

CRYONICS

The Alcor CryoTransport Program

4th Qtr. 2000 A PUBLICATION OF THE ALCOR LIFE EXTENSION FOUNDATION Volume 21:4

Vitrification Arrives!...4

New technology preserves without ice damage

Tribute to FM-2030...10

Remembered by friends and colleagues

Alcor Conference.....18

Second installment on Asilomar conference

"The Fear of Death....23

and Its Implications for Cryonics"

For the Record.....28

"The Mystery of the Non-Signups"

Lemler Column.....31

"You Only Go Around Twice"

First Thoughts.....32

"Blasé About Cryopreservation"

Alcor Update.....35

New marketing activity & vitrification cost report

BioTransport Update....45

Upgrading capabilities & new company Cells4Life

Book Reviews.....52

Up-Wingers and Consciousness and Human Identity

ISSN 1054-4305

\$7.50



**Vitrification Arrives!!
see page 4**

SOURCE	FEATURES	PAGE
Fred Chamberlain	Vitrification Arrives!	4
Various Authors	Special Section: Tribute to FM-2030	10
Fred Chamberlain	Asilomar Conference (part 2)	18
Robert Newport	The Fear of Death	23
Fred Chamberlain	Update on BioTransport, Inc.	45
Jennifer Chapman	What Is the Insurance Buy-Back Agreement?	49

v Columns v

For the Record: The Mystery of the Non-Signups.....	28
You Only Go Around Twice	31
First Thoughts on Last Matters.....	32
Book Reviews: <i>Up-Wingers</i> and <i>Consciousness & Human Identity</i>	52
TechNews.....	55

Alcor update - 35

Higher Level of Marketing Activity	35
How High Could Vitrification Costs Go?	43
Alcor Membership Status	44

lifequest - 59

GENTLE INTO THAT, GOOD KNIGHT by Thomas Meyer.....	59
WHY NOT? by Fred Chamberlain.....	63
GRANDPA CHIPPERS by Linda Chamberlain.....	66

Alcor: The Origin of Our Name

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

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

the need for a rescue team or even for cryonics itself. Symbolically then, Alcor would be a "test" of vision as regards life extension.

As an acronym, Alcor is a close if not perfect fit with *Allopathic Cryogenic Rescue*. The Chamberlains could have forced a five-word string, but these three seemed sufficient. *Allopathy* (as opposed to *Homeopathy*) is a medical perspective wherein *any treatment that improves the prognosis is valid*. *Cryogenic* preservation is the most powerful method known to halt the rapid, entropic disorganization of people following clinical death. *Rescue* differentiates a cryonics approach from (yet to be developed) proven suspended animation. The acronymic interpretation of Alcor is therefore *use of a cryogenic procedure, though unproven, to preserve structure and potential viability, since failing to do so allows further disorganization to occur and reduces the probability (prognosis) of reversal and reanimation at any future time*.

Some of these thoughts were presented at a CSC dinner meeting in the autumn of 1970. A number of people who have subsequently become members of the Alcor Life Extension Foundation were present at that gathering. Over the months that followed, it became 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*
(August 1984).



cryonics is a quarterly publication of the Alcor Life Extension Foundation

Editor

Lisa L. Lock
llock@winterthur.org

Associate Editors

Fred & Linda Chamberlain
fred@alcor.org
linda@alcor.org

Volume 21:4

4th Qtr. 2000

ISSN 1054-4305

Contents copyright © 2000 by the Alcor Life Extension Foundation, except where otherwise noted. All rights reserved. The opinions expressed herein are not necessarily those of the Alcor Life Extension Foundation, its Board of Directors, or its management.

Submissions may be sent via e-mail (fred@alcor.org or linda@alcor.org or llock@winterthur.org) in ASCII, Word, or PageMaker format. Mailed submissions should include a PC diskette with the file in any previously mentioned format (although printed text alone will be considered). All submitted media become property of the Alcor Life Extension Foundation unless accompanied by a self-addressed stamped envelope. The Alcor Life Extension Foundation assumes no responsibility for unsolicited manuscripts, photographs, or art. Send all correspondence and submissions to:

Cryonics Magazine
Alcor Life Extension Foundation
7895 E. Acoma Dr., Suite 110
Scottsdale, AZ 85260

about the cover

CGI art by Tim Hubley

You Asked for Greater Membership Growth ...

Here Is Your Opportunity to Help ‘Make It So!’



The Robert Miller family, Alcor members who live in Canada, recently made a generous donation of \$100,000 for the extraordinarily important purpose of developing a marketing program that will increase Alcor's membership.

Now, we are asking you to join the Millers' gesture of support and their confidence in our future by adding your own contribution to this important membership-building campaign. Your dollars will enable us to communicate our story in a positive and compelling manner, develop marketing materials that will reflect Alcor's professionalism, and create a presence at important meetings where we can exchange information with scientists from around the world.

We have set our goal at the \$200,000 level for the year 2000. With your help, we will quickly reach this important milestone. If you agree that we need to build the Alcor membership, for greater strength and safety, now is the time to give a contribution that will truly make a difference.

Donations of more than \$1,000 will receive honorable mention in the pages of this publication. We ask you to help support what the Miller family has started by adding your own contribution.

If you need tax deductions for the year 2000, this is the time to take such a deduction and make a major contribution toward your own long-term survival at the same time!

Help make all of this possible! Send your donations for the marketing project today.

Please send your marketing donations (checks made payable to "Alcor") to Linda Chamberlain, Alcor Life Extension Foundation, 7895 E. Acoma Dr., Suite 110, Scottsdale, AZ 85260

Letters to the Editors

Letters to the editors are most welcome on all topics, including counterpoint on previously published materials and suggestions as to future content. We especially invite questions about cryotransport (cryonics) that are original and far-reaching.

If you are seeking information

about Alcor, please consult our web site, at www.alcor.org. If you have questions about developmental programs within Alcor, you may stir us into talking about them even sooner than we might have otherwise.

If your letter is lengthy and involved, we may use it as a sepa-

rate article and may ask you to expand it. We need your ideas, your personal visions. This is the place to start.

Please send letters and/or articles to:

fred@alcor.org,
linda@alcor.org, or
llock@winterthur.org.

Vitrification Arrives

New Technology Preserves Patients without Ice Damage

by Fred Chamberlain
President/CEO, Alcor



The below discussions of vitrification and its possible implications for Alcor's membership services and funding are controversial. They do not as yet reflect positions, resolutions, or other decisions by the Alcor Life Extension Foundation Board of Directors. When such decisions are reached, Alcor's members will receive them promptly.

Details of the technical aspects, to the point of specific phraseology, are largely supplied by researchers involved, yet their names do not appear here. This is not a report of scientific findings; rather, it is a statement of steps being taken toward applications of new technologies by Alcor and BioTransport, Inc.

With those reservations, read on. For years, we have been waiting for the day when ideas such as these could appear in Alcor's publications. That day is here!

* * * * *

Effective immediately, neuropatients will no longer be frozen by the Alcor Life Extension Foundation. This does not mean that Alcor is closing down! Rather, Alcor will now use a method of preservation that has never before been used in cryonics. Specifically, Alcor will now vitrify neuropatients instead of freezing them. There are limits, of

course. Any delays in starting the procedure or other compromise may mean damage that is not easily reversible.

Vitrification is a method of stopping biological time that does not involve freezing. It is a method of converting biological tissue into a low-temperature glass that does not contain any damaging ice crystals. Vitrification was first proposed two decades ago by cryobiologist Dr. Gregory Fahy as a method for cryopreserving complex tissues such as whole organs. The motivation for vitrification was that conventional freeze preservation invariably destroyed organs by disrupting sensitive tissue structures with ice crystals. Reversible vitrification has since been demonstrated on embryos, ova, ovaries, skin, pancreatic islets, and, most recently, intact blood vessels for transplant. Recent breakthroughs in the field suggest that reversible vitrification of whole mammalian organs may also be achieved in the near future.

Freezing vs. Vitrification

When water is mixed with antifreeze chemicals (cryoprotectants) and is frozen, it becomes filled with millions of tiny ice crystals. If a biological tissue is being frozen, these ice crystals tear cells

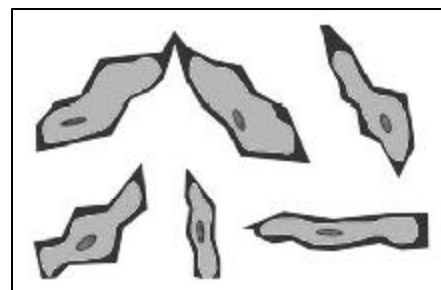


Fig. 1a.

apart from each other (Fig. 1a), destroying the normal, organized structure of the tissue. Adding a high concentration of cryoprotectants can limit the amount of ice that forms during freezing so that less disruption occurs (Fig. 1b). This has been the approach used by Alcor for the past decade.

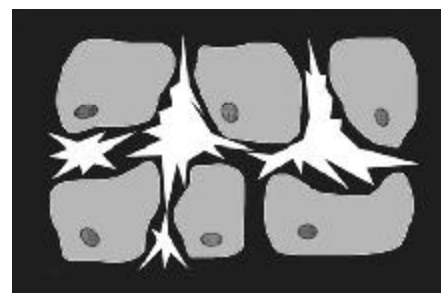


Fig. 1b.

Unfortunately, even freezing with high cryoprotectant concentrations still causes serious structural damage. Figure 2a shows a transmission electron micrograph of a canine brain treated with 7.5 Molar

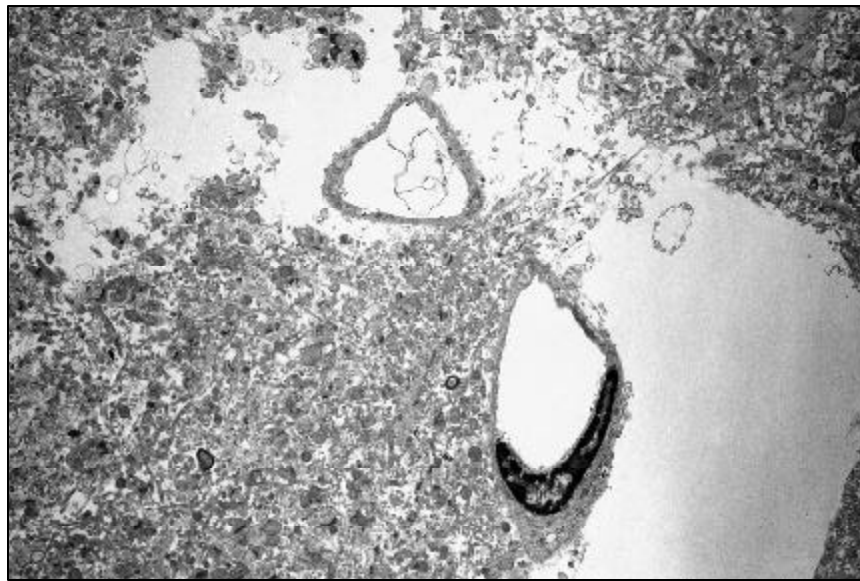


Fig. 2a

glycerol, frozen, and then thawed. Numerous voids are present on a cellular scale where ice crystals formed and then melted. Furthermore, glycerol becomes freeze-concentrated in the areas between ice crystals, resulting in fatal cellular toxicity. This combination of structural damage and toxicity makes recovery of frozen neural tissue impossible with current technology.

Vitrification offers a solution to these problems. If a very high concentration of cryoprotectant is rapidly cooled, the mixture can cool to any temperature without forming ice. Water molecules simply don't have time to find enough of one another among the cryoprotectant molecules to form ice. The water/cryoprotectant mixture just becomes more and more viscous, like cold syrup. Finally, at temperatures below the "glass transition" temperature (typically near -120°C), the mixture solidifies into a hard glass. This is vitrification. If cells and tissues are saturated with the mixture, they are incorporated into this glass like an insect in amber and can remain stable indef-

initely. Unlike an insect in amber, even the cytoplasm inside cells

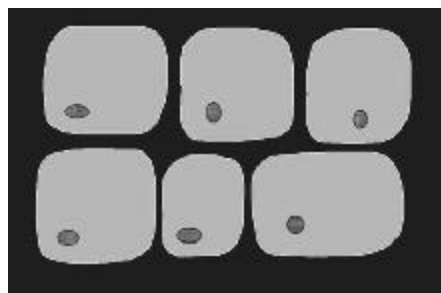


Fig. 1c

turns to glass so that biological time is truly stopped.

The biological difference between freezing and vitrification is

striking. Vitrification essentially stops biology "in place" (Figure 1c) without any structural damage. Figure 3 shows rabbit kidneys that have been frozen (left) vs. vitrified (right). Both kidneys are at a temperature of -130°C , and are rigid solids. Yet the vitrified kidney looks essentially normal. The electron micrographs of Fig. 2 show the difference between brain tissue that has been cooled to -80°C and then rewarmed after treatment with a freezing solution (2a) vs. vitrification solution (2b). The brain treated with the vitrification solu-

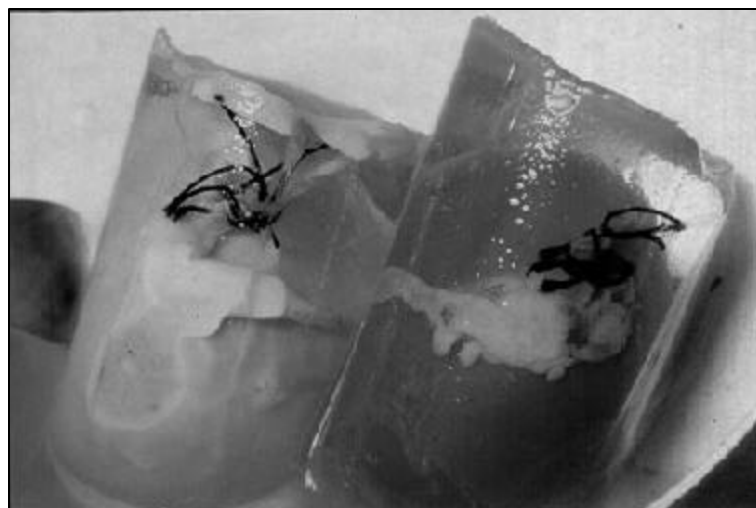


Fig. 3

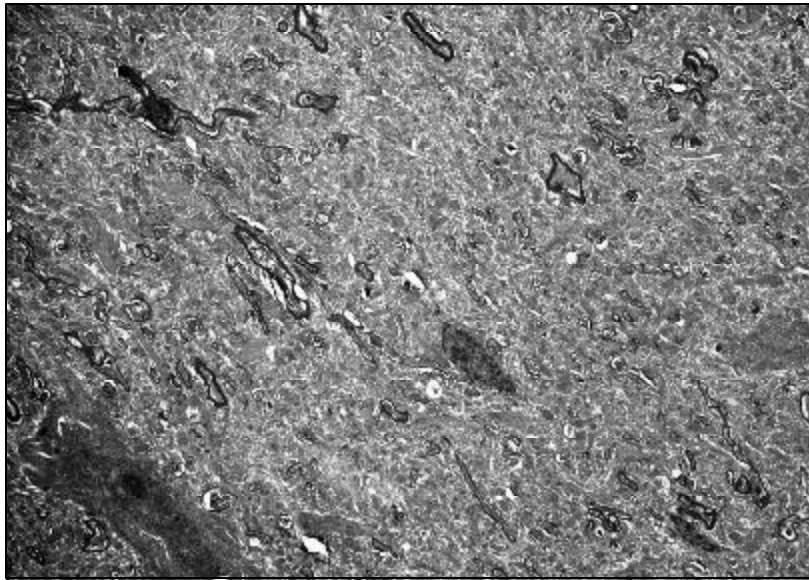


Fig. 2b

tion shows essentially no structural disruption except for mild, reversible dehydration. Published “freeze substitution” electron micrographs of vitrified blood vessels confirm that cooling all the way to -130°C results in no structural damage to tissues treated with vitrification solutions.

Recent Breakthroughs

The primary problem with vitrification that has prevented widespread application is cryoprotectant toxicity. Small systems such as embryos and heart valves can be cooled and rewarmed rapidly, which reduces the concentration (and toxicity) of cryoprotectants required to achieve vitrification. Large systems with slow heat transfer, such as organs, require toxic concentrations of cryoprotectants to achieve vitrification. For objects as large as cryopatients, heat transfer is so slow, and the necessary cryoprotectant concentrations so large, that a vitrifiable concentration of glycerol cannot even be perfused into cryopatients due to viscosity limitations.

Three breakthroughs have

occurred within the past two years that dramatically change the prospects of successfully vitrifying large systems. First, scientists conducting conventional organ preservation research at 21st Century Medicine, Inc. (21CM), have discovered new cryoprotectant mixtures with drastically reduced toxicity compared to previously known solutions. Second, 21CM has also discovered chemical additives (“ice blockers”) that significantly reduce the concentration of cryoprotectants required for vitrification. Third, Alcor itself has developed a new method for external cooling of cryopatients that cools neuropatients approximately ten times faster than previous methods. These developments now appear to make possible what was previously only dreamed of: *complete ice-free preservation of cryopatients*.

21CM has licensed a variant of their new low-toxicity vitrification formulas to BioTransport, Inc., for use with Alcor cryopatients. The Hippocampal Slice Cryopreservation Project, conducted by the Institute for Neural Cryobiology (INC) in cooperation with 21CM,

recently showed that a similar cryoprotectant formula permitted the vitrification and rewarming of rat hippocampal brain slices with a viability equal to 53% of untreated controls. While the formula that will be used on cryopatients is more concentrated than the one used in these experiments, there is still good reason to believe that partial viability of brain tissue will be retained during cryopatient vitrification. There is no question that the viability will be higher than what is now being achieved with glycerol. The new vitrification procedure to be used on cryopatients will therefore eliminate structural injury and increase cellular viability at the same time.

Optimum Storage Temperature

Vitrified systems will fracture (break into pieces) if cooled to liquid nitrogen temperature (-196°C). Fracturing is also known to occur in conventionally frozen patients during descent to liquid nitrogen temperature. With frozen patients this has not been a concern because the damage caused by ice crystals is much more severe than

the damage caused by fracturing (both will require advanced nanotechnology to fix). However, vitrified patients do not have ice crystal damage, so fracturing becomes the sole structural damage mechanism. If fracturing can be avoided, vitrification provides a means of achieving perfect structural preservation of cryopatients.

Fracturing of vitrified systems can be avoided by not cooling far below the glass transition temperature. This implies a long-term storage temperature somewhere between -130°C to -150°C . Holding temperatures too close to the glass transition causes nucleation of ice to slowly proceed on the molecular level, which will cause problems with ice growth when it is time to rewarm the system. Storing too cold increases the risk of fracturing. The risk of fracturing can be reduced by "annealing" (holding for long periods at temperatures slightly above the target temperature). Protracted annealing might even permit fracture-free storage at liquid nitrogen temperature, but much research remains to be done. In the meantime it will be safest to hold patients ten to twenty degrees below the glass transition temperature.

Concern has sometimes been expressed about the safety of intermediate temperature storage systems. Freezers that operate at temperatures down to -140°C are off-the-shelf commercial items routinely used for storage of cryobiological material. But what happens if there is a mechanical breakdown or power failure? Units are available (such as the Harris CryoStar freezer recently purchased by BioTransport for use by Alcor) with a liquid nitrogen backup capability so that a pressurized liquid nitrogen source can maintain temperature. A standard 230-liter liquid

nitrogen cylinder should provide at least 24 hours of backup. Alternatively, the large, pressurized liquid nitrogen reservoir recently installed at Alcor could provide days of backup. In any case, it is clear that sufficient freezer capacity must exist to take individual freezers offline for maintenance when necessary. The same is true for cryogenic dewars holding liquid nitrogen. Cryogenic dewars can also fail catastrophically (with loss of vacuum) and exhaust their nitrogen load within hours. Robust backup systems and procedures must be in place regardless of the specific storage temperature or technology used to produce it.

It's also possible to contemplate hybrid systems that use dewar technology to hold a reservoir of liquid nitrogen at the bottom of a dewar to maintain an intermediate temperature in the vapor space above the liquid. These systems will have to be custom-built and require significant research and development. Unfortunately, the need for custom development appears unavoidable because existing commercial freezers are not large enough to accommodate whole-body patients, or to store neuropatients with good economies of scale.

For the immediate future, Alcor plans to store vitrified neuropatients at liquid nitrogen temperature. Options for fracture-free storage will be made available as soon as appropriate costing and backup plans are developed. We do not want to delay introduction of this technology. Even with storage in liquid nitrogen, vitrification is still far superior to freezing.

No More Nanotechnology?

For three decades the practice of cryonics has been based on the need for almost unimaginably ad-

vanced repair technologies. These technologies came into clearer focus in the 1980s with the proposition of molecular nanotechnology by Eric Drexler. Ralph Merkle, Robert Freitas, and others built on Drexler's foundation to examine specific technical questions concerning the reversibility of cryoinjury by nanotechnology and concluded that mature nanotechnology implies very broad (almost arbitrary) capabilities for reversing freezing injury in the future. Whether extensive repair of freezing injury would result in full recovery of a cryopatient is a more uncertain question given current limited knowledge of the neurological effects of freezing injury. Even if freezing injury is completely repaired, conceivable outcomes range anywhere from full recovery to restoration of an amnesiac clone. The same limitations apply, of course, to patients who are vitrified after ischemic episodes with biological damage that is presently irreversible.

In cases where vitrification can be applied to high viability patients, these questions are moot. Vitrification removes all damage mechanisms of cryopreservation and leaves only one: cryoprotectant toxicity. No more nanoscale excavation of ice. No more "inferring the original structure" from debris. No more nanocomputers and nanomachines operating at deep subzero temperatures. In fact, no more nanomachines at all. The molecular mechanisms of cryoprotectant toxicity are still unknown, but there are good reasons to believe that a limited number of targets are involved. With no structural damage to contend with, treating toxicity in cells that are already partially viable is a problem of advanced pharmacology, not advanced nanotechnology. Vitrified tissue (without

fractures) simply needs to be rewarmed, cryoprotectants removed, and treatment initiated under physiological conditions.

Even restoration of neuropatients to wholeness is not intrinsically a problem for nanotechnology. Recent developments in neural tissue regeneration and nuclear transfer technology (therapeutic cloning) show that tasks previously thought impossible without nanotechnology can often fall into the realm of simple biotechnology. In-vitro growth of replacement tissues and organs around an isolated central nervous system is certainly conceptually feasible without molecular nanotechnology. Nature has been producing new tissues and organs from single cells for eons without nanotechnology.

Some cryonics advocates assert that nanotechnology is “necessary and sufficient” for revival of cryopatients and on this basis argue that preservation technology isn’t very important. Yet as preservation technology continues to improve, certainly a day will come when better preservation will make a clear difference in time-to-revival and probability of success. Under favorable conditions, that day may well be today. Nanotechnology provides a powerful view of the limits of the possible and a persuasive argument for why cryonics must, to some extent, ultimately succeed. But it should not encourage complacency about preservation technology. The repair requirements of vitrification are so drastically different from freezing that the two procedures cannot be considered equivalent, even with access to nanotechnology.

