operation. Automation, when used in perfusions and cooldowns (as it is at Alcor), should be as crash-resistant as possible. This I think could be abetted by putting what amount to emotions into a system so it will know how to assign priorities in case glitches develop. It must not, for example, halt execution or start a runaway nitrogen fill because of a bad temperature reading. I think also that affective computing will be useful in the long-term monitoring of patients in storage.

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## Progress and Caveats

Much of the present report concerns progress in biotechnology, ranging from new findings about aging mechanisms to a killer virus made by mistake. Other advances relate to nanotechnology more generally, and a person-machine interface in the form of an artificial retina.

### Antiaging Progress.

As immortalists we are seeking the end of that great, traditional killer, the aging process. Among other things we must find a way to extend the maximum human life span beyond its present total of about 120 years. Up to now about the only way of possibly doing this was by calorie restriction, an unpleasant regimen that works in mice and some other shorter-lived organisms. It could offer similar benefits to humans, though whether it actually would is unknown. Also unknown was why calorie restriction works at all. Now it appears that light has been shed on the latter question, and a means could be at hand for life extension without starvation. Two recent developments support these optimistic judgments, one involving yeast cells, the other, fruit flies. Despite the differences between these organisms and humans, there are enough basic similarities to raise hopes.

The work with yeast, which appears to be the more advanced of the studies, suggests a definite mechanism for life extension that involves competing biochemical processes. Nicotinamide adenine dinucleotide or NAD is a substance that is used in glucose metabolism—a basic process for energy generation in the cell. But it is also used by a “silent information regulator” gene, *sir2*, to suppress unwanted gene expression of the sort that occurs increasingly as the cell ages, impairing its function and shortening its life. When food is plentiful, it appears that more of the NAD is used for metabolism, leaving less for the *sir2* gene in its life-extending work. A hungry cell, on the other hand, will have less need of NAD for metabolism so that more is available for staving off aging. But if this is true, simply supplying the cell with extra NAD should achieve the life-extending effect without the necessity of starvation. To directly supply extra NAD is difficult at this point, but a somewhat roundabout test, reported by principal researcher and MIT biologist Dr. Leonard Guarente, supports the theory. It is noted that calorie restriction does extend the life span of normal yeast cells—but if the principal gene for manufacturing NAD is disabled, the effect disappears. Guarente is now trying to extend his results to animal species such as roundworms and mice.

In the other study, directed by Dr. Stephen L. Helfand of the University of Connecticut Health Center, a gene modifica-

tion has nearly doubled the life span of fruit flies, apparently by reducing their metabolism at the cellular level. Normally the gene, which is whimsically named “indy” for “I’m not dead yet,” exists in two copies in each cell. Interestingly, modifying both copies of *indy* shortened rather lengthened the life span, suggesting metabolism was reduced to the point that the fly starved to death, even though, as usual, its access to food was unrestricted. This, then, suggests another way of achieving the life-extending effect of dieting without having to reduce one’s food intake. (Of the two, however, I think I’d prefer the first—extra metabolism appears to confer some benefits such as providing an energy reserve of body fat to help counter illness and injury.)

### Killer Virus Made by Accident.

Sometimes “progress” comes in forms you didn’t wish for, reminding us that we must be ever careful as we approach what will, we hope, be a better-than-human condition. One such incident occurred recently at the Cooperative Research Centre for the Biological Control of Pest Animals at Canberra, Australia. Gene engineers at CRC were working with the mousepox virus, which is similar to human smallpox, as part of an effort to develop a biological contraceptive for rodent control. (This in turn could halt mouse and rat plagues that threaten the global food supply and spread diseases.) Normally the effects of mousepox are mild, and researchers modified a gene of the virus expecting to make a benign carrier of interleukin-4. This, they thought, would stimulate antibody production in female mice to destroy their egg cells and render them infertile, but would not otherwise have profound effects. Instead the new virus killed every one of its hosts after first disabling their immune systems. It is also surprisingly resistant to vaccines. Though there is no immediate threat to humans, it raises the disturbing possibility of a similar modification to smallpox (now extinct in the wild but preserved in two laboratories worldwide) or other viruses known to infect us. CRC director Bob Seamark noted that the work was carried out for purely humanitarian reasons, which seems justification enough for continuing it, though of course with due precautions.

### Cloned Endangered Gaur Dies.

Forty-eight hours after he was born on January 8, Noah, a cloned specimen of the gaur, a rare wild ox, died of a common bacterial infection. He was the first animal to be made by placing the DNA of one species in an egg cell of another (in this case, a cow) and, also, the first cloned representative of an endangered species. Scientists at Advanced Cell Technology in Worcester, Massachusetts, where the work was performed,

were still optimistic that the procedure could help save endangered species and also resurrect extinct ones whose remains are well preserved.

### **Immune Cells Made to Attack Leukemia.**

Recent, impressive steps in the war against cancer have been taken by engineering killer T-cells, an important component of the body's immune system, to specifically attack leukemia cells. Clinical trials are about to start in the UK. Credit for the work goes to a research team headed by Hans Stauss of Imperial College, London. They found that a certain gene, WT-1, is over-expressed in the leukemia cells and were able to develop a line of killer T-cells sensitized to the protein encoded by WT-1. Tests on leukemic animals and with blood of human sufferers show that the leukemia cells are eliminated while other cells are unharmed. Best of all, the WT-1 gene is also expressed in other cancers such as breast and lung cancer, suggesting this approach could be useful for these cases too. Clinical trials are expected to take two years.