Costs and Benefits

Alcor will initially perform vitri-

fication of neuropatients (“neurovitrification”) *without* increasing funding minimums, for those presently having arrangements. If the increases to cost are modest, we hope to continue performing neurovitrification and storage in liquid nitrogen without requiring any modifications in existing member funding. However, an increase to funding for new members with neuro arrangements may be required, under which existing members would be “grandfathered” as in the past. No decisions have as yet been reached about the increases that may be made or the dates for the changes.

It is important to realize that due to the widely varying conditions under which members come into Alcor’s care, it may not always be possible to perfuse sufficient cryoprotectant to achieve vitrification. In cases where vitrification is not possible, members will be conventionally frozen. However, with new surgical techniques recently pioneered at Alcor for avoiding clots in large vessels and other complications, we are hopeful that vitrification will be possible even after substantial post-mortem delays.

Alcor will make an option for fracture-free vitrification storage available in the near future, pending finalization of costing and backup contingency issues. This storage will be performed in modified BigFeet (large cryogenic dewars now in service at Alcor, holding four whole-body patients and five neuropatients, which are expected to accommodate 40 neuropatients after modification for fracture-free storage). Considerable development work will be required on an urgent basis and is expected to be carried out under a grant proposal now in preparation. The com-

plexity of monitoring and operating this system will be greater than for liquid nitrogen immersion of neuropatients, but this may be offset by lower heat flow at the somewhat higher cryogenic temperatures. Increases to the funding requirements for new neuropatient members might make this upgrade available to existing members without changes to their funding requirements. We anticipate more definite answers to be announced by January 2001.

Whole-Body Vitrification

Alcor regrets that vitrification is not yet available for whole-body patients. The present container system used for whole-body patients is not compatible with the rapid cooling rates necessary for vitrification. A new closed container system with accommodations for circulating coolant will have to be developed. Development of the total system will require months of work and tens of thousands of dollars. Funding for this work is being sought on an urgent basis, through a grant proposal, along with funding for development of fracture-free storage systems for vitrified whole-body patients.

Only neuropatients will be able to benefit immediately from this quantum leap in technology, and then they are likely to be the first to benefit from a fracture-free storage system. With this in mind, members who are signed up for whole-body preservation might consider switching to neuro until whole-body vitrification becomes available (for more details, see pages 37 and 43). Members wishing to financially support the construction of new

hardware permitting whole-body vitrification, or fracture-free whole-body vitrification, should contact Alcor. Progress will definitely be more rapid if any grant funding obtained is supplemented by additional donations.

A New Era

The advent of vitrification might well mark a new era in the public perception of human cryopreservation. A successfully vitrified patient is not a frozen patient. All the tired clichés about “freezer burn,” “bursting cells,” and revival being equivalent to recovering “cows from hamburger” fall into irrelevance. Scientific critics will now be forced to examine what vitrification is rather than resorting to pat analogies concerning frozen tissue or even frozen food (!) Off-hand disparagement must become discussion on the merits. The scientific debate of cryonics will be elevated to a new level. For under ideal conditions, vitrification is so qualitatively distinct from past practice that perhaps it shouldn’t even be called “cryonics” anymore.

1

Selected References

“Freezing of living cells: mechanisms and implications,” P. Mazur, *Am J Physiol.* **247**, C125–142 (1984).

“Vitrification as an approach to cryopreservation,” G. M. Fahy, D. R. MacFarlane, C. A. Angell, H. T. Meryman, *Cryobiology* **21**, 407–426 (1984).

“Ice-free cryopreservation of mouse embryos at -196 degrees C by vitrification,” W. F. Rall, G. M. Fahy, *Nature* **313**, 573–575 (1985).

“Physical problems with the vitrification of large biological systems,” G. M. Fahy, J. Saur, R. J. Williams, *Cryobiology* **27**, 492–510 (1990).

“Vitreous cryopreservation maintains the function of vascular grafts,” Y. C. Song, B. S. Khirabadi, F. Lightfoot, K. G. Brockbank, M. J. Taylor, *Nat Biotechnol.* **18**, 296–299 (2000).

“Vitrification enhancement by synthetic ice blocking agents,” B. Wowk, E. Leidl, C. M. Rasch, N. Mesbah-Karimi, S. B. Harris, and G. M. Fahy, *Cryobiology* **40**, 228–236 (2000).

“Vitrification solutions of reduced toxicity,” G. M. Fahy, B. Wowk, C. Rasch, K. Kersh, and J. Phan, Abstract presented at 37th Annual Meeting of The Society for Cryobiology (2000).

“Molecular engineering: an approach to the development of general capabilities for molecular manipulation,” K. E. Drexler, *PNAS (USA)* **78**, 5275–5278 (1981).

Nanosystems: Molecular Machinery, Manufacturing, and Computation, K. E. Drexler, John Wiley & Sons, 1992.

“The technical feasibility of cryonics,” R. C. Merkle, *Med Hypotheses.* **39**, 6–16 (1992).

Nanomedicine, Volume 1: Basic Capabilities, R. A. Freitas, Landes Bioscience, 1999.

Figure 1

A schematic representation of tissue that is (a) frozen with a low concentration of cryoprotectant, (b) frozen with a high concentration of cryoprotectant, and (c) vitrified. The vitrified tissue is indistinguishable from the unfrozen state, except that all translational molecular motion is stopped.

Figure 2

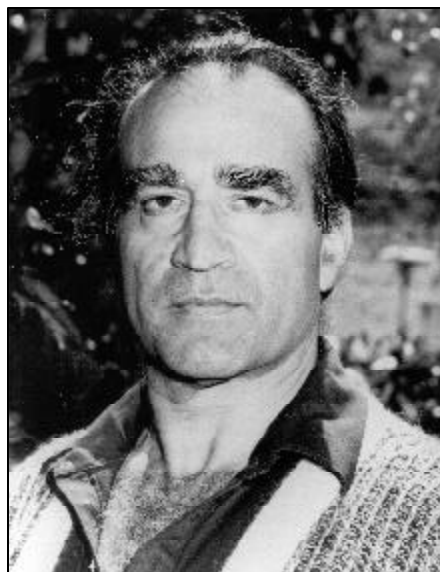
Transmission electron micrographs of brain tissue cooled to -80°C and rewarmed. Micrograph (a) is a canine brain treated with 7.5 Molar glycerol cryoprotectant, the highest concentration of glycerol that can be perfused into a cryonics patient. Large voids are present where frozen/thawed ice crystals have disrupted cell structure. Micrograph (b) is a rabbit brain treated with a vitrification solution. This brain has completely escaped damage from ice crystals.

Figure 3

Frozen (left) and vitrified (right) rabbit kidneys cooled to -130°C. Both kidneys are embedded in a vitrification solution. Only the vitrified kidney, having itself turned into a glass, remains undamaged inside the surrounding glassy solution.

Special Section

A Tribute to FM-2030



FM-2030

Now Hurting into the Future

by Fred Chamberlain

FM-2030's Visions—Overpowering!

The visions of the future held by FM-2030 were strong. So strong and so positive, perhaps, that they might have almost been paralyzing to most of those who read what he wrote and heard what he said. For decades, those who followed him saw the future unfolding just as he told them it might. Yet almost none of them elected to make the arrangements for cryotransport that he so vigorously advocated.

In the fall of 1997, Linda Chamberlain and I had the privilege of visiting with FM and a number of his friends who had gathered to hear about a company just then forming, BioTransport, Inc. They were curious about cryotransport but skeptical about the price. Knowing full well that even a heart bypass operation would cost as much, they asked why the arrangements could not be offered more cheaply. They were looking for more in the way of guarantees that it would "work." In short, their perceptions were like those of most people who contemplate the alter-

natives of cryostasis and conventional interment.

FM was frustrated and incredulous. He looked about the room and threw up his hands. "You people!" he exclaimed. "In this very room, thirty years ago, you would come each month and hear Saul Kent tell you that you should be signed up! And you are *still* not signed up!" To FM, the course of action was obvious. To those around him, it might as well have been invisible.

FM-2030's Loyalties to His Followers—Unswerving!

The events described above may have frustrated FM, but they did not deter him. Each time he called us at Alcor, and he called many times, there was one question on his mind: how could he better bring the vision of prearrangements for cryostasis to those he knew?

He talked of starting new groups in the locations he lived, of building strong networks among those who shared his ideas. In particular, a summer gathering in New York devoted to the benefits of prearrangements for all those he knew was an obsession with FM-2030. He was determined to bring this vision of what made sense so

strongly to others that they would join with him in his journey toward the future.

But, as might happen with any of us, time ran out. Before the promotional programs FM envisioned could be carried out, before he could recruit his many friends and family to join him in making prearrangements, an illness overtook him. Although all of those caring for him hoped for a recovery, a sudden turn for the worse brought FM-2030 down. Standby arrangements had been discussed, but none had as yet been made. As too often happens, FM passed into clinical death with no Alcor members present. And the logistics of retrieving him from New York City were complicated.

FM-2030's Launch toward the Future

A full technical report on FM-2030's cryotransport will appear in a future issue of *Cryonics*. This is merely an overview. Yet, the essence of what happened will be the most important part for you who are reading this. FM-2030 appeared destined to receive only straight cooling without cryoprotection, due to unfavorable initial

conditions.

In the end, exactly the opposite was achieved. Even with delays in initial cooling, complete absence of initial medications, and 30 hours elapsed before surgery began at Alcor Central, FM-2030 received brain cryoprotection at the highest levels set as the goal. Even though the time-related damage to neural structure is as yet undefined, there was no compromise related to an inability to carry out replacement of water with glycerol, which limits the formation of ice crystals.

How did this happen? How could it be? In an earlier case this year, all our advice from the most technologically knowledgeable sources we could reach was that 30 hours of delay would make an attempt at cryoprotection "futile." Lack of medication and poor initial cooling were the same. Was the surgical approach for FM-2030 different? Were there any factors that could have given us a better chance? We are still shaking our heads with amazement. And why did we attempt this supposedly "futile" procedure?

The answers are that Alcor was on the verge of implementing a protocol for vitrifying human brains and had already planned to take a new surgical approach for this, going directly into all major vessels leading to the brain at the closest point possible and capturing the return flow with no back-pressure. Although the new perfusates for this procedure were not quite ready, and the rapid cooling techniques were still being developed, the new surgical technique could be implemented on short notice, and a "pioneer" for the first use of it was needed. FM-2030 was that pioneer.

The only possible disadvantage was a slight further delay in cool-down to liquid nitrogen temperatures, but the possible advantages

were at least some cryoprotection. Weighing all the variables, the decision was made to attempt cryoprotection for FM-2030. Both of Alcor's primary surgeons were called in. One of the key individuals associated with the vitrification research project flew in and supervised the perfusion. Results from research still in progress were used to guide the cryoprotection, leading us to use slightly higher temperatures for perfusion than we usually have used and introducing pauses for tissues to absorb cryoprotectant at key points, where formerly we would have continued to raise the levels. This was an exploratory, experimental procedure in every respect, through all the surgery and perfusion steps. The results far outdid anything we could have hoped for.

The surface of FM-2030's brain, as seen through a non-damaging "burhole" in the skull (performed by Jose Kanschepolsky, M.D., a retired neurosurgeon who has done this in hundreds of operations), gradually receded from the underside of the skull. The brain was shrinking by a small amount, as cryoprotectant removed water faster than it could replace it in the brain tissues. For a long time, this reduced volume condition persisted, and then the surface level of the brain rose again, as the cryoprotectant gradually did infuse and replace the water it had withdrawn. This process took approximately four hours, versus the two hours more usual in the past. However, the end result was that the brain returned to normal volume with no indication of excess swelling.

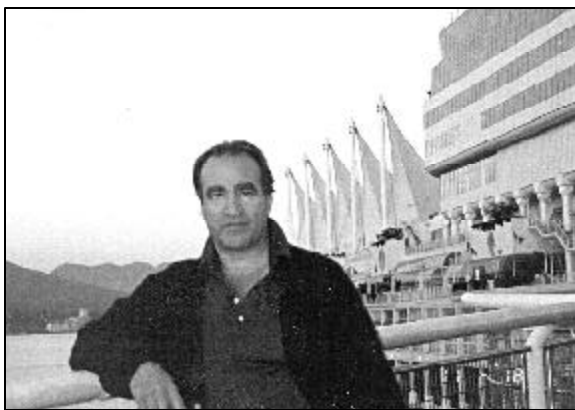
Fears that the capillaries would be "gone" because of the long delays proved to be unfounded. Coagulation was not a problem; a side effect of the terminal illness might have been a benefit, in that this ill-

ness reduced the patient's capacity for coagulation of the blood, but this is as yet speculation. Above all, FM-2030's cryotransport gave us the confidence to attempt cryoprotection in future cases where all of the vessels of the brain can be directly accessed (neuropreservation). We are still uncertain of the chances we might have in whole body cases, which do not permit direct surgical access to all of the vessels of the brain.

FM-2030's Future

The future is *there*! Unless the world destroys itself, or deteriorates in such a way that no attempts to recover our patients would be possible, this is our assumption. And FM-2030 (in a state of cryostasis) will be *there* also, if our attempts to build Alcor and make it strong succeed. Will FM-2030 be part of the future, as he always envisioned, in terms of "awakening?" How likely is it that he will open his eyes, free of pain and full of energy, and look out a window into a world that will fulfill all of his expectations?

While we cannot answer these questions, we can say that of Alcor's patients, FM-2030 is one of those most deserving a chance to "see the future" and be part of it. Of Alcor's present patients, he may appreciate the future most of all. Conspicuously, he was one of the most "forward-looking" individuals of our culture. Assuming that he makes it through intact, I cannot help but think that after a few months of familiarization, he will see entirely new possibilities of what is coming, which those of that time will still not have recognized. And he will be telling all of us about them!



J'Attendrai

by Dara Esfandary

Blast off!!! Blast off, he commanded!!! And so the zealous co-pilot would eagerly thrust the throttle ahead to full warp-speed! In 7 seconds the sonic boom would signify that we had just penetrated thru the sound-barrier. In 30 seconds we were soaring thru the stratosphere. Within 3 minutes we would behold the majesty of the rugged lunar hills. But on this mission, we would not have enough time for a lunar landing, for the caverns of Mars beckoned!

Each mission was different. Each mission would stretch our horizons and take us on a new interplanetary, even intergalactic, adventure. We'd lunch on Deimos, pick flowers for Mom in the telebotanical gardens of Jupiter, we'd waltz to Strauss atop the rings of Saturn, or rapel down the glaciers of Neptune. But before our final "descent" from the celestial, we would make time to also savor some of the pleasures of the terrestrial. Our earth-bound detour might be a stop at our favorite bistro in Paris to enjoy a scoop of ice cream while being serenaded by strolling musicians, who, when in FM's company, would ever so faithfully play Rossi's interpretation of

J'Attendrai. Or we might shuttle over to the Lodge above our favorite watering-hole deep in the Masai-Mara to quietly observe 10,000 elephants frolicking in glorious abandon.

It was always with a profound sense of awe that we would behold the infinity, and the beauty, of it all.

Now, to those observing us from the beach, we were probably two ordinary tourists bobbing about their over-visited waters in an ordinary place and time, and on a very ordinary vessel—a mere jet-ski. But to us, this was no ordinary vessel. The roar of its engine, ignited by boundless imagination and fueled by FM's explosive—and most contagious—enthusiasm, would launch us into the most extraordinary voyages of exotic discovery and unforgettable excitement.

I became a highly accomplished, well-travelled, co-pilot. And through it all FM never let me notice that I was only 10 years old, and not even qualified to operate this intergalactic spaceship!

And so this was the way of FM: making people feel good. Making people feel good—especially about themselves. FM's expressive and unselfish, unconditional, no-strings-attached kind of love for people—inspired many (including this 10-year-old boy) to try and grow each day—within ourselves. He inspired us to evolve. To cultivate hope where there was despair; to slap confidence in the face of overwhelming doubt; to subjugate pain with joy; and to banish from the heart any feelings of prejudice, misanthropy or xenophobia—such that we could open up room to germinate feelings of universality, philanthropy, harmony, and love.

And as we embrace these precious—and timeless—values, we observe that this voyage has NOT come to its end.

It's just another blasted detour! This time he's off to Arizona, where he awaits another "launch," the next blast-off.

Ladies and gentlemen, I invite you to listen carefully. Listen very carefully, and you just might hear that passionate voice of a gentle soul, whose life-long message of peace, hope, and love has finally achieved the dream of immortality.

1



Linking Up

by Nena O'Neill

When we first met, at our favorite Armenian soiree held in an artist's studio in the 1960s, we knew him as Feridouin, before he adopted his future name of FM-2030. *Identity Card* was behind him, presaging his interest in a global world. We were impressed and overwhelmed with his encompassing physical presence and his personal warmth.

He declared himself even then as a citizen of the world. And he dominated that studio then as he always dominated any room he entered. He was simply solid and dynamic—even charismatic.

I remember our Armenian safari one weekend when all of us bundled into two cars and took off for a Hampton's beach—a raucous bunch of daytrippers.... Setting ourselves up, we were playing ball, eating, talking—not unruly, just having fun. A fussy Hampton's matron walked over shaking her finger at us to remind us of the 12 posted rules about forbidden actions like tossing a ball and making noise. FM stood up, took her by the arm, and said, "Come, my dear," sweet-talking her back to her beach chair as he could so adroitly do, and we continued having fun.

We (my late husband George and I) became close friends with FM and fell under his spell. This was long before our splashy entry into the literary world. We met often, shared stories and philosophies, watched him run around Greenwich Park, chopped cucumbers and beets into his yogurt concoctions at his Village apartment parties. More often we talked while watching the stars from his Harbor deck.

He held those famous group discussions in the Village. Even my younger son, Brian, attended these lively, informative events covering everything from marriage to death and dying. As he developed his futurism we often argued about the demise of

marriage in his vision of the future.

For all his seriousness, FM had a wicked sense of humor, often delivered in his first-rate Indian accent. Whenever we met him—Westwood, New York, Three-Mile Harbor—each incident we shared became a treasured bead in the long necklace of our friendship.

One could have no better friend. He would pull you into his expansive wrestler's chest and hug you like the big teddy bear he was. His terms of endearment: "My dear," and "I kiss you," "I hug you, dear one," were lavished on one and all. He wrapped you up, cuddled you in a blanket of acceptance and love. He could very well have been a Linus blanket for many people. Most certainly a beacon for his students with his unlimited creativity in ideas about the future.

His capacity for affection was limitless and thus profoundly binding. I turned to him in grief when my husband died, and he was a great and substantial solace. When I started to write again after George's death, FM suggested agents and discussed my projects. His advice was sound and confidence-inspiring. That was probably one of his main attractions and why there were so many FM groupies through all the years. He emanated a generosity, a concern and solidity in all his dealings as well as his classes and groups.

Dear, dear FM, you were a synthesizer, gathering up pieces of information as you gathered together people, winding them all into your fabric of the future. I know you are there, your free soul wandering as you always did, exploring—your mind light-years ahead of others. I know you are linking up with the shooting stars you loved so much and linking together all your genderless souls of the future.

Wherever you are out there, I send a "kiss, kiss" and "I hug you, my dear FM." And I cherish the day we met and have yet to meet. 1

TRIBUTE TO FM-2030

by Flora Schnall

Dear Ones, as FM always said, today we pay tribute to an extraordinary man, FM-2030. In these brief words we will attempt to capture a little of his essence, to celebrate his life and anticipate his return through the triumph of science and technology.

FM was special—

His mellifluous voice with

his rolling r's,

His warm smile,

His kindness.

His sense of humor and playfulness,

His physique,

His prowess at sports,

His wisdom.

Many of the hundreds of cards and letters I received emphasized two of his qualities:

- 1) His visionary and original ideas, and
- 2) The profound impact FM had on the lives of so many.

FM spent many hours guiding and counseling his many friends and children... not biological children of course but children he parented, protected, and listened to.

He helped save marriages, he helped changes of careers, he helped with illnesses and addictions, he edited manuscripts of aspiring writers, he generously mentored many others. FM helped and made a difference in the lives of many friends around the world.

Just a tiny example of FM's impact: My nephew wrote me that when he was 6 or 7 years old after spending time with FM in East Hampton he returned home to Washington D.C. a confirmed vegetarian... at least for a while. But FM did, my nephew wrote, permanently influence the way my nephew treated people, animals, insects... all with a new compassion and respect and sensitivity.

FM was an original thinker—a visionary—a maverick. As someone recently wrote: FM “thought very large thoughts.” While we both might have looked at the same movie or read the same book. FM always saw something different... something new... something creative... something original.

He was a multi-track thinker.

FM had an inner radar capable of anticipating what lay ahead—

* When everyone was pessimistic and worried about global resources... FM was writing about optimism and abundance.

* When everyone was caught up in the cold war... FM was writing about the collapse of communism.

* As early as the 1970s FM was talking and writing about teleconferencing, telemedicine, telebanking... telespheres!!!

* When everyone wore ties and jackets... FM was already the forerunner of our current dress-down mode.

* When girls never called boys, FM and I met and I asked him how to spell his then first name—he took out his card, wrote something on the back, and gave it to me. I turned it over and there he had written his telephone number. He suggested that I call him sometime. I was quite taken aback. Of course, FM has a different version of the event!!!!

FM WAS A HUMANIST.

When he and his sisters were very young they witnessed the killing of a young pet lamb. As a result, FM and his three sisters became life-long vegetarians and advocates of vegetarianism for ethical reasons. As FM said he would never eat anything that had a mother.

FM was as attentive to a janitor as to a CEO. He was elegant and handsome and lived a beautiful life. But neither the pursuit of material things nor the pursuit of prestige were on his radar.



His link-ups and think tank get-togethers were special events devoted to discussing the many important issues that interested him: The transition to the post-industrial world, abundance, optimism, vegetarianism, immortality, and other future trends.

Up-Wingers, Inc., a nonprofit corporation founded by FM and a group of friends in the 1970s, was organized to pursue many of these ideas. You will find its manifesto on FM's website: www.FM2030.com.

Going through my mementos the other day, I came across a beautiful postcard FM had sent me. The card was a silhouette of two people strolling along a shimmering East Hampton ocean. He had quoted a Greek philosopher (Democritus):

“I WOULD RATHER FIND ONE CAUSE THAN BE EMPEROR OF PERSIA” “...We may not be emperors,” he wrote, “but we have found a cause... a dream.” FM wanted to influence the way people think about the world, about the future, and the way the world will be... or should be. FM wanted to get on to the next stage of human evolution.

FM HAD ONE SIMPLE AMBITION—HE WANTED TO CHANGE THE WORLD.

FM loved change!

He was not afraid of change. He

relished it. He felt it made one grow. He changed his name at least three times in the years I knew him. He moved around the world, living in Europe, in New York City, in East Hampton, in California, in Florida. He enjoyed making new friends, exchanging new ideas, giving away his possessions with each move and starting all over again.

* * * * *

I would like to share with you a note FM wrote me this past December:

Hi my sweetheart Flora—

Today—Saturday December 18, I woke up early in the morning (around seven am) and I toyed around with my computer for a while... my very first thought went to you:

How lovely that we are so deeply involved in each other's lives.

How lovely that you are in my life.

How touched I am by all your love and kindness of recent months.

Of course I will continue to be your guardian angel —for Life!

Love as always your FM.

* * * * *

Friends and family (and to FM you are all his family), FM will be the guardian angel for all of you... for life!!!

There never will be anyone who looked like FM.

There never will be anyone who thought like FM.

There never will be anyone who lived and loved life like FM.

There never will be another FM-2030.

1

An Eternal Hero

by Natasha Vita-More

"There will come a day when the death of any one person will be so rare the news of it will ring around the planet." FM-2030

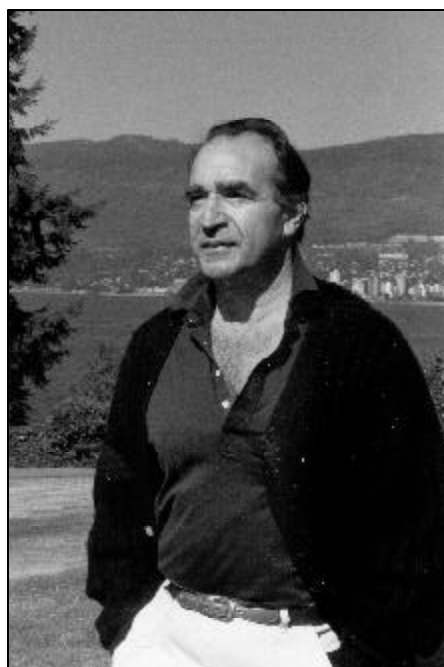
On June 8th the announcement of FM-2030's cryonic suspension sent an electronic flash around the planet headlining the world's most known immortalist.

* * * * *

FM's vision of the future is highlighted iridescently in bold strokes across the pages of his life. Words such as *multi-track*, *transhuman*, *global*, *optimism*, *telespheres*, and *linkup* have made their way onto printed pages around the globe and will irrevocably be associated with FM.

FM wrote and lectured about ways to navigate the future. He planned a strategy for examining the rapid changes ahead and scenarios for dealing with them. FM saw the world as global—an inter-connecting, telespherical community, believing there are "no illegal aliens, just illegal borders." He also emphasized the fluidity of humanity and saw today's environment as hyperfluid where people flow in and out of different lifestyles. He saw the future of humans as an evolution from being exclusively biological to becoming post-biological—the transhuman.

A fervent glance at FM's nostalgia for the future signals a hope for the prolongation of life and motions a desire for new and



exotic environments. Like a mosaic of divergent styles, FM's sense of life renders a deep appreciation of the universe around him.

A quick wit and cajoling humor balanced FM's pervasive privacy. He simply did not want everyone knowing everything about him. FM believed that he had transformed—that he was a continuation of his history and an amalgamation of his future. He encouraged others to embrace the future, and in doing so, he felt it was unnecessary to emphasize his past.

Respectively, he simply did not want to place emphasis on his birth date while believing he was ageless, one nationality while believing he was global, a single liaison while loving many. A consequence of this clandestine approach to life may have left many with a condensed version of FM. Perhaps he wanted it this way, in charge of his own distinguished memory, even from afar.

Regardless, it took merely a few hours for the news machine to publicize concealed information

that had made FM-2030 so legendary. These sidebars to his life clearly helped to form his prevailing character, but had little relevance in his pursuit of immortality. Inasmuch, it may take more than a headline article to wake up the world to the magnitude of FM's heroic quest.

"I have no age. Am born and reborn every day. I intend to live forever. Barring an accident I probably will. I also want to help others live on indefinitely." FM-2030

FM's many years teaching and writing about the future are well known among cryonicists and others involved in the business of future technology, science, and the arts. He was highly supportive of his peers and encouraged others to pursue their work in bringing about an awareness of the possibilities that await us. He had little tolerance for those who dismissed vegetarian views, who voted on politicians, who used terms like *boyfriend* or *wife*, who were not signed up for cryonics, who resorted to pissing matches, who did not exercise their intelligence, and who were inflexible about change. Conversely, he was patient and inspiring to those who wanted to enhance their understanding of the future. He was considered by many to be a heroic mentor, especially by proponents of our post-biological future. Further, it is his philosophy, as expressed in his courses from the 1960s along with his trilogy *Optimism One*, *Telespheres*, and *Up-Wingers* and his undeniable compassion for humanity that formed his vision and that was later expressed in *Are You a Transhuman?*

FM enchanted an audience by his charismatic manner; neverthe

less his greatest quality was enriching the mind. He seemed to be at his peak when taking a conversational lead, inviting others on his fast-track imaginative lift-off into the future. I remember his enormous capacity for understanding the deep anguish and great joys of humanity. I also remember our heady conversations, lively speculations, and long walks by the sea imagining a time when we would not be restricted by consequences of disease and aging, political and religious wars, the suffering and torture of people, and our own mortality.



As FM often said, “I am not an automaton—I am still locked in this biological body with some of the wiring of an early human.” FM wanted, more than anything, to shed what he called an “outdated body.” He wanted to live indefinitely. How strange it was to read the headlines on June 11th and the words *dead* and *FM* side by side—like a paradox.

As far as most people were told, FM did not know that his illness had become terminal. As far as most people were told, he was not aware that a suspension team had been alerted. As far as most people

were aware, FM did not knowingly prepare, in ways that most of us would want to, for his suspension. As such, he did not have an opportunity to discuss, in intimacy or in detail, issues with his close cryonics friends—issues that are necessary and even beneficial to his future re-entry. The reluctance of some close to him to engage in productive discourse about his situation was disconcerting. On the other hand, those close to FM gave him love, nurturing, and every ounce of possible hope during the weeks prior to his suspension.

What he really wanted had he known he was going to be suspended remains an enigma. There is no question that hope is exceedingly beneficial to a person ill and awaiting a cure. Those in suspension are still waiting. The hope to see our suspended friends again lies on the foundation of action to provide the best possible entry into and re-entry from biostasis.

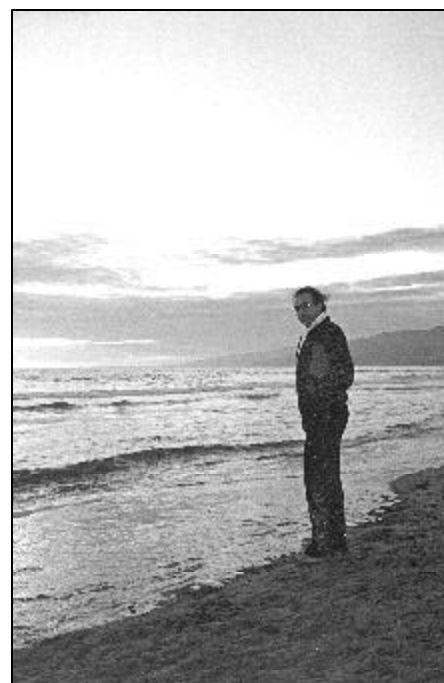
FM was my partner for many years and one of my dearest friends for many more. Rather than expressing or revealing the moments in our lives that brought us joy and fulfillment, I believe that he would probably want me to express it by simply appreciating a future of hope and momentous possibilities.

The photographs that accompany these articles on FM are from my private collection of pictures I had taken with FM at some of our many parties and on vacations. I hope that they give you a feeling for FM and his gracious depth and presence.

As the years passed, FM and I continued our friendship and we became colleagues. When I married Max, FM congratulated us with an enormous bottle of champagne and expressed his love for both of us. We three—FM, Max, and myself,

shared a common passion and vision about transhumanity. There was such a vibrant, healthy, intelligent and supportive camaraderie between us that I shall miss terribly.

There are many qualities that I admired in FM, but most of all, I think, it is his love of humanity and transhumanity that shall forever cause me to stop for a moment and appreciate the universe around me and feel charmed that I had spent much of it with him.



“Hope is the memory of the future.” FM-2030

* * * * *

On February 14, 2000, FM wrote the following and had it sent to me as an inclusion in my book about our culture.

I asked, “FM, what lies ahead?”
“These days I am at work on 2 sets of ideas.

“First, in the 1960s and 70s I attempted to develop and launch an overview of the social, educational, economic, and political infrastructures of the postindustrial world. I presented these agendas and models in books, in *New York Times* articles, and at seminars at the New School University and at UCLA. It turned out these efforts were premature. There was not yet a framework in which to file these new concepts.

“Today at the beginning of the 21st century these ideas are beginning to crystallize. If the nuclear family is in fact coming apart, what specifically is replacing it? What is replacing school-based education? What is replacing hospital-based medicine? What will eventually replace capitalism and socialism? What will take the place of elective government? Today more than ever people want hard answers to these pressing questions. I am offering a specific agenda for the postindustrial world that is this very day unfolding everywhere.

“Second, I am also at work developing a new set of ideas for the coming decades. Specifically who are transhumans? How do they differ from humans? When will we emerge as posthumans? Specifically how will posthumans be more advanced than humans?

“I expect to develop detailed profiles of transhumans and posthumans.” FM-2030

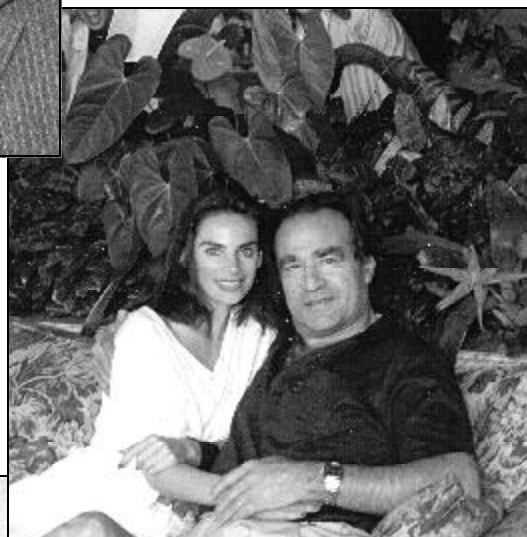
(FM-2030, p. 97, *Create/Recreate: The 3rd Millennial Culture*.)

* * * * *

You can find FM on the Internet at:
<http://www.transhuman.org>
 or
<http://www.FM-2030.com>



FM-2030 as a young man
in his 20s



FM-2030 and Natasha



FM-2030 and Ira Sarnoff



FM-2030 in 1995

Asilomar Conference (part 2)

by Fred Chamberlain
President/CEO, Alcor



Saturday evening's talk by Natasha Vita-More, "A Talent for Living: Cracking the Myths of Mortality" was followed by a panel discussion moderated by Natasha and featuring Max More, Ralph Merkle, and Gregory Fahy

"To be or not to be!" Natasha quoted from Hamlet, Act III, Scene I. "That is the question. Whether 'tis nobler in the mind to suffer the slings and arrows of outrageous fortune, or to take arms against a sea of troubles and by opposing, end them."

Then she continued (transforming Shakespeare's original words), "To die or to be suspended, and by ending death to say, 'We end the heartaches and the thousand natural shocks that flesh is heir to.' 'Tis nobler to defy the claims of death on our mortal minds, and to take arms against its eternal hold, and by opposing death, end it."

Natasha proceeded to explore the common mentality of Shakespeare's widely repeated phrase, "To be or not to be," pointing out that it has to do with life or death:

"To be—to live—is what we do. It is our talent, our business, and our pursuit of well being which we must carry out. The refinement of this

built-in talent currently separates us from other life forms. It is our native, intrinsic talent, calling for the creative challenge to do something—anything—as long as we are "doing." To be, we must do. If not, we are busy dying."



Natasha Vita-More

"The modern question: 'What do you do' has become the ancillary, although most socially repeated question in the English language. What do we do for a living has become the sine qua non for our lives. So much so, that what we do for a living characterizes our life's role. Yet, take the letter 'a' out of the question," Natasha said, and the meaning broadens (from "livelihood") to every aspect of what we do and seek to become. Essentially, she asked, "What are we *doing* about life?" And then she began to explore how our communication pathways steadily become

more intertwined with technology and how we are growing "out of" what we are at present and into what we may become.

The rapidly changing animated graphics Natasha used were interwoven with poetic narrative. The message (to me) was "There's so much more to life than we know, or can plan, or can even imagine, that to write it off as not worth pursuing endlessly makes no sense!"

That's not what Natasha said, of course, but that's where the flow of phrases and images took me. You'll have to be the judge, by buying a copy of the videotape when Alcor releases it for sale, along with other tapes of the conference.

For Natasha it is a matter of changing technologies and challenging cultural myths.

"Most of my communications are alphabetical letters arranged into words written in strings of algorithmic codes.... When I think of our culture, I see it as a body of electronically connected data filtering messages into its appendages. Out into the capillaries of culture, our technology has become far more exacting and more robust than our biological bodies. Our biological bodies are far too inadequate

to keep up with our ideas and the new landscapes we venture.

“Mobility has catapulted our evolutionary desires by affording us opportunities for exploration. Mobility has catapulted our ability to arrange words in ways that intensify meaning providing emotional leverage. The human body is more than appendage; it is a network of words and ideas pulsating across time. Our words about living and doing are emanating throughout the digital landscape—from Hamlet to AI and A-Life—with distinctive cultural jargon and digital acronyms, riffing on techno jive.”

On a more practical level, Natasha discussed an integrated work in which she is bringing together inputs from twenty minds who are creating the future. The purpose, as I grasped it, was to determine why people from diverse backgrounds would want to live longer and what myths hold people back from actively pursuing superlongevity. As opposed to in the past, when people who created the future seldom even saw it, much less became part of it, Natasha projected a world where no such incongruities would exist.

“The anthology is designed to communicate certain specific qualities which cause us to want to break through the myths of glorifying and tolerating death. Committed to the project are Ray Kurzweil, Roy Walford, Max More, Stewart Brand, and *Megatrends*’ John Naisbitt. I

am currently pitching to Barbara Walters, Arnold Schwarzenegger, Susan Sontag, and others. My strategy was to secure scientific and technological contributors and then to pull in cultural communicators. In many instances, contributors provide more than one area of knowledge, and this is actually what I am aiming for.

“If a ‘talent for living’ is a youthful and positive attitude, then a talent for living may indeed be the baton of wisdom passed on over the eons. Such a proliferate and infectious quality is easy to detect in others and to implement in oneself. It is inexpensive, unbinding, takes up little storage space, and by its own virtue—self-replicates. It also takes focus and elasticity. I find as I grow deeper, I have less and less tolerance for nonsense and more and more time for common sense. I have even greater stamina for sense-ability—the ability to use our senses for creating the future that our talents envision.”

Natasha’s panel featured three participants whose contributions to the future covered three major areas: cryobiology, nanotechnology, and philosophy. Greg Fahy, Ralph Merkle, and Max More were these three.

Natasha set the mood for the panel in her talk:

“Cracking the World War II Enigma code took a team of diverse thinkers. To crack the memetic code causing people to accept death, we need

diverse thinkers envisioning varying and unique scenarios. Contributions to this anthology will not go quietly into old age. We are Post-War Generation, Baby Boomers, Gen-X and Mirror-Boomers with a panache for improvement and a penchant for discovery.

“Cultural slogans change and myths merge, but they never disappear. They, like us, mutate.... They function as a means—like an impulse which alerts us to pay attention, if only for a moment ... (like) impulses firing off from one mind to another in archetypal discovery of another person’s point of view.”

The panel discussion began with an introduction by Natasha quoting comments she had asked each panelist to contribute about the others. “I asked each panelist to write a one-line statement about each other, and we enjoyed a sense of abandon in jesting our highly erudite praises!”



Ralph Merkle

“A brilliant pioneer both in cryptography and molecular nanotechnology...” (More)

“A magical genius whose ability to not only recognize what’s important but to also DO something about it...” (Fahy)

“A state-of-the-art scientist...” (Vita-More)

Ralph Merkle's Favorite Myth: "Cryonics Is Radical!"

Ralph Merkle spoke first, describing his favorite myth that "Cryonics is radical!" People say that "It is a wild thing," Ralph continued. They say, "It is new, it is different, it is *risky*!"

Ralph pointed out that this is something that is often said of cryonics, that it is *new* and *different*. They say, "We have to do something which is conservative, we need a conservative treatment like cremation or burial, things where we know the result. You see, we don't want uncertainty! The objective is to eliminate uncertainty, to be conservative, and know what the result will be; we must have these, but we aren't absolutely certain of the result with cryonics! So, cryonics must be radical."

"I've always regarded this as an incredibly odd idea, that cryonics is radical!" Ralph observed. "Because cryonics does the best we know, the best we're capable of, in preserving the structure of a human being. So cryonics is conservative in the best sense of that term. Cryonics is the most conservative treatment we have available. It is a treatment, it is a procedure, it is a course of action, which is the soundest, the best informed, the most consistent with the Hippocratic Oath, 'Do no harm!' And if we have a choice between a procedure where we are debating the outcome, and a procedure where we know the outcome, and we know that outcome is bad, then "Do no harm" says we should pursue the procedure where the outcome is actually uncertain, where there is not absolute certainty about what will happen, but where the possibilities are excellent."



Greg Fahy

*"A superb experimental scientist, possesses a deep knowledge of life extension research..."
(More)*

"The best and most talented cryobiologist on the face of the planet..." (Merkle)

"A mentor who has a creative knack for truth mining." (Vita-More)

Greg Fahy's Bane The Myth: "Free Radicals Cause Aging!"

Greg Fahy's idea of the most untenable "myth" concerning life extension is the free-radical theory of aging. "It's time to relegate the free radical theory of aging to the dust bin," he claimed. Greg pursued the idea that simply because something does damage does not at all establish that it is the fundamental cause, or even a major cause, of aging.

His first argument was that there is no place in the body any more hazardous from a free radical standpoint than the interiors of mitochondria, yet evidence that mitochondrial damage is extensive enough to cause aging is lacking. In fact, mitochondria seem to acquire damage after people are already old, not before. Mitochondria thus are a living demonstration counter to the idea that free radicals are fundamental to aging.

Greg showed several other slides that contradicted the free-radical theory of aging. His discus-

sion was technical, but the bottom lines were convincing. For example, the normal catastrophic falloff in vitality with age (in rats) is immediately preceded by a huge falloff in the amount of coenzyme Q10 in the heart. Such an abrupt drop in this coenzyme, when heart weight in general is stable or increasing seems impossible to ascribe to free radical damage, which ought to accumulate gradually and which seems to affect a small fraction of mitochondrial mass, Greg observed. As another example, he showed that a "protein synthesis pacemaker" gene in fruit flies could be relocated to a new location in the genome, where it was not subject to normal age-related negative regulation, and that this maneuver caused the lifespan in the treated population to be radically extended. Moving the gene would not be expected to shelter it from free radicals, showing that the shutdown in protein synthesis with age "is not connected with free-radical effects," Greg said, even though it is clearly related to age-related survival. Furthermore, both L-DOPA and growth hormone can restore protein synthesis in old rodents although neither is an antioxidant. Similarly, it seems unlikely that this kind of pharmacological reversal of aging processes would be possible if age-related functional decrements were due to random damage to thousands of genes and gene products, most of which could not be changed by single agents. On the other hand, mutations ("damage") in pro-aging genes in worms extends the worms' maximum lifespans by as much as sevenfold, Greg finally told the attendees, and the pro-aging genes don't appear to be concerned with the control of free radicals.



Max More

"The philosopher for the new millennium..."
(Merkle)

"Arguably the most brilliant philosopher of all time, since he seems to be the only one who actually figured out not only what's worth philosophizing about, but also what the right positions are!" (Fahy)

"His intellection easily synthesizes the economics of ideas and scenarios." (Vita-More)

Max More's Chosen Illusion: "The Zardoz Myth!"

Max More described the movie starring Sean Connery by John Borman (1974) as being about "a future society of *immortals* (as they're called) who are very bored with life, very stagnant, and on the outside are what they call the *brutals*, who are mortal and roam around what seems to be the Highlands of Scotland. Sean Connery is one of these brutals and eventually disrupts this immortalist society, and they all wind up begging to be killed, they're so bored with living."

Max pointed to a similar number of other examples of such myths throughout literature, about immortal people who grow bored with living. The common element seemed to be "changelessness" or the dead-end nature of existence, the only alternative being to change so much that "it isn't you" any more. In either case, the idea is that long life is no good.

Transformation of identity, how

fast you change, how much you change, and all of the associated dynamics, is the issue, Max pointed out, and mentioned that a great deal of his thinking on this appears as part of his doctoral dissertation on his website. One key idea Max emphasized was the difference between gradual change and sudden, disruptive change. "If you make too many changes, too drastically, you may lose your sense of self," Max said. "What I think is needed is clarity about values. We need to understand who we are, and what matters to each of us as individuals in being the person we are, what are our core values that make you who you are."

Summarizing, Max said, "I think it's, to me, almost criminal to propagate this idea that there's no way out of this dilemma: Either we die of boredom or we die of change. I think we can change, and we can change very drastically, but we'll still integrate that, we'll integrate every change as we go along, and we will become those future selves. We'll have chain of selves, if you like, one will grow into the other, just like we do now, but in a more drastic way. As long as we keep the core self there, and it's a gradual, integrated change, I don't think we'll disappear."

* * * * *

Interchange Among Panelists:

Greg Fahy added that the future kept opening up potential activities so rapidly that getting bored would be difficult. Natasha mentioned FM-2030's "multi-tracking" sense of how life is lived. Ralph Merkle recalled the Calvin & Hobbes response, that "There's seafood, I guess we'll always have that!" He

then pointed to the ever-expanding arena of discussion groups.

These were humorous comments, but it was apparent that the panelists had difficulty relating to the difficulties of long life. Natasha mentioned the play, "No Exit" (Jean Paul Sartre) in which a character is trapped in a windowless,



doorless room. Ralph recounted a discussion with another individual who believed long life was unworkable, but didn't want certain politicians to find out about it, because he "didn't want to take any chances." There was a sense that the panelists pictured those with no sense of long life but were baffled as to how such attitudes could be entertained.

Ralph Merkle said he found curious that people would express awe about the idea of vastly extended life but apparently feel no personal drive for it. Also, he said, there were interesting arguments that reconciled religion with cryonics, even to the point of integrating the idea of information-theoretic ideas of personality with the concept of the "soul." He further pointed out that there were arguments that extending life could be viewed as "man's purpose on Earth."