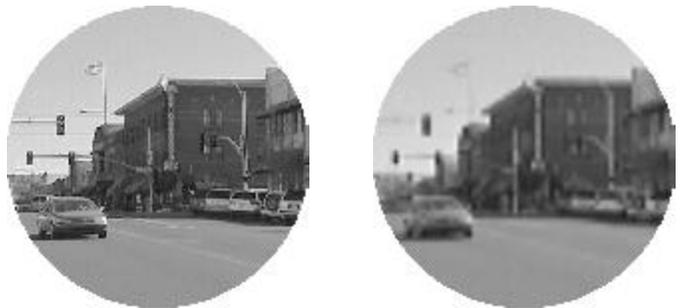
### **Aerosol to Speed Drug Delivery for CF Patients.**

Cystic fibrosis (CF) is an inherited (genetic) disorder in which thick mucus secretions build up in the lungs and digestive system, interfering with the body's function, stunting growth, and shortening life. Improvements in managing the disorder have greatly increased the life expectancy of victims, though it is still less than thirty years, with no known cure. Drugs able to alleviate some of the symptoms can be delivered by inhaling aerosols but such therapies are limited because many areas of lung tissue, particularly the smaller but important, peripheral airways, are partly clogged with mucus and hard to reach. A new technique developed by Dr. Beth Laube and colleagues at Johns Hopkins University promises to diminish this problem by using smaller aerosol particles. The tiny salt water droplets, about one micrometer in size or nearly four times smaller than before, are found to have better penetrating power and, moreover, to be controllable. Inhalation of the particles at high flow rates resulted in deposition in the larger, central airways, much as with the large particles, but with low flow rates deposition was markedly shifted toward the peripheral areas, while the large particles continued to deposit in the central areas as before. This offers both to increase the effectiveness of drug therapies and lower the cost, since less of an expensive drug will now be needed to achieve the same effect. In the future the method might also be useful in delivering gene therapy, leading to longer lasting benefits and possibly a complete cure.

### **Artificial Retinas.**

For the first time ever, an artificial retina has been implanted with the intention of giving sight to the blind. On June 28 and 29 last year, three patients who were nearly blind from retinitis pigmentosa received retinal implants consisting of the tiny computer chips. Each chip is an array of solar cells designed to assume the function of the natural photoreceptors that had been destroyed by the disease. Minute electric currents are

produced by the cells when light strikes them, and the currents then stimulate the underlying nerve structure of the eye, so that some level of vision is restored, as confirmed in animal tests. The chip is only about a thousandth of an inch thick, which makes it feasible to implant it slightly underneath the retinal surface, for a better interface with the underlying nerve tissue. And, because it is solar-powered, it is self-contained and requires no batteries or connections to an outside power source. So far the patients are said to be tolerating the implants well, with no major complications. The main results will not be disclosed until the pilot study is completed, said Dr. Alan Chow, principal researcher and CEO of Optobionics, the Wheaton, Illinois-based company that developed the chip. A larger version, a two-millimeter disk with about 3,500 cells or resolution elements, will be tested if the study goes as planned. Though it will not restore unimpaired vision, if it works as hoped it should make it possible for otherwise blind people to get around without canes or guide dogs.



With only about 3,500 resolution elements, the image on the right shows loss of detail but would still be far better than blindness.

### **Nanite Motors.**

Two recent advances bring us a little closer to fully motorized nanotechnology. The first is a microbe-sized motor that spins a tiny metal propeller at up to eight revolutions a second. The motor draws its energy from the same organic molecules that power living cells. "This is the first true nano machine," says Cornell's Dr. Carlo D. Montemagno, senior author of a recent paper in *Science* describing the device. In the second advance, also described in the same issue of *Science* (Nov. 24 last year), a tiny island of tin moves of its own accord over a copper surface, leaving a trail of bronze alloy in its wake until finally all the tin is consumed. The explanation is that copper atoms are continually being exchanged for larger tin atoms, making small swellings on the surface that push the remaining tin aside. To one of the researchers, Dr. Norman C. Bartelt at Sandia National Laboratories in Albuquerque, the motion suggests a roving, grazing animal. "It's amazing an inanimate system on such a small scale emulates something that's living," he comments. Though it isn't clear how this behavior can be harnessed, a possible use would be to push other tiny objects into position as part of an assembly process.

## Progress with Quantum Dots.

One example of nanotechnology with great potential for benefit is a computing device based on quantum dots. Such a device confines electrons in tiny pockets or wells ("quantum dots") so that only a few states are allowed to each electron under the laws of quantum mechanics. Information is stored and processed by enforcing particular patterns of states on the confined electrons. The minute scale of the system, coupled with its reliable performance, could be a solution to the problems encountered in conventional computers as components are progressively miniaturized. Quantum dot architecture could also be used in constructing a quantum computer, which seems to exploit parallel universes and is exponentially faster than a conventional or binary computer on some problems. (Conven-

tional computers store information in one definite pattern of states or another at a given time, while a quantum computer allows many patterns at once. Quantum dots could be used to construct either type of device.) Researchers at the University of Nebraska have recently developed a new quantum-dot architecture they say is five hundred percent better than its nearest competition. The research team of six, headed by Supriyo Bandyopadhyay, has won a University of Nebraska patent for a method that constructs vast arrays of the new quantum dots on an aluminum substrate. The method uses an electrochemical process that is inexpensive and easy to perform but finicky nonetheless. Bandyopadhyay predicts it will take five years to perfect, and also that quantum computers will start to replace binary computers before the end of the decade. 1

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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](http://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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