Max More commented that in teaching a course in comparative religion, he was interested to note that the concept "soul" seemed absent in the Christian bibles. Greg Fahy mentioned that he had found



some religious persons who felt that even extending lifespan was incompatible with their beliefs. Max's response was that the bible asserted that some biblical figures lived for extremely long periods, so in principle there were no conflicts with anti-aging research. From the audience, Steve Bridge reminded the audience that from some viewpoints of religious history, the idea of the "soul" is a relatively new idea.

The discussion of religion continued for some time, touching on Greek and Italian mythology, as well as referring to oriental religions. Some of those from the audience asserted a conceptual incompatibility of life extension (particularly cryonics) and religion, but Ralph Merkle countered that most religions accept and endorse the saving of lives by medical means, and thus (treating cryonics as an as-yet unrecognized medical procedure) no fundamental conflict exists.

Ralph Merkle continued the theme that cryonics could be presented as scientifically compatible with religion, and Max More pointed out that very few people, even if religious, were inclined to search for conflicts in their literature between life extension and religion, and then make an issue of it. Yet the topic of religion continued to "hold the floor." It was as if

the attendees sensed that some kind of vast shift of mentality was going to eventually take place, but that religious attitudes would be part of it. Not the abandonment of religion, but an adjustment, possibly as might have taken place with the recognition that the world was not flat but a sphere.

The issue of people having to abandon parts of their worldview kept coming up. Ralph Merkle recalled the early ideas on space-flight, where the *New York Times* in the early 1920's discounted Robert Goddard on the basis that, in space, the rockets would have "nothing to push against." Similar arguments against space travel were maintained until the early 1950's.

Greg Fahy mentioned the recent *Time* magazine and *Scientific American*, in which nanotechnology was being "taken seriously" and the idea of human cryostasis was treated very differently than would have been the case earlier. Taking the point of view, as he had mentioned earlier, that "Life extension will be popular when people think it is popular," Greg observed that "we are becoming the establishment," and that if we judge by that standard, our prospects for acceptance are high.

As was traditional for such events, finally one of the panelists noted that we were near the limit of permissible occupancy for the large

hall in which the activity was taking place. One could sense that the attendees were about to break into small groups and continue talking about ideas late into the night, within the many small conversation areas at Asilomar or elsewhere in the Monterey area.

Natasha closed the panel, with thanks to all, and the evening ended on a high note of optimism. There was a feeling of buoyancy growing out of this event which continued for the rest of the Conference.

* * * * *

More to Come!

At this point, only the first day of the Asilomar Conference has been reported in the pages of *Cryonics*. There will be more to come in future issues. Also, the videotapes of the conference are being edited, and releases are being secured from the speakers and panelists. Soon, those of you who were unable to attend will be able to "be there" by videotape. Bill Seidel, whose video work for Alcor stretches back into the late 1980's, is editing the tapes, adding titles and credits. For those of you who might not be aware, the videos were recorded in mini-DV format, essentially "broadcast quality," so the quality will be generally excellent. In particular, we think you'll want to have the tape of Natasha's presentation and the panel, as described above.

The Fear of Death and Its Implications for Cryonicists

Robert Newport



The following is the text of a paper presented at the Fourth Alcor Conference on Life Extension Technologies, Asilomar, Calif., June 2000.

Immortality looms! We stand at the threshold of a new age for mankind. Antiquity, the Middle Ages, the Renaissance, the Industrial Age, the Information Age, and now, at last, the Age of Immortality. Or almost—not quite yet.

Nanomedicine is only a concept, and its parent; nanotechnology, is still in its infancy. Many, many more people will die before the monthly tune-up dose of biobots eliminates aging as well as incipient disease. Nanotechnological treatments for advanced illness and injury have not yet been described, even conceptually. The general public knows very little about this field, although the scientific and technological communities are awash in information.

Cryonics is another story. Everybody knows about freezing people, at least in Los Angeles. So why, at least, haven't the scientists and technologists lined up at our doorstep to sign up? And, most important, why do many that have signed up lose their interest and fall out of the program? In other words, why do people behave irrationally?

These are the questions that I am going to attempt to answer here. My hypothesis is: The process of drawing valid conclusions depends on a supply of accurate data. Emotion is an indispensable part of the necessary data set (as is aware-

ness of the body), while our thoughts about ourselves are not. That is, the Fear of Death provides polluted data, which interferes with our ability to be fully alive and prevents our making rational decisions about our own lives.

Irrational behavior is nothing new. Irrational thinking is nothing new either. We all do both. Those in the scientific disciplines work very hard at not thinking irrationally and subject their work to peer review in order to root out those irrationalities that slip by. And yet, we are capable of logic and strive to be logical. Star Trek's Mr. Spock is known to most of us and held in high esteem; in fact he has become a cultural hero. This is so because, for most of us, most of the time we do not think logically at all; e.g., we do not think according to clear-cut rules that result in a valid conclusion.

As for our behavior, well, we don't even pretend to behave rationally. We are driven by emotions and those are irrational, as everyone knows, right? Wrong. Both are wrong. We do behave rationally (most of the time), and our emotions have their own logic. (I am stretching the definitions here a bit, using rational to mean proceeding to accomplish established goals in a manner, which is successful, and logic to mean order).

So why doesn't it look like it, why doesn't it feel like it, and why, especially in a matter so fundamental as preserving and extending life, don't we act like it?

I think that, again stretching the definitions, all of us are in the ultimate sense, very rational. We survive; we live; we provide for our food, clothing, and shelter; we interact with other people; and we perpetuate our species. (Those of you who do AI, have some idea of what it takes to manage the machinery as complicated as the human body and brain). So, how does this work? As a living organism our first priority is to live. We are endowed with multiple redundancies, and homeostasis is the healing principle that applies to all life forms. So, again how does an action, like not signing up for cryonics, or maybe a simpler example, being too tired to exercise, which I think is analogous, fit into this rational schema of survival?

So far I have been talking about people as if they were or had a unitary or whole self. When you meet someone, you might say, "I am so and so, who are you?" and they will respond, "I am so and so, nice to meet you." Now, So and So 1 is acquainted with So and So 2, and what just exactly do they know about each other? Other than their names, So and So 1 and 2, not

much that they can articulate.

Each will have a felt sense about the other that with some effort they might be able to express in words, but on the basis of just that exchange they will know very little. It will take many many many more exchanges before anybody would be comfortable saying "Oh, I know So and So!" and even then, So and So will continue to surprise us. And, heaven forbid we should become So and So's lover and move in with him or her, then the surprises will start in earnest. "Who is this person that I am with?" She/He is certainly not the attentive, sensitive, etc., person I fell in love with!" We've all had this experience. In fact, if we are at all self aware, at times, we don't even recognize ourselves.

What's at issue here is the definition of self. Most of us, most of the time believe that we know what we mean when we say, "I," "Myself," "Me." That is to say most of us believe that we know who we are. In *Society of Mind*, Professor Minski tells us there is in fact good reason to believe that our minds are incapable of knowing who we are. We know that consciousness of self is an "after the fact" phenomenon. Action first, thought later. My mother always said, "think before you act" while punishing me for some transgression or another. Well, that's not possible mom, pardon me!

Problems are solved, challenges are met, and the brain executes behaviors before we think about it. Most of what goes on in the brain and in fact in the entire body goes on unconsciously, outside of our awareness.

Question: Who do we think we are? Answer: Whatever we happen to be thinking we are at the moment. We know, in our conscious minds, very, very little of ourselves. We know more of what we think about ourselves but even not all of

that. Freud described our mental lives in terms of three domains: the conscious, the subconscious, and the unconscious. He also described architecture pertaining to each domain: ego, superego, and id. The id pertained only to the unconscious domain and contained drives and impulses, which were in his view not admissible to consciousness. The superego was conscious and provided ongoing criticism of our behavior, thoughts and feelings (sometimes way too harshly) and when not busy lives in the subconscious ready to jump.

The Ego pertained to all three domains and consisted of many different functions grouped into three categories: the defense mechanisms, the autonomous functions, and the synthetic ego. Everyone has heard about the defense mechanisms, or at least those that work at the conscious level (denial and suppression). The remainder of the defenses operate unconsciously, and so their impact on the conscious self is invisible as is their purpose.

Why do we need to be defended? What are we defended against? What could be so bad about knowing or remembering our drives and impulses? As we will come to see, it's not so much the nature of the drives and impulses but the memories attached to them that carry the danger. However, what concerns us here are the synthetic ego functions. That is, the ability and the tendency of the mind to synthesize a continuous, coherent, consistent, sense of self, though this isn't really a sense; it is a self description or story. It is a sense only in the sense that when we're not actively thinking about ourselves, which is rare, and we are subliminally aware of the story in the subconscious mind, ready to appear again, and there is a large, the largest, part of the story in the unconscious mind.

I said that we believe we are what we happen to be thinking we are in the moment. So, who am I when I am asleep and not thinking? If I am dreaming, I am me dreaming. (Even if I happen to be someone else in the dream, I am still me.) So this suggests that the "me" is the content of my awareness. When I am asleep and not conscious, then, there is no me, or no self story that is.

When I awaken and become conscious, the synthetic ego goes to work, and there I am again, stretching and saying, "I had a great night's sleep" though, if I slept through without dreaming, or having to get up to pee, I had no sense of myself whatsoever. My body, my brain, myself AS A HUMAN BEING, did exist in that bed, throughout the night, rationally managing the myriad operations of the body, tossing, turning, breathing, beating my heart, etc., etc.

How do I know it? My synthetic ego puts it together as the story of myself. My unconscious autonomous ego worked all night experiencing the bed, the temperature in the room, the weight of the covers, all of my movements, etc., providing a lot of data to the unconscious synthetic ego, so that in the morning I would awaken with the me with whom I am so familiar, a little older and perhaps a little creakier (Descartes put it as "I think therefore I am").

Okay, so I think that I am Doctor Robert, I am a retired physician, I am a Vice President of BioTransport, I am a father to two beautiful daughters, a grandfather to two delightful little boys whom I enjoy and feel wonderful about. I am standing in front of a group of distinguished scientists reading this paper. I am wondering if they'll laugh at me. I'm so nervous, I feel... afraid of being laughed at. I feel...

...What's happened here? Some

feelings have crept into my self-definition. Some of the content of my consciousness now includes feelings. I have emotions! Wow! Now I can define myself as afraid. Oh joy! So part of my self-definition includes my perceivable emotions. And does not include those emotions, or parts of emotions, or all of the unconscious processes that must go on to produce the emotions, which are not being perceived in the moment.

And "Aye, there's the rub." "There's the fly in our ointment!" "Myself" now includes, as a crucial part of my self definition, emotions but does not include any of the mechanisms for generating those emotions. And this wouldn't be a problem if, and only if, our emotions were always entirely rational. Which they are not, AND they should be.

We have all had those rather rare experiences of being really in sync with what we were doing. "On a roll!" "Flowing," a sense of power and exhilaration, being really in tune with another person or a group. Dealing successfully with an exceptionally challenging situation. Sometimes during sex. Usually these experiences occur simultaneously with action, not thought (though at times, thought can be a part of the action).

It seems to me that this is the way emotions were designed to work. All animals have emotions; in fact, anything that moves has emotion (and that may even include plant life though in some way beyond our ken). The word emotion is derived from the word motion (movement) and 'e' signifies away from, or movement away from, or behavior. Our minds, specifically our synthetic egos, conscious of our behavior, slightly after the fact of it, read this behavior, this movement, as emotion.

And then we interpret it according to the dictates of the synthetic

ego, and it, our own emotional behavior, becomes part of our self definition, part of a story that give us continuity and protects us from the remembered pain of the memories that the synthetic ego is using to write the story with. This is a lot of cognition. And it occupies a lot of our awareness. Takes a lot of attention. Attention that would perhaps be better focused on what's going on in front of our faces, rather than tied up with our own self story. And what's worse, this story is frequently wrong, a fiction, because we were not at all conscious of what really generated the emotion. We are conscious, usually, of what the external stimulus was, but not at all with how the mind came up with the interpretation, because that part of the emotional processing was unconscious.

Okay so what am I saying? The conscious mind, the conscious self, the sense of oneself, I, I am defining myself on the basis of what I am perceiving in the external world and on what I am perceiving of my reactions to that external world, and what is in my memories conscious and unconscious, and this process is taking place somewhat after my reactions and takes a great deal of my attention and awareness (I said at the beginning that the process of drawing valid conclusions depended upon access to reliable data). And I live therefore a pretty unaware, disconnected, randomly, haphazardly happy life, frequently fighting off an inner sense of shame and dread, when it's really not necessary, because the emotions, when uninterpreted by the mind and when the Human Being that we are, is paying attention to the external reality, the emotions, our emotions, turn out to be completely rational, e.g. they help us accomplish our goals in the moment.

Which is to say that if we are paying complete attention to the problem in front of us, to the

situation in which we are involved, to the reality in front of our noses, and not cogitating, even unconsciously, which means filtering our perceptions through the defense mechanisms and synthesizing them into our self story, we will behave appropriately. And it is not often that fear, rage, or shame in any degree are appropriate, that is, needed to solve the immediate problem.

Joy is the baseline emotion for a human being, unencumbered by the weight of his own self definition. A human being who is his or her body/brain, who is not full of self-defining thoughts, conscious or unconscious, who is not busy explaining to him or herself what those feelings mean, who is mostly silent (except, when thinking and speaking are necessary to accomplish a goal), who's awareness includes his or her own body movements, sensations, emotions, not just what they think about the emotions.

That person I call the Fully Rational Adult. And there aren't that many around. I have met a few people in my life who I believed to be ALMOST Fully Rational, but not often. Interestingly enough, people who come for psychiatric/psychological help are among the more rational. They have at least become aware enough to know that something is wrong.

The vast majority of all of us, 95% by some estimates, are almost completely irrational when it comes to ourselves and live within the confines of the synthetic ego, limited by our own self definitions, our own self story, attentive to mostly the sound of our own thoughts and thereby disconnected from the incredible machine that is the body and from the fabulous computer that is our own brain. Unhappy, full of existential angst, low grade misery, anxiety, depression, missing out on the full joyous

experience of being alive, unaware of the origin of our misery, but most likely willing to talk about it and explain it all day long. Why?

Stanislav Grof, a Czechoslovakian psychoanalyst working abroad in the 1960's, induced altered states of consciousness in a large number of psychiatric patients and found that the patients had access to memories and symbolic experiences that had heretofore been entirely unconscious, many dating to the first few weeks of neonatal life and including long forgotten (or repressed) physical traumas. Very many included intrauterine experiences of a close encounter with death.

These experiences Dr. Grof constillated, called Basic Perinatal Matrices (BPM), and classified into four stages. BPM I through IV corresponded to the four main categories of experiences of every human being's early life. BPM I: Intrauterine peace, support, and nurturance. BPM II: The beginning of the birth process when the earlier peace is rudely disturbed by uncomfortable contractions about the head along with a change in the chemical composition of maternally supplied blood due to the rapid hormonal shifts that bring about the labor and emotional changes in the mother (who is understandably aroused). BPM III: The progressive agony of being squeezed into the birthing canal. Squeezed to the point of death, squeezed, slowly crushed, to the very point of death. (Sounds like some medieval torture.) And BPM IV: The shot of adrenaline and the release from the vagina into a very novel and harsh light of day.

In all cases, the experiences were remembered as traumatic and the arousal was experienced as terrifying. Known to all, now, simply, as the Birth Trauma. In most cases this constitutes the first conscious content involving pain and adrenaline prompted arousal, which

in our later years we come to know as fear and rage. This is the first experience of the FEAR OF DEATH!

A template in the unconscious mind upon which many of life's more arousing experiences are fit. And these memories are not associated with verbal symbology, until one to two years later when we become verbal. By then, we are well accustomed to the experience of contraction and release, pleasure and pain. Joy and Terror. And the memories of same, though not verbal, and not available to ordinary consciousness, are well encoded onto our brain.

After birth, we are raised by parents, and then the fun starts. Or at least it should, and in most cases it does, along with the love and attention, and nurturance and protection that is required for us to grow and to learn what we need to know in order to survive on our own. And if we all got that all of the time, then I probably wouldn't be writing this piece, and there would have been no need for psychiatrists, and in fact not much need for any of the professions, for we would all be Fully Rational Adults and it would be a different world.

But it's not, so what happened? With extreme pain, shock and terror (chemically caused by adrenaline) as our first template, we are sensitized to further trauma. Charles Nemeroff of Harvard has exposed rat pups to painful stimulæ and has been able to demonstrate cellular changes in their brains after only 2 minutes of stress induced adrenaline release. We are primed.

Our parents, bless their hearts, did the best they could, most of them, and most of them were good enough (Don Winnicott, 1965) to raise us up more or less successfully. They were not perfect. There were times when we were alone, hungry, thirsty, cold, dirty, before we had any time sense, when being

alone was the same as being abandoned forever. We were terrified. We were helpless. Our only tool was to express emotion, that is cry or laugh or coo and grab a finger.

Laughing, cooing, grabbing a finger aren't effective when there is no one around to supply the finger, and crying, screaming, and thrashing about become rational behaviors. But they are costly behaviors for an infant, very energy intensive. Do you come home exhausted after screaming in excitement at the Lakers' games?—that's the kind of energy that is expended by that tiny infant. And if no one comes soon, there must be some mechanism to shut it down, or the infant will die of exhaustion. And so the brain does shut it down after a while.

It is also true that in our society many parents were uncomfortable with our adrenaline-prompted screams and shut them down for us, by subtle or not so subtle censure, and so gave rise to the experience of unexpressible adrenaline arousal. We call this Shame. You probably know how it feels; I haven't met any other than a few sociopaths who didn't. At its most intense we call it humiliation, and it is about the most painful of human emotions. You flush and your skin burns like fire. Your blood pressure surges, and your heart gets stuck in your throat and chokes your voice into a dry squeak. Your ears ring. Your mouth is full of dry dust as involuntary muscles controlling salivary gland outflow go into spasm. Your vision is directed at the floor as you submit, actually or symbolically, to the heavy hand of authority, and if you are in public, you are verging on panic and looking for somewhere to run.

And that's your adult body's experience, but within your unconscious mind, the unconscious self story, there are memories of a child's agony, of wanting to run, to hide, to die. But chances are most

of you have not had this experience too often. We live our lives to avoid it, both consciously and unconsciously. For the most part, successfully! And why not, it HURTS! But there is a cost, because the avoidance becomes part of our self story. Our self-defined self. And so we turn off unwanted feelings AUTOMATICALLY on instructions from the unconscious mind, that say, "this will kill you if not stopped."

Instructions dating from infancy and early childhood, when the intensity of the emotion could be deadly, not by stopping the emotions, but by relegating them to the unconscious and subconscious domains. Usually they live in the subconscious mind, and we are perhaps aware of a much attenuated version, and the chronic autonomic stimulation wreaks its havoc on the body.

The chronic illnesses, hypertension, gastritis, ileitis, colitis, autoimmune disorders of all kinds, anxiety disorders, depression (depression is diagnosable in 10 to 25% of the adult population at any one time), hormonal disorders, and cancer. Have I covered everybody in the country yet? Not quite; well let's add ten million alcoholics and substance abusers.

So, unconscious, deeply unconscious, repressed preverbal memories of the birth trauma and parental abuse or neglect, including fear, shock, trauma, rage (adrenaline prompted arousal) and instructions to shut down the expression of same occupy this domain where they are constantly reinforcing the neural pathways and perpetuating both the physical experience and an unconscious self story that defines one as helpless, worthless, hopeless, etc., etc., and with which the conscious self story is silently shaped.

And this is the problem: The human mind does not seem to be able to think about its unconscious

domains.

Introspection does not work. We become enchanted, so to speak, with our conscious experience, the sounds of our own thoughts, and we do not even know that anything is amiss with ourselves; it's always the other guy, it's out there, fate, just life, life sucks and then you die, and we don't understand that we are more than our self story, our thoughts, that we are in fact a human being, an incredibly marvelous body and unbelievably complex brain, living as an intimate, inseparable part of this planet's biosphere, where as of to date we as the collective have been able to do just about everything we can imagine doing, with the single exception of being able to relate to each other as Fully Rational Adults and take the next step to peace on earth and immortality for all who want it.

We confront death in the birth canal; we have no tools (other than adrenaline) with which to deal with it. We are helpless and dependent on necessarily less than perfect parents for our very survival, for the first eight to ten years of our existence. The vast majority of us live in cultures that promote the suppression or inhibition of emotional expression by children (be seen and not heard was my parents' injunction). And that support disciplining children in ways that not only reinforce the earliest trauma but also convert the emotions of fear and rage into shame.

And while we live in a world that demands verbal competency, we accept a poverty stricken emotional lexicon. We live in our minds, unconscious of our first brush with death and the pain, fear, and shock that attended it and forever stamped us. As a result, we are out of communication with our body/brains; we rarely fully experience our emotions (we don't even have an adequate language for them).

And what does this all mean for cryonicists? Well, there are about 6 billion of us living here, and if 95% are more or less lost in their own mental construct of self, unconscious of who they really are, out of tune with all but the most extreme of their emotions and therefore driven (motivated) by the unconscious need to shut down their emotional lives and avoid in any real way the issue of death (and I think that living in a fantasy of an afterlife or heaven is not a real way of dealing with the issue but only another way of shutting down ones' experience of oneself) then that leaves about 300 million people who have the possibility of being awake enough to entertain immortal life.

People are moved to cryonics one of two ways: By the LOVE of life or by the FEAR of death. I suspect, and I will shortly be conducting a study to either affirm or disabuse myself of this notion, that those who drop out once signed up were motivated by the fear of death (conscious or unconscious) and have finally gotten tired of living an unhappy fear driven life. Having had no hope in BPM III, they cannot maintain hope in their own future.

Many of you might say, "I came to cryonics because it's the only rational course of action; it has nothing to do with fear or love." To which I would respond, "Your thinking rational mind outlined the course, but it was your emotion that moved you. Joy has the potential to make it worth staying the course, Fear, conscious, subconscious or unconscious, does not. It will only kill you in the end."

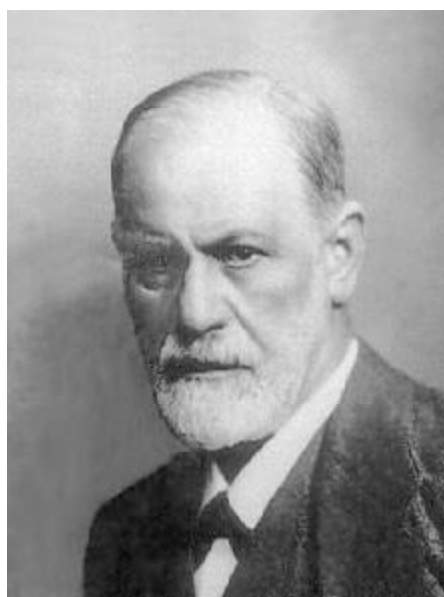
Thank you. I also wish to credit Sigmund Freud, Don Winnicott, Alber Ellis, Stanislav Grof, Marvin Minski, Charles Nemerof, and Jidhue Krishnamurti for the seminal ideas behind this paper.



THE MYSTERY OF THE NON-SIGNUPS AND THE WISH FOR TRANSCENDENCE: DID FREUD HAVE THE ANSWER?

by R. Michael Perry, Ph.D.

Sigmund Freud, the famous psychologist and founding father of psychoanalysis, died at the ripe age of 83 in 1939, two days after the start of World War II. He was neither an immortalist nor especially, in that distant time, a cryonicist, yet his psychological researches, amply documented in his papers and books, offer a possible insight into many mysteries of human thinking and behavior. Among these mysteries is why we in cryonics don't get more signups (or haven't as yet). Many theories have been advanced for this by the handful of us who are interested. Nobody has proved that cryonics will work, which is to say, lead to successful reanimation of frozen patients, and some see in this the one significant factor. But, without denying that their argument carries some weight, it doesn't seem to tell the whole story. Religions, for example, promise life after death, something that also has never been demonstrated, yet they attract followers by the millions. (By way of contrast, to date perhaps about 750 people worldwide have signed up for cryonic suspension, more than half of them with Alcor.) And I should note that cryonics, though unproven, has some significant, indirect arguments in its favor. These are scientific arguments, of course, that do not require any paranormal or mystical component of reality, unlike those advanced by the major religions.



The "death wish" is a well-known feature of Freud's theories, which led to the investigation reported here. We are concerned with whether people do in fact have some sort of self-destructive impulse or desire for oblivion that inhibits them from seeking an extended life through cryonics or other technological means. And, in particular, did Freud understand this and arrive at a correct formulation of a death wish that explains (or can be extended naturally to explain) the observed attitudes and responses?

Before going further, I can give a short answer: basically, no—the death wish or death instinct envisioned by Freud does not seem to actually exist as

an element of human psychology (normal psychology at any rate). It thus cannot explain the failure of people to consider the cryonics option. The resistance to cryonics may involve a "death wish" in another sense, and this itself is a worthy topic of investigation, but it is beyond Freud's thinking—it is briefly addressed below. But, delving into Freud's work has uncovered other interesting material that bears on the issue of human immortality or, more precisely, a transition from human to more-than-human. Freud, we shall see, was backward in these areas, but his very backwardness leads to interesting thoughts that can enlighten us.

First, we consider the Freudian death instinct. This is outlined in two short works: *Beyond the Pleasure Principle* (1920), and *The Ego and the Id* (1923). Previous to this, Freud had developed a "pleasure principle" to explain human behavior. Quite reasonably, the human organism seeks those activities that lead to states of pleasure or enjoyment and shuns what is painful or in some overriding way unrewarding. In particular, the pleasure principle is evident in erotic and sexual activity, to which Freud attached much importance. This, however, was then viewed as inadequate to explain all mental events and behaviors, such as, for example, sadistic or destructive behavior. Something more was needed. Freud imagined that along with such

“life instincts” as are conducive to survival and propagation of the species there is a “death instinct” that seeks to return the organism to the inanimate state from which life originated. (Here the organisms are not limited to humans but include other sentient creatures as well.) This death instinct, Freud thought, derived ultimately from basic physics: systems tend to get more disordered over time. This principle, which is really just the Second Law of Thermodynamics, was thought to be somehow reflected in the psychological makeup of creatures in the world governed by it and other natural laws. It appears, then, that creatures must evolve in such a way as to have wishes that faithfully endorse the laws of physics!

Needless to say, this opinion met with much skepticism. It was also not supported by experimental or clinical evidence, so that the “death wish” as Freud envisioned it is not taken very seriously today in the psychological establishment. This is not to say that organisms always obey the pleasure principle. But any departures can be seen as consequences of an overriding dictum: to survive and propagate the species. Aggressive behavior, for example, could be advantageous when confronting prey or resisting competitors for food or mates. Beyond such thoughts there is no need to assume that the wishes or instincts of the organism must recapitulate physics.

However, we are still faced with what seems to be a form of death wish. People haven’t turned out in force for cryonics, but instead, when confronted with the issue, often become death apologists. (“Death is just as natural a part of life as living,” one such person insisted in a discussion we had on cryonics.) So what are we to make of this?

Cryonicists have devoted much thought to the question, as we have noted. Some basic conclusions seem reasonably clear, even if much still is

not. In particular, the deathism we see does not seem cast in stone but might be abandoned if more evidence favoring our position could be obtained. Achieving reversible suspended animation would furnish good evidence of this sort and could arouse great personal interest in cryopreservation. A cure for the aging process could also work in our favor, for there might then be more interest in a backup strategy for prolonging life, and, more generally, the idea of extending human life would be taken more seriously. But, barring such breakthroughs, it looks as if death acceptance will be the preferred choice of most people for the foreseeable future. Still, this response, though presently so pervasive, lacks the force of a basic instinct or drive, inasmuch as it seems dependent on perceptions of externals: the inevitability of death and the impossibility of substantially forestalling it. Such perceptions, we may conjecture, tend to result in death itself being seen in a positive light. If the problem of death cannot be solved, the thinking is apt to run, then perhaps it is *good* that it cannot be solved—and so on. There is satisfaction in the belief that what one cannot change is somehow right and proper—the world becomes a friendlier, more comforting place. But it also seems likely that if death were not seen as inevitable, an apparent wish for it would lose force. This should happen with sufficiently strong evidence that life can be substantially extended. As yet, the suggestive evidence from cryobiology and other sources is not strong enough for most people. Their attitudes are shaped by long conditioning beginning in infancy, and they, in the bargain, are not likely to be experts in the scientific disciplines in which important progress has been or is now being made.

To return to Freud: his efforts to understand the human psyche were not merely academic but were directed toward healing illnesses, and more

generally, toward finding life meaningful and worthwhile, and transmitting his findings through various channels to the world at large. His task was not an easy one. An uncompromising materialist and atheist, he was not satisfied with appeals to religious dogma but instead chose the more difficult path of science and reason. Moreover, his object of study, the human mind, is most difficult and complex in its own right. That he did arrive at some important insights is generally agreed, and this alone is remarkable enough, but we should not be surprised that his treatment has its share of noted imperfections. But Freud is also interesting because of his basic orientation, which may have had some sinister consequences he never intended.

To wrest meaning out of a world in which death must be seen as inevitable, near to hand, and final was not easy, but this was the task that the scientifically minded Freud faced bravely. Also clear, however, is the fact that his premises and approaches, however correct by objective standards of the time, led to conclusions that very many people find depressing. Freud’s outlook was not very positive toward the grander aims of humanity and instead focused more on immediate gratifications, particularly sexual behavior. This is brought out rather forcefully in *Beyond the Pleasure Principle*:

“It may be difficult, too, for many of us to abandon the belief that there is an instinct towards perfection at work in human beings, which has brought them toward their present high level of intellectual achievement and ethical sublimation and which may be expected to watch over their development into supermen. I have no faith, however, in the existence of any such internal instinct and I cannot see how this benevolent illusion is to be preserved. The present development of human beings requires, as it seems to

me, no different explanation from that of animals.”

Freud has an interesting if pessimistic explanation of “[w]hat appears in a minority of human individuals as an untiring impulsion towards further perfection.” Civilization, in this case, represses the expression of basic instincts (one must assume here that Freud means the “life instincts,” and apparently then, primarily sexual feelings) so that another outlet is sought. But this second outlet, satisfaction through achievement or a creative process, can never do more than partly gratify the repressed desires, so it must be invoked repeatedly, which leads to perfectionism and an “untiring impulsion.”

One cannot help wondering how Freud’s own outlook would have differed had he lived in more recent times. Such prospects as reversing the aging process are now being taken seriously in scientific circles. Would he still have attributed creative and perfectionist impulses to repressed sexual feelings, or seen in them something more fundamental and stand-alone? This question must remain unanswered, but the underlying issue remains of whether there might in fact be a human drive or instinct for perfection or unending improvement, something that is not simply the reproductive instinct or some other impulse in disguise.

In fact, I think a good case can be made in favor of a drive toward self-improvement and a higher state, something basic to humans, and not merely confined to a minority. I don’t see it as simply a “will to power” or wish to exert control over others or one’s surroundings. Instead it is an urge to advance to a greater being all around. Its roots are deep and natural, for the growing child must master many skills and increase in size and strength to become an adult. A wish by the child to further this process would make much sense on grounds of natural

selection and this, I think, accounts for much of the eagerness to acquire new skills and knowledge that we find in the younger set. So childhood becomes dominated by a wish for transcendence, one that is realized, normally (if only approximately or roughly) in the passage to adulthood. In view of the importance of the growth process that is furthered by it, I doubt if the wish for transcendence has an easy explanation in terms of other drives, including the sex drive that rises to prominence later. Moreover, all adults start as children, so the wish for transcendence is not confined to a minority, even if only a relative few distinguish themselves later in life through their own creativity. These thoughts, then, I offer in opposition to Freud.

The wish for transcendence does not disappear as adulthood is reached, despite the rarity of creative geniuses, but quite reasonably stays with us, where it serves useful functions throughout life. Standards of conduct, values, and even religious beliefs appear to be influenced or largely generated by it. More generally, whole cultures and civilizations appear to be shaped by a sort of collective wish for transcendence that emerges from the wishes and impulses of many interacting individuals over time.

Freud sought to deny or minimize the wish for transcendence, and so have many others over the past century or two. More generally, a pessimistic stance has been advocated about the overall meaning and value (“if any”) of life: No heaven or afterlife is possible. People instead are simply one more type of machine to perpetuate genes, along with fishes, flies, and bacteria. This philosophical stance has arisen, not out of any malicious or subversive intent on the part of its advocates, but because it seemed the only realistic outlook based on a scientific worldview. But I think it has had sinister consequences too. If it is accepted that individuals are necessarily

fleeting, transient effects then the nation, the race, or the species may assume a prominence, in the minds of those wielding power, that is highly detrimental to many of those same individuals. The race-based atrocities of the Nazis and political exterminations of the Communists come to mind, along with more personalized acts of terrorism such as the serial killings of neo-Luddite Theodore Kaczynski.

Fortunately, our continuing progress in the biological sciences has finally begun to challenge the dreary, deathist viewpoint. We contemplate ending the ages-old scourge of mortality through understanding and control of aging and diseases. Meanwhile we arrange for cryopreservation in case the life-extending breakthroughs are too long in coming or something unexpected intervenes. In taking this stance we commit ourselves to a radical new view, and gladly. With the elimination of death, life in effect will become an eternal childhood. The wish for transcendence and an unending quest for advancement should then serve as necessary instruments of meaning in a life no longer bound by human limits.

1

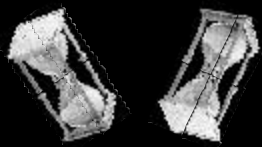
REFERENCES:

The following works of Sigmund Freud were consulted for this article:

Beyond the Pleasure Principle, ed. and tr. by James Strachey, Norton, New York, 1961.

The Ego and the Id, tr. Joan Riviere, tr. rev. and edited by James Strachey, Norton, New York, 1962.

Quotations are from *Beyond the Pleasure Principle*, 50.



You Only Go Around Twice

by Jerry B. Lemler, M.D.

“The Time Has Come,” the Walrus Said

This past spring, as part of my inducement for membership packet, I received a copy of Alcor’s “Cryonics: Reaching for Tomorrow” (CRFT). And you will recall this writer lauded it in this very column (3rd Qtr., 2000 issue). After signing on for suspension and, however precipitously, infusing myself into the movement, it became presbyoptically clarion that after seven cacophonous years CRFT required a revision.

Scintillating progress in two specific areas of circumscribed concern highlighted the requisition—nanotechnology and vitrification. Linda and Fred Chamberlain have lent their (usual) invaluable expertise to the revision project, while Rob Freitas and Rudi Hoffman are on deck for consultation on two of the four remaining unwritten chapters.

Work has been steadily progressing for five months, and I anticipate its completion in late January 2001. Originally slated to be titled, “Immortality for Beginners,” I have been persuaded by a new Alcor member, my daughter Jessica Lemler, to consider, “Dewar Unto Others: The Alcor Life Extension Foundation Biostasis Membership Manual.” I welcome your feedback on either of these prospective titles—or any others you might suggest.

I am positively humbled by Fred Chamberlain’s recent comment that, “This revision of CRFT is supposed to be the great jump forward needed to encompass both nanotechnology and improved ways of getting people into cryostasis.” Mr. President, I aim to make you proud.

Much of the final product is new and original material, with a like portion of face-lifting previously published data. Below is chapter one, “You Only Go Around Twice,” and as you biostat buffs will likely recognize, it is but a slight reworking of CRFT’s chapter one, “A New Medical Imperative.”

My thanks go out to all who have and are helping with this important project, including my bride of 30 years, Paula. Enjoy!

You Only Go Around Twice

The time is now.

A 52-year-old man has suffered a heart attack. Deprived of its vital blood supply, a part of his heart is failing. The exhausted muscle no longer pumps an adequate amount of blood, and a catastrophic downward spiral begins....

In another city an 83-year-old woman lies nearly motionless in her nursing-home bed. Advanced age, complicated by pneumonia, is about to stop her heart....

Across town a 29-year-old man has just entered an emergency room with a massive system-wide infection. AIDS has left his body ravaged by multiple disease organisms....

For most people these circum-

stances would herald the end of life.

For tens of thousands who lie in similar conditions in hospitals and nursing homes around the world, death is but hours or minutes away. Today’s medicine is powerless to repair the damage done to their bodies by disease or trauma. All it can do is give up and wait to pronounce such patients dead.

But these three people are not the stuff of statistics in the next day’s newspapers. Long before illnesses or injuries put them on death’s doorstep, they had the foresight to understand that physicians in the decades to come would not consider their condition terminal at all. The medical technology of the future undoubtedly will, in fact, be able to reverse the damage to their bodies.

The middle-aged heart attack victim, the elderly woman dying of pneumonia, and the immunocompromised AIDS patient each had the courage, the vision, and the initiative to provide for cryonic suspension back when they were still healthy and able to do so. While their contemporaries will be abandoned in the face of obstacles that today’s medicine cannot overcome, these three people will continue to be cared for. As a consequence, they will have a priceless opportunity—the chance to reach tomorrow’s medicine.

As each of these three patients slides into a deepening coma, their physicians decide they can no longer

(continued on page 32)



Blasé About Cryopreservation

by Michael R. Seidl

One of the most remarkable things I have found about most cryonicists (myself included) is the almost blasé way we discuss the possibilities of cryopreservation, as if it were nothing more than an alternative funerary practice or another item in any soundly thinking person's insurance program. This matter-of-factness is useful when dealing with new potential converts because it counterbalances a proposal (cryopreservation) that seems almost intuitively wacky simply because it differs so radically from what most of the world thinks and practices. Making cryonics mundane helps to ground potential converts quickly in the concrete world of fact and to counteract the response that we expect so seemingly radical a program to draw from the uninformed.¹ But the usefulness of the matter-of-fact approach in those circumstances does not explain why we remain so matter of fact even when speaking to others involved with or already interested in cryopreservation. I think the reason many cryonicists are so blasé about cryopreservation in all circumstances is more than marketing, more than a learned approach to communicating a seemingly strange idea to an unreceptive world. I think the moderation we bring to discussions of cryopreservation is a result of not being able to really grasp what the possibility of immortality means. We are all, some

more and some less, psychologically traumatized by the imminence of death, and even the promise of cryopreservation has not helped us past that trauma, has not yet allowed us to formulate a life-affirming language of real enthusiasm for immortality. The proposition that I am making is really very simple—we do not properly understand the impact of the knowledge of death upon people, but, among other things, it seems to constrain our ability to conceptualize immortality.

For most of us, the occasion when we first understood that people die, that all things die, is lost to childhood (Freud might say it has been repressed). The certainty of our deaths, the very fragility of our being, is so patent and omnipresent that, as a psychological defense, we live our days mostly as if we will live forever. But this pseudo-sense of immortality is no more a real conception of immortality than a neurotic's sense of control over his or her environment that arises from obsessive-compulsive practices is actual control over that environment. Instead, our knowledge of the certainty of our own deaths, gleaned at an age that makes that certainty seem natural and inescapable and then repeatedly sugared-over with defense mechanisms and repression to make the real horror of that certainty somehow palatable—makes it almost impossible for us to accurately conceive of what it would be

like to not die. The people of flatland cannot conceive of a world of three dimensions;² people in a world where time's arrow falls to earth for each of us individually cannot imagine that arrow's perpetual flight. As cryonicists, we are people presently condemned to death who have heard that it may be possible to elude death, but we have not seen a world without death, do not experience it yet ourselves, have evolved no language to explore it or tools to measure it. Of course we are somewhat blasé in discussing cryonics—what's to get excited about? We do not and cannot *really* know; moreover, we seem to sense that the conceptualizations that we have about immortality are flawed.

Humanity has put forth many ideas of what immortality would be like, all of which, upon reflection, are variations on the same theme. In the worst-case scenario, immortality is the curse of the Cumaen Sibyl, condemned to live on and on, shriveling, collapsing under age until her only desire is to die. The Cumaen Sibyl story is (ironically) the story of immortality without wisdom, life for life's sake without an eye to the quality of life; it arises naturally in the mind of anyone who has begun to feel the effects of age. Live forever? That's a horrible proposition, for my bones to ache more each year, my hearing and eyesight to get worse, more friends to die, my mind to

wander and hands to palsy, and finally to lay unable to move or assemble a coherent thought. Of course, that is not what nanotech offers (which cryopreservation hopes to carry us to), but the model is telling—the worst imaginable view of immortality is that it will simply mean more of the same, more of the bad parts of the same.

However, when we begin to look at the best views of immortality that have been offered, we see that our conceptions are similarly constrained, since mostly humans thinking about immortality have been unable to conceive of it as anything other than more of the *good* parts of the same. Pharaohs imagine themselves in pharaonic afterlives; Norse heros imagine themselves battling again the battles of their youth and retiring to feasting in the evening; Hindus imagine themselves keeping, and passing, and turning again and again through endless lives. Others imagine immortality as a sort of recumbent bliss, perpetual nirvana, clouds and angels or Sunday afternoon football games on every channel with an endless supply of beer and pretzels. Science-fiction writers sometimes describe it as endless permutations of lifetimes built on the human scale we already recognize, taking a job, mastering a profession, raising a family, moving on to begin again—the many lives of Lazarus Long.³ But the very paucity of these stories about immortal life—the fact that they are always the same as what we have already—make me doubt their reliability. It is as if flatland people speculating about 3D world were to explain, “there the lines will be *longer*.” I do not think that I am the only one who responds, “bleah—is that all there is?”⁴

Which brings me back to my proposition. Perhaps the reason we can be so blasé about cryopreservation is because all we can really envision from inside the world where death has always been certain is the negation of

death—we can only see “not dying,” and we lack a very clear view of what “living” might be in a world unconstrained by the limits of human mortality. I do not have a language of immortality, a philosophy of immortality, an aesthetic of immortality, or even a cuisine of immortality that really partakes of immortality. When I try to think about a world without the limits of mortality, try as I might, I think of what we have now, only longer; I think in two *larger* dimensions rather than in three. I think:

If I were immortal, perhaps I would read all three thick volumes of *Remembrance of Things Past*, that imposing Everest of literature the heights of which I routinely turn back from after 150 pages, or some even longer novel that might take years of reading to track its plot; I might compose such a book myself. I might go to 24-hour or 24-week-long movies. I might put down a stock to simmer for six months or drink only 400-year-old port. I might spend a year or a decade or many decades exploring physical pleasures or their ascetic converse. I might take a journey across a galaxy at speeds well below those of light, just to see what’s at the other end after my 200- or 300-year journey. I might teach myself every art, every musical instrument, every trade or profession, and invent more to learn. I might finally learn how to dance.

But every permutation I theorize comes out sounding like just more of what I have already. It is not different, not new, just what I have (or could have) already with the significance of time taken out.

Why do I think there will be more to immortality?—it is just a suspicion. If my proposition is correct, from inside our unhealth it will be almost

impossible to theorize health, to think as an immortal would when we have been crippled by the certainty of death; we will not understand what immortality means until we are bodily plucked from our mortality. But perhaps we can see glimmers, can begin to think about what might be truly different about immortality, and use those glimmers and thoughts to reinvigorate our dance with cryopreservation. I think Robert Heinlein skirted the edge of a view of something entirely new in *Time Enough for Love*,⁵ suggesting that it might take a human a very long time to come to a real understanding of love, to plumb the depths of what it means to be human, and to learn and share the full potential of human relationships. That idea seems to me to be not precisely an extension of what we have already, not mere prolonging or variations on a theme, but progression along a continuum to something that could not be had in a single human lifetime, to a synergy that cannot be guessed at from the parts that will go into it. I can feel the proposition of something truly new there, in the back of my head, something I cannot quite get my thoughts around.

Starting to think about this problem does seem to open a space, a tiny space, where we can begin to conceptualize anew. If our knowledge of our deaths terrifies us into forgetfulness of it, the possibility of living—of really living—mitigates that terrible silence a bit. Even though we lack a language of immortality, a language of true health, what cryonics appears to do is to let us ask that question legitimately, to ask what an immortal human would be like and, more important, to ask the less abstract question of what *we* would be like as immortals. That question is important, even without our having traversed into immortality yet, because it allows us to hypothesize health from within sickness. Having postulated, first, that we may not be well (psychotic, or a least neurotic as a result of

the omnipresence of death), and having postulated a different way of being that would result from being immortal in the world, a way of being different in more ways than just duration, we can ask whether there are other mechanisms we can use to bridge or partially bridge that gulf, to make ourselves—even if not immortally well—at least healthier than we now are.

1

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

NOTES

¹ Of course, as Ralph Merkle pointed out at Alcor's Fourth Conference on Life Extension Technologies (see. p. 20), cryopreservation is fundamentally conservative—it ensures that no further harm is done. But the reality of the conservative nature of cryopreservation doesn't stop the program from appearing radical when the everyday involves cremation or interment.

² See E. A. Abbott, *Flatland: A Romance of Many Dimensions* (1884).

³ See Robert A. Heinlein, *Time*

Enough for Love (1973) (the story of an exceptionally long-lived man who regains an interest in life while relating to his descendants his adventures under many names on many worlds doing many different things).

⁴ I do not mean to suggest that I think that I would not enjoy more life qua more life; I only suggest that a view of immortality that consists of alteration of life only in duration is surprisingly banal.

⁵ See note 3.

(Lemler; continued from page 31)

keep him or her alive. Breathing and heartbeat cease. The heart attack patient is vigorously resuscitated, but today's medicine cannot restore him to life. The elderly woman and the AIDS patient are allowed to slip into cardiac arrest quietly—their physicians decided long ago that resuscitation would be pointless, since they are powerless to reverse the underlying diseases, advanced age and AIDS.

As soon as heartbeat and breathing cease, a Transport Team from the Alcor Life Extension Foundation takes over the care of each patient. Circulation and breathing are artificially restored, and the patients are cooled and transported to Alcor's facilities. The patients are treated with drugs to minimize freezing injury, and then are further cooled to the boiling point of liquid nitrogen (-320°F, -196°C). Unconscious, unchanging, and in no pain or discomfort, these three insightful individuals wait with others who have chosen this daring option. Medical progress continues, and there is growing understanding of control of and control over the living world. By the

end of the 21st century, medicine becomes a science fully capable of healing and resuscitation at the level of the cell. Health care finally matures into a technology capable of the prevention and treatment of all major diseases and injuries, including the changes that occur with aging. Indefinite youth and health become the birthright of every person. Human life spans are open-ended and are measured in terms of centuries instead of decades.

Each of the three people in suspension is removed from the protective biostatic environment. First, the freezing-induced damage and age-associated deterioration are repaired. The damaged organs and tissues of the heart attack victim, the elderly nursing home resident, and the AIDS patient are repaired and replaced, and they are restored to a youthful, healthy condition.

When the patients awaken, nothing about them is time-ravaged. They have the faces and bodies of teenagers. Their skin is smooth and unwrinkled, and their minds are clearer and more active than they ever were during their first youth.

The memories and personalities of

each person are complete and unchanged. They are essentially the same people they were. The only difference is that they are again alive, healthy, and ready to face the challenges of an exciting new world.

Who are these three people? Is their story merely science fiction or wishful fantasy?

No, it isn't. They are members of the Alcor Life Extension Foundation. They share in Alcor's vision of a technology with the potential to treat almost any terminal condition: a future medical technology of such power that it can profoundly affect our lives today. This book is about that technology and about the revolution and prognosis it implies for almost all of today's "hopeless" patients. In the pages ahead, a seemingly fantastic proposal will be made: that by virtue of future medical capabilities, present medicine may have to lose almost no one.

1

*A non-profit,
tax-exempt 501(c)(3)
California Corporation*

**Alcor's Mission:
The Preservation
of Individual Lives**

Medical Director:
Thomas Munson, MD

**Medical
Advisory Board:**
Terry Grossman, MD
G. Mario Isidron, MD
Ravin Jain, MD
Jerry Lemler, MD
Robert R. Newport, MD
Anthony Pizzaro, MD

**Scientific
Advisory Board:**
K. Eric Drexler, PhD
Bart Kosko, PhD
James B. Lewis, PhD
Ralph Merkle, PhD
Marvin Minsky, PhD

Patient Care Trustees:
David Brandt-Erichsen
Gary S. Mead, Esq
Carlos Mondragon
Warren L. Robertson
Robert A. Schwarz

**Alcor Board of
Directors:**
Stephen Bridge
Linda Chamberlain
Kathleen Cotter, DC
Hugh Hixon
Ralph Merkle, PhD
Gary Meade, Esq
Michael Riskin, CPA, PhD
Stephen Van Sickle

**Advisors to the
Alcor Board:**
David Greenstein, OD
Joe Hovey
Lisa Lock
Judy Muhlestein
Mark Muhlestein
Karla Steen
Mathew Sullivan

Alcor Officers:
Fred Chamberlain, Pres.
Stephen Bridge, V. Pres.
Michael Riskin, Treas.
Linda Chamberlain, Secy.

Alcor Update



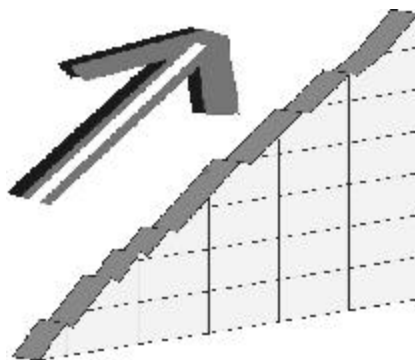
**Linda Chamberlain
Executive Director**



Higher Level of Marketing Activity

A large donation-grant (\$100,000 from the Miller family in Canada) has been made to support marketing activity on Alcor's behalf.

We would like to see this donation matched by donations from other Alcor members (see page 3). Those of you who have in the past expressed interest in seeing Alcor develop an aggressive



marketing program to increase our membership growth can contribute to this effort by making your donations now!

Please send your marketing donations (checks made payable to "Alcor") to Linda Chamberlain, who will see that they are deposited in a special account that has been set up for this purpose.

A prospective new member, Ron Wise, Vice President for Corporate Communications and Marketing with Bentley Health Care in Beverly Hills, and also Marketing Chairman for United Way of Los Angeles, has volunteered to assist Linda Chamberlain in this marketing effort.

This will bring powerful, professional marketing expertise—of the right kind: experience in the medical marketing arena—onto the Alcor team without the need to spend almost the entire original donation amount on the salary that would be needed to hire a marketing consultant with this level of experience and knowledge.

Initial marketing steps already taken have resulted in placement of half-page full-color ads (see page 36) that will be placed quarterly in *Anti-Aging Medical News* [the publication of the American Academy of Anti-Aging Medicine (A⁴M)], and also in the monthly magazine published by Life Extension Foundation.

The Life Extension Foundation will also publishes an annual directory of their products (*The Directory of Life Extension Supplements*). This year's directory will be called *The Directory of Life Extension Technologies*. It will include, in addition to the supplement products of the Life Extension Founda-

tion, a list of innovative clinics and a multipage feature on Alcor. This feature is currently under development by Linda and Fred Chamberlain and Ron Wise, with assistance by Dr. Jerry Lemler, Jennifer Chapman, and other Alcor staff members.

If sufficient additional funding is received for the marketing effort, Alcor would like to place additional ads in popular magazines. Members are invited to communicate to Linda Chamberlain (email: linda@alcor.org) about magazines they think would be particularly productive as advertising venues as well as thoughts about how to create ads that will be most effective for those magazines.

In addition to advertising in magazines, it is imperative that

Alcor's entire information package be top-notch. Every aspect of our image and communications will be reviewed and upgraded, including the web site and our marketing literature. In addition to these upgrades, we will produce a high-quality introductory video presentation that can be sold to those who inquire about Alcor services.

Help make all of this possible! Send your donations for the marketing project today. We have a tremendous beginning with the \$100,000 donation made by the Miller family from Toronto, Canada. Please help us double that. Please help us double our membership from 500 members to 1000 members in 2001!

Advances Related to Readiness for High-Risk Case

In advance preparations for a (high-risk Member) situation in southern California over the last several months, BioTransport support was used to upgrade many of Alcor's cryotransport capabilities. Considerable collaboration and support was given by 21st Century Medicine and Critical Care Research, Inc., at minimal cost, balancing values that otherwise would have been charged in standby fees.

As a result, in principle, neurovitrification could now be attempted. The Alcor Board is considering how to set a price on this new procedure, and Alcor

Why be the last generation to die before anti-aging science solves the life span problem?

There is an affordable option: Biotransport



To have a free information package mailed to you:

**Call Toll-Free
1-877-462-5267**

**email: info@alcor.org
website: <http://www.alcor.org>**



Alcor Life Extension Foundation
Recognized as the Industry Leader with
30 years of experience

A non-profit,
Tax-exempt, 501(c)(3)
California Corporation

*Alcor's Mission:
The Preservation
of Individual Lives*

Medical Director:
Thomas Munson, M.D.

**Medical
Advisory Board:**
Terry Grossman, MD
G. Mario Isidron, MD
Ravin Jain, MD
Jerry Lemler, MD
Robert R. Newport, MD
Anthony Pizarro, MD

**Scientific
Advisory Board:**
K. Eric Drexler, PhD
Bart Kosko, PhD
James B. Lewis, PhD
Ralph Merkle, PhD
Marvin Minsky, PhD

staff will need to develop forms for Alcor Members to upgrade to this approach.

Due to the engineering challenges, the equipment required for the extreme control needed for vitrification is currently only available for neuro patients (for more details, see page 4). The scaling-up required for a whole-body vitrification is likely to be quite demanding and expensive.

Funding will be sought for this project, but even with adequate funding, the engineering challenges could mean that such procedures will not be available except for neuro patients for many years. If adequate funding is not raised, it could be decades before this improved technology will be available for whole-body patients.

Members who have whole-body arrangements need to give careful consideration to the advisability of continuing with whole-body arrangements. Members who want to change from whole body to neuro should contact Linda Chamberlain (480-905-1906, ext. 113) and Jennifer Chapman (ext. 100), who are working together in Membership

Administration, for the forms required for this change.

Pricing and Standardization of Neurovitrification Arrangements

Part of the uncertainty in pricing neurovitrification is the need to



Hugh Hixon

better understand and define the cost and complexity of the changes that will be required for cooldown and storage. Cooldown now appears to be far easier than earlier anticipated, in the light of an experiment recently conducted by

Hugh Hixon that exceeded requirements specified by 21st Century Medicine at a lower complexity and cost. The results of this experiment also increase confidence that long-term storage may be provided without the level of expense and difficulty we earlier thought would be involved.

* * * * *

Continuing Education and Annual Recertification for Cryotransport Team

In July and August, two ACT-B (Basic Level) continuing education and recertification classes were held in Scottsdale. The following team members recertified at the basic level (ACT-B):

David Greenstein (Mass.)
Louise Gold (So. Calif.)
Hara Ra (No. Calif.)
Scott Larson (Fla.)
Sue Lubais (No. Calif.)
Tony Reno (Mass.)
Bob Schwarz (Ind.)
Andrea van de Loo (No. Calif.)
Peter Voss (So. Calif.)

A combination ACT-B/ACT-A recertification course was also held in late August. The following team members recertified at the advanced level (ACT-A):

Fred Chamberlain (Ariz.)
Linda Chamberlain (Ariz.)
Russell Cheney (So. Calif.)
Jack St. Clair (England)
Bruce Cohen (Ariz.)
Kathleen Cotter, DC (So. Calif.)
Hugh Hixon (Ariz.)
Robert Newport, MD (So. Calif.)
Mathew Sullivan (Ariz.)
Joe Tennant, EMT (No. Calif.)
Dan Weaver (Ariz.)



Jennifer Chapman and Linda Chamberlain



In October, after the printing of this issue, there was a basic-level class held. At that course the following are expected to recertify:

David Hayes (Ga.)
Steve Jackson (Tex.)
Mark Kaminsky (Mass.)
David Shipman (No. Calif.)
Monica Stevens (Tex.)

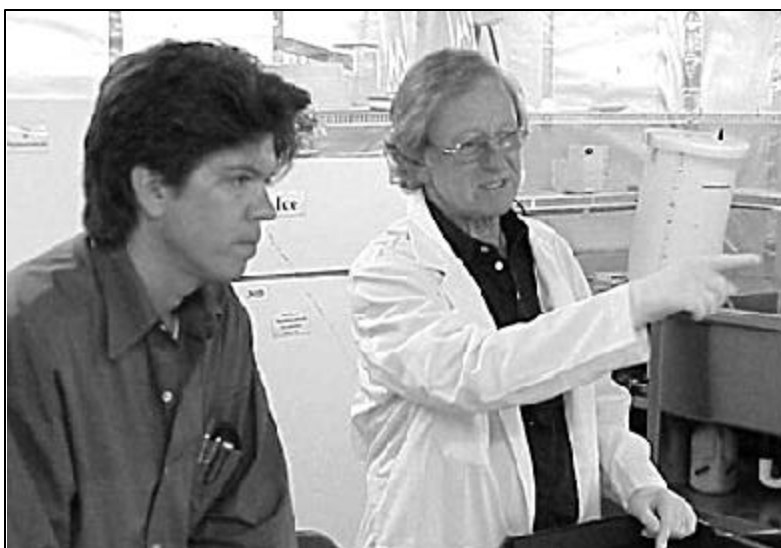
These classes stressed practical skills, interactions with hospital personnel, and enactment of a guided scenario in which the participants performed as a team to carry out all of the initial coordination, deployment to the patient's location, and transport after application of medications and initial cooling.

The Advanced Course emphasized set up, priming, and operation of the ATP (Air Transportable Perfusion) System, with a full half-day devoted to the delicate tasks of managing the system during surgical hookup to the patient's circulatory system (cannulation). The participants also were trained on a new mannequin from Sweden, learning how to best establish a subclavicular intravenous (IV) route into a patient if no IV ports or lines are otherwise available.

* * * * *

ACT Course Attendees Other than ACTs

Among those "sitting in" for the course on an audit basis was Stephen Valentine, an architect designing a huge cryotransport superfacility named "TimeShip." [This structure, which is projected to cost approximately 200 million dollars when fully developed, is anticipated to house a group of reanimation research laboratories



Stephen Valentine and Dr. Robert Newport

on the main level, along with a library and many other associated services. The plans call for vitrification storage of up to 10,000 patients on a lower, high-security level. Funding for the initial phase of TimeShip has been pledged by Saul Kent and Bill Faloon, on behalf of the Life Extension Foundation.

The project is well past the "talking stage." Engineers are being recruited to finalize a detailed Project Report as a step toward land

selection and start of construction. Stephen's auditing of the ACT courses, as well as other time he spent becoming familiar with Alcor's facility, was directly related to the planning of this project.

Others auditing the course were Jennifer and Leon Chapman, who relocated from Tennessee to Phoenix just before it began. Jennifer, who will be taking over the Membership Administrator responsibilities, sat in on the class as initial training for her new position.

Facility Upgrades and Improvements

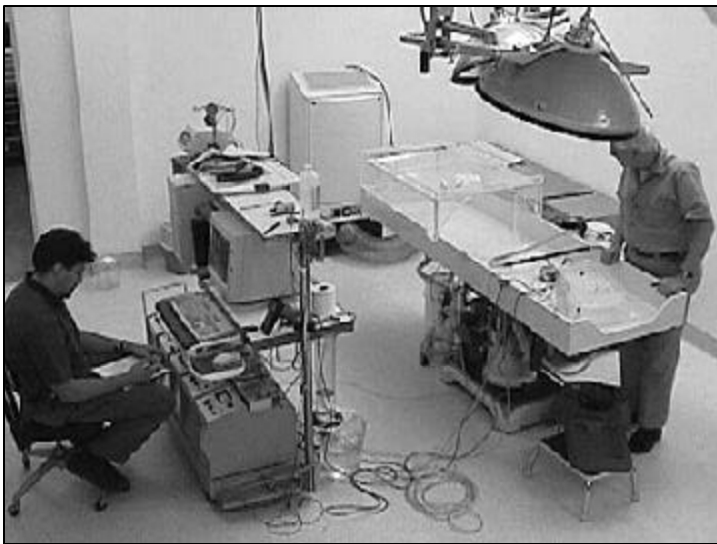
In the past three months, Hugh Hixon and Mathew Sullivan have spent over \$40,000 of BioTransport money making upgrades and purchasing new equipment including a Cryostar freezer, a 230-liter dewar, LabView equipment, cabinets, cooldown equipment, digital scales, a disperser, new medical kits, and surgical instruments.

The Cryostar freezer was purchased as an intermediate step

for long-term vitrification storage until a more cost-effective means can be developed. Once the new storage system is up and running, the Cryostar will be used primarily to anneal patients.

The 230-liter dewar is a multi-purpose dewar, used for such things as testing new cooldown concepts, being a backup for the Cryostar, and possibly used to fill DNA storage dewars outside the Patient Care Bay.

Additional LabView equipment has been purchased at the request of researchers at 21st Century



Medicine, Inc., in an effort to better meet their protocol. To help expedite this upgrade, Mike Perry has moved from part-time to full-time employment.

We have purchased two large cabinets for the new vitrification chemicals. Hugh has purchased and built cooldown equipment for vitrification. The initial expectation was to replace silicone oil with HFE, and use LN2 to cool rather than dry ice. For comparative purposes, Hugh experimented with gas cooling, and he found it superior to cooling with HFE.

Digital scales have been ordered to give us greater precision when making washout fluid or cryoprotectant and to reduce the amount of preparation time. We are in the process of ordering a disperser to reduce the amount of time necessary to make washout fluid and cryoprotectant.

In the past we have taken several hours to slowly add dry chemicals to a mixing reservoir to avoid clumping. Having a disperser should allow us to pour all of our dry chemicals into the reservoir at once.

At the request of Linda Cham-

berlain, most of our medical kits have been rebuilt for the purpose of rotating out old stock. Many of the meds in our inventory were long expired, some for as long as 11 years.

The expired meds are being sacrificed for a good cause; we are using them in training classes to give our cryotransport techs (ACT's) an opportunity for hands-on experience.

At the request of Dr. Kanshepolksi, we have purchased additional surgical instruments to better suit his needs in preparation for patient cryoprotection.

Operating Room

The refractometer data from our recent suspension showed mixed results, primarily due to improper use. The arterial data looked very good but the venous did not. The venous side was being processed in a very unusual way. The effluent dripped from the patient into a pan and was then removed by the cardiectomy sucker through the venous refractometer. The problem, we believe, was that the prism was not continually exposed to

effluent. After the venous refractometer was initially exposed to blood, it was drained for one half-hour while the surgeons continued to prep the patient. Since the refractometers only measure the first three molecules out from the prism, partially congealed/dried blood would have interfered with getting good-quality data. Future testing should help resolve this issue.

* * * * *

Response Capability Expansion



Kathleen Cotter, D.C., ACT-A, has recently been placed on retainer and received additional training to enable her to focus her skills and medical training more effectively during cryotransport coordination. Dr. Cotter will work with Linda Chamberlain in coordinating the efforts of the Alcor physicians and cryotransport team members when a standby rescue operation or last-minute emergency is coordinated. This backup capability will greatly improve both Alcor's response capability and our ability to function in the event we have multiple operations in progress.

* * * * *

Asilomar Conference Video Tapes

The talks at the Asilomar Conference (Fourth Alcor Conference on

Life Extension Technologies, June 2000) were videotaped at "broadcast quality" resolution using a digital format camera recently purchased by BioTransport. Since that time, Alcor Member Bill Seidel has offered to edit the tapes, making them available for sale. These should be ready for sale after the first of the year. Prices will be published in the next issue.

Web Site Upgrades

A DSL line for Alcor is under negotiation, which will likely be accompanied by a change of service provider and relocation of the Alcor web site to a new server. After that time, we expect to have better support for implementation of secure-order sales of books, membership applications, and all the other purposes of an improved web site. As part of a major marketing program (see page 35), the resources of Future Electronics in webmastering and graphics have been offered to Alcor on a complimentary basis. Along with Lisa Lock's consulting, we can expect a greatly upgraded web site over the next year.

Improved Phone Communications

Alcor's administrative operations are being smoothed out by a new phone system. It still has a few rough edges, but it has greatly reduced manpower loading. The vast majority of our serious inquiries these days come from the Internet (Alcor's web site); business calls and signup processes take priority, and the phone system is

effective for these.

As call inquiry volume increases, largely on the part of those who are curious or bored but not seriously interested, Alcor may need to set up a 900-line system. The new phone system will support this.

The new phone system's power is most evident in its program-mability for special purposes. Emergency calls come in on a dedicated line, and after a brief warning that this is an emergency line, all phone stations in Alcor Central begin to ring at the same time. This signifies that an emergency caller is on the line, and the staff is able to respond at all points in the building.

Alcor Names Two New Alcor Board Members and Three New Board Advisors

At the 10 September 2000 Meeting of the Alcor Board of Directors, two new Board Members were elected and three new Board Advisors were appointed. The deadline for this issue fell at the same time as the Annual Meeting of the Alcor Board, making it impossible to publish more details about these individuals. However, the next issue will have more complete



Kathleen Cotter, D.C.
Alcor Director

coverage.

Kathleen Cotter, D.C., and



Stephen Van Sickle, newly elected Director, works with Hugh Hixon (in 1997) to develop the ATP (Air Transportable Perfusion) System.

Stephen Van Sickle were elected to the Board of Directors by unanimous vote. The existing Board Members all feel that these two individuals will add greatly to the strength of the Board.

The Alcor Board also appointed three new Board Advisors as well as redefining and expanding the purpose of the Board Advisors as follows:

Board Advisors (not including the Medical and Scientific Advisory Board Members) shall be appointed by the Alcor Board of Directors as either candidates to be considered for election to the Board of Directors, or as belonging to one of the below categories of individuals whose advice may augment and strengthen the Board of Directors:

1. Retiring Alcor Directors and/or Officers who will give continuity to the Board by their continued participation at a less responsible level.

2. The Patient Care Trustees.

3. Alcor employees who are not eligible to be on the Board but who fill staff positions of critical responsibility. At the time of this resolution, the individuals filling the following Alcor staff positions would be added as Board Advisors: Cryotransport Manager, Member-

ship Manager, Patient Care Manager, and Bookkeeper. Employees designated as "Acting" for these positions will not be assigned Board Advisor status until the "Acting" designation is removed.

It is the responsibility of Alcor's President to notify the Board of Directors as to the names and email addresses of Alcor employees who are Board Advisors.

A Board Advisor who is not a Patient Care Trustee or Alcor employee shall be appointed for a period of two years, and shall then need to be reappointed by the Board of Directors, based on his or her participation record. There is no limitation on the number of terms that a Board Advisor can serve.

A Patient Care Trustee shall serve as Board Advisor for as long as he or she remains a Trustee.

An Alcor employee holding one of the approved positions above shall serve as Board Advisor for as long as he or she holds the approved position.

It is further resolved that there shall be no more than 10 Board Advisors at one time, such limit not to include the Patient Care Trustees or the Alcor employees.

Vacancies can be filled at any regularly scheduled Board of Directors Meeting. Board Advisors will be included on most Board email discussions of policy matters and will be included as telepresent participants of Board meetings with Alcor paying the call charges. In order to be telepresent and have such participation paid by Alcor, the Advisor must communicate in advance of the meeting and request inclusion.

The three new Board Advisors who were added are Lisa Lock (Editor of *Cryonics* magazine), Karla Steen (Legal Advisor), and



Lisa Lock



Karla Steen



Mathew Sullivan

Mathew Sullivan (Patient Care Manager). Reaffirmed as Board Advisors were David Greenstein, O.D., Joe Hovey, Judy Muhlestein, and Mark Muhlestein.

Robert Schwarz relected to Patient Care Trust

Robert Schwarz was the only Patient Care Trustee that was due for re-election this year. The Patient Care Trust Board unanimously recommends that he be re-elected to serve another five years based on his service record with that Board. The Alcor Board of Directors re-elected Robert Schwarz to the Patient Care Trust Board of Trustees by unanimous vote.



New Alcor Membership Administrator

Jennifer Chapman and her husband Leon Chapman have recently

relocated from Tennessee to Scottsdale in order for Jennifer to become Alcor's new Membership Administrator. As her first training for this position, and as mentioned earlier, Jennifer attended the ACT-A continuing education and recertification class. Jennifer will be working closely with Linda Chamberlain for the first several months as she learns her job.

The deadline for this issue as well as the press of other priorities made it impossible to write a more thorough introduction of Jennifer. Until we can expand on Jennifer's background in the next issue, we would like to include a life extension poem she wrote.



*Jennifer Chapman
New Alcor Membership
Administrator*

GAZING UPWARDS

Gazing upwards can be found
A shining wonder, bright and round

Says a child of the past
No one travels so far, so fast

With the passage of our time
A future child soon does find

To travel there is quite fond
And traveling proceeds beyond

Past beliefs and those of hence
A present child represents

While gazing upwards can be found
A shining wonder, bright and round.

How High Could Vitrification Costs Go?

by Linda Chamberlain



Important Research Breakthroughs

As Alcor Members are becoming aware, vitrification is now possible for neuro patients. The new ice-blocking chemicals and improved cryoprotective agents, together with the ability to control and produce extremely high cooling rates make this possible for biological systems of a limited size. The ability to successfully scale-up the procedure may take years to develop. It will also be a very expensive project (for more details, see page 4). The amount of funding that can be raised for this project will have a direct relationship to how long it takes to make whole-body vitrification possible.

Cost Considerations

One concern that many members have at this time is “how much will this advanced technology cost?” Members wonder if they will be able to afford the new technology, and, if they can’t, what will happen to them? Will costs have to go up for future members?

These are important concerns,

and the Alcor Board of Directors has given them due consideration. Alcor does not want to see any of our members in a situation where they may have been paying Alcor dues and insurance premiums (for biostasis funding) for decades, only to be told that the prices have increased dramatically, requiring that they provide additional funding in order to keep their biostasis arrangements in force. What if such a member were no longer insurable due to age or pre-existing disease? What if such a member were just not able to afford the additional insurance? The Alcor Board unanimously agreed that such a situation would be unacceptable.

Biotechnology is progressing at an ever-increasing pace. With advances such as stem-cell technology, therapeutic cloning, genetic engineering—to name just a few—becoming available even today, we have to assume that advances in the ability to place Alcor members into viable biostasis will also continue to advance rapidly. We can also safely assume that many of these anticipated advances will be costly—far more costly than would make it possible for Alcor to incorporate such advances without raising prices.

We naturally want the advances in technology. We would all like to see true suspended animation (the ability to be placed into biostasis and resuscitated at will) developed in our own lifetimes. But how can Alcor handle the price increases with fairness, humanity, and equity?

Previous Policy to Remain

This will continue to be handled the way Alcor has handled improvements in quality and technology levels in the past. If the costs can be absorbed, existing members will be “grandfathered” at their funding levels (barring run-away inflation, etc.). Future members may have higher funding requirements, but existing members would enjoy the benefit of the earlier rates. This is also an incentive for folks not to wait in making their biostasis arrangements.

If the costs are sufficiently higher than Alcor can absorb, the new technology or approach would be offered to existing members as an option. If the existing member could not afford the new option, it could be waived, and the existing member would still be given the level of technology for which that

member had contracted originally. It is currently the sentiment of the Board that previous (or lower) levels of technology will not be offered to new members, as Alcor has always had a policy of offering only the highest quality services and the best technology available for the preservation of the structures necessary for memory and identity.

An example of this policy in the past was the initiation of the Standby Option. Timely attention to the minimization of ischemic damage and other undesirable biochemical processes has always been understood to be extremely important. Alcor members are offered the option of arranging to have a trained team available as quickly as possible after cardiac arrest to make this improved scenario possible. This is a costly option, however, as it can run about \$2000 a day (if a physician is on the standby team) and the standby can go on for an undetermined number of days or weeks. This being the case, Alcor made Standby an option. Members who chose not to take advantage of this option, or who cannot afford this option, are not required to have a Standby.

In like manner, should there be expensive new technologies in the future, advances that are too expensive to be absorbed, the Alcor Board intends to make them available to existing members as options only, not as required changes to their contract that will increase the costs, possibly beyond some members' ability to provide such additional funding.

At the Annual Alcor Board of Directors Meeting on 10 September 2000, the Board passed a Resolution regarding this issue. The

Resolution is printed at the right.

Price Increases Are Under Study

The news about the ability to vitrify neuro patients is extremely exciting. Even though vitrification may only be available for neuro patients initially, the improved technologies will benefit our whole-body patients as well. Advances do impact costs, however. Alcor is currently evaluating the increases that will be necessary over the next decade. In order to grandfather existing members at current prices, it almost certainly will be necessary to increase the cost of future membership arrangements (in order to cost average these increases). No final decision has been reached at this time.

1

RESOLVED: Understanding that developing technologies could make it necessary for Alcor to raise prices, and in order to protect Alcor members from price increases that could make it impossible for some members to provide the additional funding, risking their ability to keep their membership in force, therefore, Alcor remains committed to:

1. Its grandfathering policy at current levels of technology.
2. Offering more expensive technologies to members as an option.
3. Making every effort to keep costs at a minimum.

Alcor Membership Status

Alcor has 516 Suspension Members (including 110 Life Members), and 39 patients in suspension. These numbers are broken down by country below.

Country	Members	Applicants	Subscribers
Argentina	0	0	1
Australia	12	2	4
Austria	1	0	1
Brazil	1	0	0
Canada	14	0	11
France	0	0	1
Germany	3	1	3
Ireland	0	0	1
Italy	0	2	2
Japan	2	0	2
Netherlands	2	3	1
Russia	0	0	4
TOTALS	516	92	272

No. of Countries: 19

Update on BioTransport, Inc.

by Fred Chamberlain
President/CEO



For the last six months, BioTransport, Inc., has engaged in two parallel efforts: (I) upgrading cryotransport capabilities, and (II) launching a business in the preservation of viable cells. In the near future, BioTransport will (III) offer an entirely new dimension in training to Alcor members.

CRYOTRANSPORT CAPABILITIES

Funds allocated to upgrading cryotransport capabilities have been largely expended, on an urgent basis. As a result, Alcor can now use new vitrifying compounds and rapid cooling techniques for all neuro patients. It has been proposed that we immediately begin applying these procedures for all neuro cases, and then evaluate our actual costs to see if increases to funding for neuro arrangements are actually necessary. Until efficient and reliable means for storage at temperatures just below the glass transition point are developed, long-term storage will continue to be in liquid nitrogen.

a. Technologies for vitrifying tissues have been licensed to BioTransport by 21st Century Medicine, Inc. All of the necessary perfusates and cryopro-

tectants, with two-component freeze blockers, are now on hand and ready for application. These compounds are extremely protective against the formation of ice crystals during initial cooling, so long as it is fast enough. They also provide a high degree of protection against the process of “devitrification” during rewarming, which has been one of the major obstacles in the development of reversible cryoprotection of large organs and whole organisms. Not enough is known yet to fully assess the extent to which ice crystals are totally eliminated in both cooling and rewarming, and in any case this procedure cannot yet be represented as “suspended animation.” However, it is a dramatic advance over earlier practices.

b. Surgery for direct access to brain vasculature has been developed, as part of FM-2030's cryotransport (see pages 10–11). The brain perfusion for cryoprotection in FM's cryotransport was extremely successful, even though the new vitrification compounds were not yet ready to use. Particularly startling was the fact that

this positive outcome was attained even after 30 hours of delay between cardiac arrest and the start of surgery, with poor initial cooling and lack of initial medications. Some anticoagulation may have resulted as a side effect of the terminal illness, but otherwise FM's case demonstrates that far more can be accomplished in the way of cryoprotection under difficult circumstances than was earlier thought possible.

c. Operating room automation has been implemented with LabView boards and software. Mike Perry is now engaged full-time in these upgrades. Hugh Hixon has rapidly and creatively implemented the perfusion circuitry and surgical container arrangements pioneered in FM-2030's case as the first steps toward development of an optimum system, and as a result of this the practices developed in FM's case can be immediately put to work in future neuro cases. Automated logging and display of temperatures with LabView are now part of the system. Measurement of perfusion pressures by LabView and auto-shutdown of perfusion in



the event of danger are close to being operational. These are major upgrades to quality and reliability in Alcor's cryoprotection procedures.

- d. Rapid cooling techniques recommended by 21st Century Medicine, Inc., were implemented and evaluated as satisfactory. Then, Hugh Hixon made further improvements by substitution of an alternate cooling medium, greatly reducing cost and increasing cooling rates at the same time. This not only upgraded the procedures for neuropatients, but it made the cooldown of whole bodies far more feasible within the cost constraints of current funding than was earlier hoped. It is too early to say that whole-body vitrification can be offered within the limits of current funding levels, but that is the goal. Development of whole body techniques under a new program described below, funded by a grant from another nonprofit corporation, is the key to finding if vitrification can be performed for whole-body patients economically.
- e. A CryoStar ultra-low temperature refrigeration unit has been purchased and installed to stabilize neuro patients just below the glass transition point.

As soon as reliable and economical methods are developed to store neuros and whole bodies at the more desirable temperatures, this device will provide a means to carry out slow reductions in temperature below the glass point to further increase the safety of neuro patients. This approach, while experimental, is expected to further reduce the danger of fracturing due to thermal stresses in the solid state for neuro patients.

- f. The next step, as already described, is to develop methods for extending all of the present neuropatient procedures as upgraded with new technologies to whole-body patients. This is a challenging project. It may be necessary to use different perfusates for the brain than for the lower body or some organs other than the brain, as more is learned about the different requirements for the tissues involved. Even more fundamentally, it will be necessary to convert storage apparatus now used with liquid nitrogen to operate at the higher sub-glass point levels that are optimal for the storage of vitrified biological materials. This project will be part of a proposed comprehensive program in upgrading cryotransport capabilities within Alcor, under a grant from another nonprofit corporation.
- g. BioTransport expects to acquire the whole-body-level capabilities proposed to be developed from Alcor when BioTransport takes on full responsibilities for cryotransport rescue. By then, BioTransport anticipates a high

and steadily increasing level of financial support from a business it is now launching, Cells4Life, Inc. All of the presently remaining resources in BioTransport are being devoted to that end. In the turnover of Alcor's rescue responsibilities to BioTransport, Alcor will be providing BioTransport with all of the means for performing this job, in effect giving it a unique and invaluable start in the role of vitrifying humans as a service. In exchange for this, Alcor will expect to receive a large share of BioTransport's income from Cells4Life. And that is the next subject in this update.

VIABLE CELL STORAGE

- a. Last spring, BioTransport re-evaluated its business plan and elected to redirect its commercial goals into viable cell storage, for pet cloning and other related purposes, including human therapeutics. A synopsis of this project was presented in the last issue of *Cryonics*.
- b. Since then, a viable cell culture and preservation laboratory has been established within space subleased from Alcor. A strong marketing and professional supervisory team has been recruited. To avoid the loss of its primary specialization in cryotransport services, BioTransport launched a new corporation, Cells4Life, Inc. Cells4Life expects to raise large-scale capital (several million dollars) over the next six to nine months so that it may capture a leading position in the marketplace for cell

storage. The company has carefully evaluated the potential market, the competition it will face, and on that basis has structured its operations to deliver higher quality, more comprehensive service than any other available, at competitive prices.

- c. The initial capitalization of Cells4Life, as suggested earlier, will require that it pay a significant portion of its gross revenues to BioTransport. BioTransport expects to pay a large share of this to Alcor in exchange for the assets it needs to carry out cryotransport rescue operations. The rapidly growing income Alcor and BioTransport receive from Cells4Life is expected to enable Alcor and BioTransport to develop and maintain strong capabilities for cryotransport rescue, with far less dependence on dues and donations (for Alcor) and investments (in BioTransport) than would otherwise have been necessary.
- d. Cells4Life is offering discounts to Alcor Members, and its future development is expected to be rapid. All Alcor Members and subscribers to *Cryonics* have received literature from Cells4Life and will continue to do so as it develops. Reports in *Cryonics* will attempt to keep pace, but those who desire the most up-to-date information must stay in touch with Cells4Life itself.

NEW DIMENSION IN TRAINING FOR ALCOR MEMBERS

Most Alcor Members are relatively young and healthy. Many

of them expect to avoid the necessity for cryotransport through anti-aging and careful living. Yet the future is uncertain. For that reason, we wear bracelets on our wrists and keep our life insurance current. As well as we can, we prepare for all eventualities. The future is tantalizing to us. We would desperately regret any turn of events that took our lives and thus took our chance to be part of the future away from us.

The ACT Program—Training

Many energetic and determined Alcor Members have followed this idea of preparedness to the point of attending ACT (Alcor CryoTransport) Team training sessions at Alcor. They have become certified to address almost any contingency and are “on-call” to respond with standby and transport procedures for those with these extra arrangements. Yet, the time required to train and recertify each year is a burden. “ACT’s” receive large discounts on their Life Membership dues, but now we are asking that new trainees take an EMT course. More and more MDs are joining Alcor teams. In some unique cases, Alcor has retained highly qualified research people as consultants, who, within limits, are part of the rescue infrastructure. What more could we ask?

More “On-the-Spot” Capabilities

We could ask for a *great* deal more! In far too many cases, emergencies arise where there is no time to respond from a great distance. Or, the member has made no standby arrangements, perhaps due to the cost. In such instances, the outcome could be tragic. In the last year, in two cases, Alcor Members

have died in situations where lack of warning and lack of nearby help stood in the way of the best response. If the members’ families had been just a little better able to help, the outcomes could have been much better. This is a serious deficiency. What can we do about it?

The answer is that we can create a limited course, perhaps available on videotape, so that neither travel nor paramedical skills would be required. This could still enable family members to help one another far more than in the past. It could equip them to understand the legal steps necessary to avoid autopsy and obtain a prompt certification of death so that rescue will not be held up unnecessarily. It could enable them to see exactly how they fit into the picture of their family member being an anatomical donation to Alcor, and how they could follow Alcor’s instructions over the phone to carry out initial procedures once the legal obstacles were out of the way, even if this were limited to simple application of cooling media. It could permit them to possess sealed medications to be handed to qualified medical personnel or ACTs who happen to be nearby, who might help but would otherwise be unable to do so for lack of supplies.

Is This Really Needed?

We can tell you that this is really needed. Almost every day, phone calls come in to Alcor with queries such as, “What could I do if something happened to my husband?” Or, it’s “my wife,” “my child,” “my mother,” “my father,” or just “my best friend” (who also happens to be an Alcor Member). There is a need for this, and we are going to do something about it, given the resources.

What Resources Are Needed?

The resources are the ideal, professional team that Alcor set out to build three years ago, but which still is staffed by Alcor administrative personnel or volunteers with medical credentials, who are also Alcor Members. Our teams have a larger and larger number of professionals, but they are busy with little time to spare. They cannot adequately set up and operate the kind of broad program Alcor needs to maintain its teams and also train all of the family members who might want to participate.

All you need do is to read the description of onrushing higher technologies described at the start of this article. Even the upgrades to whole-body vitrification cannot be made without additional funding. Who will take on the task of guiding this? Who will also continue the training of the people who will now have to carry out these more demanding procedures? And, who will train all of the families, too?

On the Horizon:

A Comprehensive Program

A broad development and maintenance program is necessary

to carry out all of the activities required in creating the kind of cryotransport program Alcor Members want. A lead physician, preferably full-time, is needed. Assistants for several key areas are needed with professional backgrounds. Perfusion is one of them; field standby and transport is another. Added personnel are needed to provide this group of professionals with administrative support. Hardware and materials are needed to develop methods for whole-body vitrification. This sounds good doesn't it? Are the people available? Can they be supported, financially?

The answer is that Alcor has promising candidates for all of the key positions needed. Also, there is a high potential for the first two years of this program to be funded by a nonprofit organization, which has supported research for years to develop related technologies. After the first two years, it is expected that cash flow from Cells4Life will carry the load easily. All that is needed is for the funds to be provided and for the people to be hired. As Cells4Life continues to expand and the income grows, BioTransport will take over full responsibilities for Alcor's

cryotransport operations. Outside funding from the other nonprofit organization can be reduced and then finally eliminated. The comprehensive program needed will be in place.

What Can You Do?

You can write Alcor and BioTransport letters about this. If you want to see the advanced technologies developed, if you want to see Cells4Life funded and launched like a Saturn 5 carrying an Apollo spacecraft, if you want to see a comprehensive cryotransport program funded right away for Alcor and then BioTransport, the strongest thing you can do is to *say so!* Let us know that these are important to you. We will pass your letters on to those who have the power to make all of this a reality. This is your organization. Tell us what you want. We'll do everything in our power to make it happen.

Above all, let us know specifically what *you* want. That's not easy for us to guess, and we need to get information to just the right members, on just the subjects that interest them. Send us the coupon below and you'll have gone a long way toward that goal! 1

Name _____ Alcor Member Number _____

Email address _____ (very important, if you have one)

☐ I'd like to know more about the "On the Spot" training program.

☐ Help me write a letter of support for the "Upgrades" project.

☐ I want to know more about storing my viable cells with Cells4Life.

☐ I'm interested in employment opportunities with:

☐ Alcor

☐ BioTransport

☐ Cells4Life

What Is the Insurance Buy-Back Agreement?

by Jennifer Chapman

Alcor Membership Administrator

In the Third Quarter 2000 issue, Linda Chamberlain wrote an article titled "Guarding Alcor's Long-Term Financial Security." In that article she pointed out why Alcor needs to be both the owner and the beneficiary of insurance policies that members are using to fund their biostasis arrangements.

Several members have called or emailed their concerns about "giving up control of their insurance policies" once Alcor is made the owner. That is a legitimate concern.

It has always been Alcor's policy to handle the funding of our members with the greatest of fiduciary care and responsibility. If a member desires to change their form of funding, to cancel

their membership, or for any other reason to have their funding returned to them, it is Alcor's policy to honor that request as rapidly as possible, with the understanding, of course, that the affected membership would terminate unless another form of funding were in place instead.

Members who make Alcor the owner of their life insurance policy need not worry that they are giving up control of that policy. Alcor gives its members a written agreement to return the ownership of the policy any time, for any reason, for just the small administrative fee of \$25.00.

This is called a Buy-Back Agreement and it is reproduced on the next

page for your use. This form is automatically given to new members who use insurance to fund their cryopreservation arrangements. If you have been a member since before this became a standard part of your membership paperwork, please make three (3) photocopies, sign, and mail them to me, Jennifer Chapman, Membership Administrator, Alcor Life Extension Foundation, 7895 E. Acoma Drive, Suite 110, Scottsdale, AZ 85260.

We will execute these forms, put two copies in your personal file here at Alcor, and return one for your personal file. If you have any questions, please give me a call at 480-905-1906, ext. 100, or email at jennifer@alcor.org.

'Twas the Night of My Suspension

by Jerry Lemler

'Twas the night of my suspension
And all of my kin
Were helping in the transport
to the "House of Chamberlain."

The ice had been gathered
By a skinny pack of elves
Who had lugged in the chests
In spite of themselves.

Next, I saw a red-nosed reindeer
With a long bushy tail
Who said, "My name is Rudi
Let's go to Scottsdale!"

Then, a fat man in a red suit
Appeared with a sleigh
Saying, "Everyone saddle up!"
And, "We'll be on our way."

"On Bruce and on Linda
Let's shake a leg Fred
On Ron and on Michael
We've got to stay ahead!"

So, they loaded me up
And the blanket was chilly
"You haven't felt nothin' yet!"
Said the plump man, dressed silly.

Then over the plains
And the mountains we flew
Above mesas and canyons
Till Sky Harbor came in view.

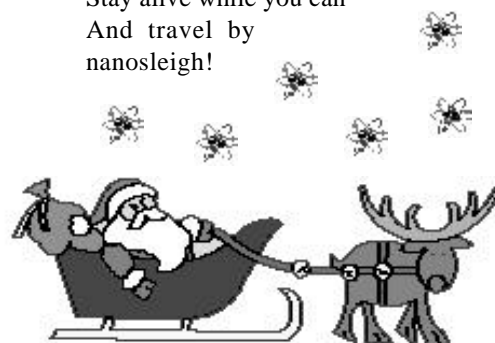
At Alcor they unpacked
The great sleigh and its rigs
When I heard someone ask
"Do you like your new digs?"

I was head under heels
So I really couldn't tell
But, from what I could gather
Sure, I liked it just swell.

Though it wasn't too roomy
And the commotion—there was plenty
I settled in okay for
The trip to minus 320.

Then Rudi and his troupe
I can't recall all their names
Wished me well, then departed
To play EBS reindeer games.

Though it was a fine sojourn
This much I must say
Stay alive while you can
And travel by
nanosleigh!



ALCOR LIFE EXTENSION FOUNDATION
7895 E. Acoma Drive, Suite 110
Scottsdale, Arizona 85260



MEMBER LIFE INSURANCE POLICY BUY-BACK AGREEMENT

This is an agreement between (Name): _____,
(address): _____
hereinafter referred to as "the Member," and the Alcor Life Extension Foundation at 7895 E. Acoma Dr.,
Suite 110, Scottsdale, AZ 85260, hereinafter referred to as "Alcor."

Alcor hereby agrees to transfer ownership, control, and/or to surrender any collateral agreements and/or to release any irrevocable beneficiary designations it may hold on the following insurance policies on the life of the Member provided that at such time as ownership or control of the policies are surrendered by Alcor:

- 1) The Member agrees to release Alcor, its successors, or assigns from any and all contractual obligations that Alcor may have relating to such life-insurance policies.
- 2) The Member agrees to pay to Alcor the sum of twenty-five dollars (\$25.00) to defray the administrative costs associated with the transfer.

Alcor further agrees that, as owner of the policies, it will not borrow against the policies, collect the accumulated cash value of the policies, or change the beneficiary or owner of the policies without the written permission of the Member.

This agreement shall pertain to the following policy or policies:

POLICY #	COMPANY	DATE ISSUED
----------	---------	-------------

_____	_____	_____
_____	_____	_____
_____	_____	_____

MEMBER SIGNATURE

DATE

Frederick Chamberlain, III, President
Alcor Life Extension Foundation

DATE

SEAL



(A series of semi-simultaneous CryoFeasts around the world)

**Celebrate the present, the future, and everything in between
with other Alcor members who share in your love of life!**

**Join us for the party, and enjoy great company, good food, and
fun and interesting conversation. See old friends and make new ones!**

**All Alcor members, members of other cryonics organizations, their
family, and friends are invited. There's lots of room . . . so the more the
merrier. Please make this holiday season even more joyous by adding
yourself to the festivities! We look forward to seeing you there!**

(Please RSVP with the host.)



Arizona CryoFeast

1:00 p.m., Sun., Dec. 3, 2000
Mark and Judy Muhlestein's home
5831 E. Placita Alta Reposa
Tucson, Arizona
phone: 520-615-9403

Directions:

From I-10, take Ina Road east until it becomes Sunrise (several miles). Continue on Sunrise to Craycroft. Turn left on Craycroft toward the mountains. Stay on Craycroft for 1.5 miles (exactly) to Placita Alta Reposa. Pink house on left corner of Craycroft and Placita Alta Reposa.

Southern California CryoFeast

1:00 p.m., Sun., Dec. 10, 2000
Co-hosted by David Kekich, Natasha Vita-More, and Kat Cotter
at the home of David Kekich
1533 Via Leon
Palos Verdes Estates, California
phone: 408-774-1298
(Please RSVP to Kat at 714-779-6466 or drkat@vfair.com)

Directions:

From the 110 South Freeway, take CA-1/Pacific Coast Hwy exit, turn right onto W. Pacific Coast Hwy, turn left onto Crenshaw Blvd., turn right onto Palos Verdes Dr. N., turn left onto Silver Spur Rd., turn right onto Montemalaga Dr., which becomes Granvia Altamira, turn right onto Via Fernandez, turn right onto Via Coronel, turn right onto Via Leon.

Northern California CryoFeast

4:00-8:00 p.m., Sat., Dec. 2, 2000
Tim Freeman and Jane Zhu's home
381 N. Fernwood Circle
Sunnyvale, California
phone: 408-774-1298

Potluck: Bring real food; desserts by request only.

Directions:

Take Hwy 101 to Sunnyvale, turn south on Mathilda Ave., take first left on W. Ahwanee, go .8 mile and turn right on Morse, go .3 mile and turn right on North Fernwood Circle (NOT South).

Up-Wingers: *A Futurist Manifesto*

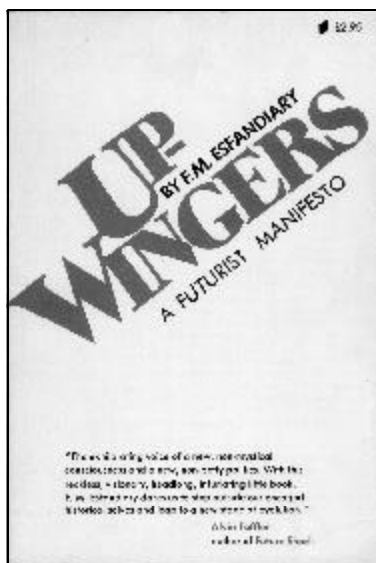
By F. M. Esfandiary

The John Day Company, 1973

Book Review by Mike Perry

Up-Wingers is the second in a series of four futuristic books by F. M. Esfandiary (the future FM-2030), a sequel to *Optimism 1*, which further elaborates the author's transhumanist, life-affirming philosophy. (The two later books are *Telespheres* and *Are You a Transhuman?*) In the introduction FM summarizes his attitude, answering critics accusing him of being overly optimistic. "My regret is that I am not optimistic enough. It is not possible to project the fantastic worlds which will continue to open up to us in the coming years. Worlds which far transcend my most daring optimism." The book takes its title from the contrast FM saw between conventional politics, with its division into right- and left-wingers, and what we should call "up-wingers," those few who are seriously striving to transcend human limits altogether. Alvin Toffler, author of *Future Shock*, commented shortly after the book's publication in 1973: "The exhilarating voice of a new, non-mystical consciousness and a new, non-petty politics. With this reckless, visionary, headlong, infuriating little book, F. M. Esfandiary dares us to step outside our encaged historical selves and leap to a new stage of evolution."

Not everyone shared his optimism, as FM was well aware. This is attributed in the book to four



main causes: (1) lack of self-esteem; (2) guilt from puritan upbringing; (3) lack of historical perspective; and (4) a legacy of theological and philosophical pessimism. To break the grip of this pessimistic outlook FM proposed a recognition of recent progress coupled with acceptance of the unlimited potential that appears to have opened before us. Our progress must proceed from our own efforts and must use rational, scientific means rather than mystical approaches, yet the possibilities far transcend what most people dare to imagine or take seriously. The betterment will not be of the external sort only (new, improved gadgets and conveniences) but, very significantly, will affect our own physical makeup. It should,

for example, include the control and reversal of aging and the augmenting of our intelligence. It should ultimately extend to a complete remaking and immortalization of the human organism. He thus foresaw our advance to a level that physically, mentally, and even morally is more than human. Once the open-ended future is accepted as our proper destiny, we can act rationally and uninhibitedly to bring it about.

This, we might say, is just good "mainstream" immortalism—it might have been borrowed from Robert Ettinger's books for example. (The second of these, *Man into Superman*, came out in 1972, a year ahead of *Up-Wingers*, while the first, appearing some eight years earlier, was the famous *Prospect of Immortality*, which introduced the world to the cryonics concept.) But FM's message was no mere echo of other writers. His outlook was and is controversial even among immortalists, favoring a kind of exalted socialism at a time when people increasingly demand to be left and to stand alone.

A basic feature of society, past and present, is the family. *Up-Wingers* outlines a proposal for doing away with it altogether and

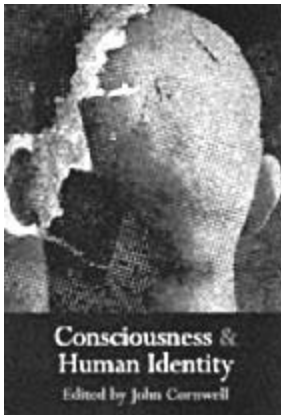
(continued on page 54)

Consciousness and Human Identity

Edited by John Cornwell

Oxford University Press, 1998

Book Review by Thomas Donaldson



Cornwell basically edited this book, although he did write one chapter. It contains good material for virtually any taste: from

may already know some of the names I've listed, and not know of work by some of the others, but Cornwell tried to make a good selection from among all those who have thought about our consciousness, our identity, and how they may work.

The philosopher John Searle discusses just how we might consider consciousness scientifically. His article describes 9 different mistaken beliefs held by various people (scientists and philosophers) against the possibility of scientific study of consciousness. Basically he argues that each of these 9 beliefs contain a variety of confusions about consciousness. For instance, "Mistake One" involves confusion between analytic definitions and commonsense definitions. The analytic definition defines a concept explicitly in terms of a completed theory; a commonsense definition simply limits the possible phenomena discussed. (He compares H₂O as an analytic definition with the commonsense definition of water as contained in rivers, lakes, etc.) The analytic definition comes AFTER scientific understanding of the concept. "Mistake Two" involves a confusion about the meaning of objective and subjective: science is objective, consciousness is inevitably subjective ... from which some conclude that consciousness cannot be studied.

He points out that these 2 words have two senses, depending on whether or not they are meant epistemically or subjectively. A statement is epistemically objective if it can be verified independently by anyone: "Rembrandt was born in 1606." It's epistemically subjective if it has no such verification: "Rembrandt is a better painter than Rubens." He points out that both words have another definition, too, as ONTOLOGICAL statements: a pain in my back has subjective existence because only I can feel it, a waterfall has objective existence. We can easily study epistemically subjective events. Searle goes through 10 more similar mistakes, all of which confuse the scientific study of consciousness.

The neuroscientist Olaf Spoerns discusses another feature of our brains, one that rarely gets the attention it deserves. Even without any history of damage, our brains differ from one another in an individual way. Yes, we can distinguish in any individual brain those areas that deal with (say) our ability to perceive human faces. However, that area differs both in location and size in different people: not by centimeters, but certainly by millimeters. We can discuss these regions in a population, but understanding how YOUR brain works requires us to know where YOUR regions are. (After pathology the

Steven Rose (biology, neuroscience) and Olaf Spoerns (Neurosciences Institute, San Diego) to philosophers John Searle (Professor of Philosophy, University of California at Berkeley) and Margaret Bodes (Professor of Philosophy and Psychology) to (yes!) theologians Nicholas Lush (University of Cambridge) and Fraser Watts (Lecturer in Theology and Natural Science, Cambridge). Psychology and computer science are included as well.

In one sense this means that no matter what you believe you may find some similar views among one of the authors. However it helps not just to look for similar views but for analyses of the different views, something good philosophers do, no matter what their official position. (It also sometimes becomes unclear whether you are reading a philosopher or a scientist ... though personally I felt that the theologians could be easily distinguished.) You

changes become much more radical). Our neurons differ structurally and in their actual operation. Not only that, but over time they continuously change. K. Brodmann drew his 1909 map of brain locations from only one human brain.

Spoerns argues from his work (and that of others) that our brains develop by constantly forming and reforming previous structures. He

calls this a selective theory of how brains work. This idea differs a lot from an alternative theory, in which our brains have no previous structure until information comes in from outside. Variation between brains acts only as noise rather than as playing the essential role it does in the selective theory.

These two chapters may give some idea of the variety of ideas

discussed in Cornwell's book. All of them have merit, even the theological articles, as explorations of problems involving consciousness, either human or animal. They may also serve as a brief entry into the variety of work now done on the problem of consciousness, for those who do not want to read whole books on the subject. 1

(Perry; continued from page 52)

raising children in communal "Child Center Homes." No longer would people have offspring through sex, but donated sperm and egg cells would be artificially combined by experts who would judge the suitability of producing a child with expected characteristics. Children, born to surrogate mothers, would be raised unaware of their biological parents and vice versa. A child instead, through visitations of interested parties, would "be conditioned from its very first day out of the womb to develop a sense of security from non-exclusive relationships with *many* mothers and fathers." Schools would be abolished and children would learn through their own interested efforts, aided by such advances as electronic hook-ups with the world at large. More generally, people would come to view themselves as citizens of the world and the universe, not bound by cultural, ethnic, or other regional ties that so often have fostered hostilities. Everybody would be everybody's friend, countryman, and family member, and the world would unite in love, harmony, and mutual respect.

A noble ideal, certainly—one

that was interestingly foreshadowed, somewhat, in Plato's *Republic* some twenty-three centuries earlier. Attempts to implement such ideas have so far proved unsuccessful, though we do have such advances as the Internet, which FM intelligently foresaw. Still it seems we are much too much the product of conditioning by natural selection, which favors our selfish genes and the sort of exclusive bonding that occurs in families with natural parents. Perhaps, with the conquest of death, we can do much better than this—when making offspring will no longer be very important anyway. (As if to confirm and practice his universalist stance, FM never married, not wishing to develop an exclusive attachment to one person.) Children will then become a rarity, though in a sense we'll all be eternal children.

On the more conventional, immortalist level, FM clearly had his priorities straight. "The most urgent human problem facing us is death. We must start from here. All other social problems are secondary." The defeat of death was not imminent, FM realized, so among the stop-gap measures he advocated "[f]reezing the body immediately after death to be revived in the future." His sincerity and seriousness would lead, eventually, to his

own self-chosen freezing. It permeates his writing, though the style is upbeat, informal, almost stream-of-consciousness. Some additional lines near the end of *Up-Wingers* are worth quoting:

"We Up-Wingers are building a New World which is resigned to nothing—no pain suffering or death.

"We want to overcome death. Do not ask us to accept death. We are prepared only to accept life.

"The day will come when the death of one single human—any human—will be so rare and tragic that the news flashed across the planet will stun humanity.

"Let us hasten that day when death will be something of our past—ahead of us only Life."

This, of course, is what we immortalists have been trying to say to the world for decades now, though so far few are listening. FM did listen and tried to get others to do so. His vision of the future can inspire us, even if not every detail is implemented as he set forth. None of us can fully imagine what the future will or ought to be like, though certain features shine through. Like FM, we can work toward a world without death in which every person has lasting value.

1

Continuing Advances

A possible antiaging drug, an improved quantum computer, a robot that designs and builds other robots, turning bone marrow cells into nerve cells—these and other advances make for a most interesting report this time.

Antiaging progress

Is the end of the aging process finally in sight? Are we about to enter a real era of transhumanity and biological immortality? For many years the only substantial way of increasing the maximum life span of mammals was calorie restriction, which has been shown to be effective in short-lived species such as mice, though whether and to what extent it would have similar effects in humans is still unknown. (Average life span, on the other hand, is relatively easy to increase, for example, by reducing infant mortality and getting better nutrition—but that will not make us more than human.) Why calorie restriction works is also not well understood; moreover, it does not cure senescence, but only delays age-associated mortality, and obviously has limited applicability. (You can only starve yourself so much, which besides is downright unpleasant to most people.)

Recent research now offers a possible second method of substantially extending maximum life span, and its workings are not so mysterious but offer insight that could soon lead to better treatments along the same line. One caveat is that the

method has so far only been tested with a species of roundworm. This, the tiny, ubiquitous *Caenorhabditis elegans*, has a simple structure and easy availability that make it a frequent subject of scientific study. Normally *C. Elegans* lives up to about one month; this was extended almost 50 percent or an extra two weeks through the use of catalytic agents that reverse a type of progressive injury known as free-radical damage (see below). A mutant strain that is much more prone to free-radical damage and lives a much shorter time was restored to a normal life span.

A roundworm is not a person or mammal, and two weeks is not the decades we hope to add (for starts) to the human life span. But there are basic similarities at the cellular level between the different creatures that raise hopes that what works for one will work for another, albeit on a far grander scale. As a body ages—whether worm or human—accumulating damage occurs from highly reactive, electrically charged molecules known as free radicals; oxygen plays an important part. Though necessary for life, it is also a corrosive substance that can tear apart molecules in cells. Oxygen-bearing free radicals, among other things, impair the function of mitochondria, the tiny structures within cells that are responsible for energy production. Damage to the mitochondria can lead to increased production of oxygen-bearing free radicals, a vicious cycle. Mitochondrial damage from free radicals accumulates throughout life and is a prime

suspect in the progressive enfeeblement of aging.

Free-radical damage is counteracted, to a certain extent, through antioxidants such as superoxide dismutase and catalase. (Vitamin E is another antioxidant in this class, and there are others.) The problem with these substances is that they are consumed in the process of conferring their beneficial effects, which are consequently limited. The new findings involve certain synthetic agents, EUK-8 and EUK-134, which mimic the activities of superoxide dismutase and catalase, but instead are catalysts. A catalyst is not consumed in a chemical reaction but is reconstituted, molecule for molecule, and thus can participate over again. The upshot in this case is that the beneficial effects that previously were limited are enhanced, to the point of extending a creature's maximum life span. Work is now under way with mice, and its outcome will be important in deciding if there is promise in this for humans.

The work was conducted by a 10-member research team, starting in the laboratory of Douglas Wallace of Emory University, Atlanta, Georgia.

Bone marrow cells turned to nerve cells

Bone marrow cells that would normally form into tendon, cartilage, bone, muscle, and fat have instead been induced to develop into nerve cells. The method involved exposing the cells to beta mercaptoethanol, an antioxidant

that appears to have a double-negative effect, counteracting chemicals that themselves prevent the formation of nerve cells. Both rat and human cells have thus been transformed. The rat nerve cells were transplanted into rat brains and were shown to survive for months. The result raises the tantalizing possibility of an easily available source of nerve tissue for treating spinal cord and brain injuries and diseases. That the nerve cells will function in a normal manner, remains to be demonstrated though there is no particular reason at this point to doubt it. The research was directed by Dr. Ira Black, chairman of the neuroscience and cell biology department, Robert Wood Johnson Medical School, Piscataway, New Jersey.

DNA tweezers

A pair of tweezers made of DNA is a step toward more general working devices at the nano scale. The tweezers, initially in the "open" position, can be closed by the addition of an appropriate "fuel strand" of DNA, which is consumed in the process. Another type of fuel strand opens the tweezers again, so the tiny tool could be used repeatedly and, with suitable automated inputs, motorized. This work was reported in a recent issue of *Nature* by Bernard Yurke and others at Bell Labs.

Insect antifreeze proteins identified

Dr. Peter Davies and other researchers from Queen's University in Canada, together with others from the University of Alberta, have determined the precise structure of insect proteins that protect against freezing damage in winter.

The antifreeze proteins, which have an unusual beta helix structure, are said to be 100 times more powerful than similar proteins in arctic fish, and enable the insects to survive temperatures as low as -30°C (-22°F). The proteins work by limiting ice crystal growth. Possible anticipated benefits range from better ways to protect crops against freezing damage to understanding and combating insect pests that survive the winter cold. Another possible application, of interest in cryonics, would be as an ice-blocking agent during patient cooldowns.

Quantum computer progresses

Ordinary computer capacity can be measured in bits, that is to say, the number of registers available in the computer's fast memory for storing patterns of 0's and 1's. In the newfangled quantum computer, bits are replaced by "quantum bits" or "qubits," with the difference that each qubit register is not limited to storing 0 or 1 but can store a superposition of the two. Overall, this allows the computer to perform many computations at once in parallel, which greatly increases its power for certain operations such as factoring large numbers. (This in turn is important in the field of cryptography, the making or breaking of codes.) The individual qubits also acquire much greater significance than their bit counterparts: adding one qubit to a quantum computer effectively doubles its power.

To date quantum computers are very small and primitive and progress is slow, one qubit at a time. The most advanced quantum computers have had four qubits but IBM recently announced a five qubit machine that, for the first time, is said to be substantially

faster on certain problems than conventional computers. Besides cryptography, quantum computers should handle database searches, such as searches on the web, much faster than their conventional counterparts. Isaac Chuang of IBM led the research team from IBM, Stanford University and the University of Calgary that developed the device. Chuang estimates that seven to ten qubit machines will be tested within two years. The U.S. National Security Administration and the Department of Defense are funding Stanford's efforts because of the relevance to cryptography.

Quantum-phase data storage

Another development relevant to the quantum computer is the storage of information in the waveforms of particles. Theoretically it appears that any amount of information could be stored in this way, though how this will work in practice remains to be seen. But recently University of Michigan professor Philip Bucksbaum announced the encoding and retrieval of an 8-bit byte of information in the electronic states of a single cesium atom. "Most other researchers are using the spin of a quantum particle as a storage medium," said Bucksbaum. "Quantum-phase data storage is much more flexible but also very new. It may turn out to be a step toward quantum computers, or it could be a complete dead end."

Robot designs and builds other robots

A swarm of grasshoppers is inexpensive to "make"; indeed, it costs nothing. The grasshoppers—assuming you have some to start with—do it themselves and are

quite good at it. And grasshoppers are quite sophisticated mechanisms—notwithstanding that humans may disparage them as pests—whose design and development was also free of charge. Human-made robots, on the other hand, are scarce, hard to design and make, and expensive, because they require intensive human labor. Futuristic scenarios in which robots themselves design and build other robots have been only fantasy—but this has now changed.

An ambitious project recently completed at Brandeis University demonstrates a system that both designs and fabricates simple robots. The robots are made of plastic pieces that are fitted together automatically and can be assembled into different shapes and structures depending on decisions at the machine level. Motors have to be added by hand—the only human intervention still needed. The robots, each a few inches in length, are then able to crawl about on the floor, to demonstrate that they have been well-designed for the task of locomotion their creator-machine was aiming for.

Researchers Hod Lipson and Jordan B. Pollack express their philosophy in a *Nature* article: “Our central claim is that to realize artificial life, full autonomy must be attained not only at the level of power and behaviour (the goal of robotics, today), but also at the levels of design and fabrication. Only then can we expect synthetic creatures to sustain their own evolution. We thus seek automatically designed and constructed physical artefacts that are functional in the real world, diverse in architecture (possibly each slightly different), and automatically producible with short turnaround time, at low cost and in large quantities.”

Sounds great—if it doesn’t get out of hand. But this too must be a concern, if our technology is to comprise autonomous life forms.

Telomere study sheds light on cancer

Telomeres, the lengths of DNA that cap the ends of chromosomes in our cells, shorten as we age and older cells are replaced by newer ones that are near though not perfect copies. Eventually, the telomeres in the latest generation of cells become short enough that normally they cease dividing. At some point after that, the cells die and are not replaced. The number of successive divisions or cell generations from the first, embryonic cell formed at conception—about sixty in this case—is known as the Hayflick limit after Leonard Hayflick who studied it in the 1960s. Telomere shortening thus appears to be a significant mechanism in aging, but it is also a possible defense against cancer, since it would tend to inhibit the runaway growth of tumors.

Yet in humans the incidence of metastatic growths increases with aging and the shortening of telomeres. What is going on? It appears that, even though normally the cells cease to divide when the telomeres become short, a protective function is also lost, so that rearrangements of the chromosomal material are more frequent. In some of these rearrangements, the cells not only do not cease replicating, but a gene is switched on to express an enzyme, telomerase, which lengthens the telomeres by attaching more DNA to the ends of chromosomes, thus negating the Hayflick limit. The cells then proliferate in an uncontrolled fashion.

Mice, as it turns out, normally

have the telomerase gene switched on anyway, so the critical shortening of telomeres with aging does not occur. (Yet mice live much shorter lives than humans, even when all opportunistic causes are taken into account, showing that the shortening of the telomeres is far from the only cause of aging.) Mice can still get cancer, but it tends to occur in different areas than in humans, that is, in masses of soft tissue rather than epithelial tissue (surface layers). In recent work, however, a strain of mice was created in which the telomerase gene is switched off, even in germ cells (where it is still turned on in humans and all naturally evolved creatures, since it is critical to reproductive viability). Successive generations of the mice have progressively shorter telomeres. After six or seven generations the telomeres are mostly nonfunctional, corresponding, at least roughly, to an aging human. As if to confirm this, the mice who become cancerous also showed a dramatic shift in the tumor spectrum in which epithelial cancers became more common, mimicking the effects seen in humans.

The conclusion seems to be that relengthening the shortening telomeres in humans would reduce the type of cancers that develop with aging. If the lengthening could be suitably controlled, the advantages of shortening might be retained for curbing most potential malignancies. Finally, we could learn in what ways and to what extent telomere shortening really is responsible for the aging process.

The study reported here was led by Ronald DePinho, M.D., and colleagues Steven Artandi, M.D., Ph.D., and Sandy Chang, M.D., Ph.D., of Dana-Farber Cancer Institute, Boston, Massachusetts.

SOURCES:

Antiaging:

Robert Cooke, "A Worm's Way To Long Life,"

<<http://www.newsday.com/coverage/current/health/friday/nd5845.htm>> (September 1, 2000).

Bone marrow:

Gina Kolada, "Researchers Turn Bone Marrow Cells Into Nerve Cells,"

<<http://search3.nytimes.com/search/daily/bin/fastweb?getdoc+site+site+58560+0+wAAA+Researchers%7ETurn%7EBone%7EMarrow%7ECells%7Einto>> (August 15, 2000).

DNA tweezers:

"Researchers build DNA motor that may lead to faster computer chips,"

<<http://www.cnn.com/2000/TECH/computing/08/09/dna/index.html>> (August 8, 2000).

Insect antifreeze:

"Canadian Scientists Find Potent Antifreeze Protein That Equips Insects To Brave Winter," <<http://www.sciencedaily.com/releases/2000/07/000727080542.htm>> (July 27, 2000).

Quantum computer:

"IBM develops world's most advanced quantum computer," Reuters (August 15, 2000). <<http://www.cnn.com/2000/TECH/computing/08/15/quantum.reut/>>.

Quantum-phase data storage:

R. Colin Johnson, "Quantum laser turns electron wave into memory," *EE Times* (08/31/00, 2:39 p.m. EST), <<http://www.eet.com/story/EG20000831S0019.html>>.

Robot builds robots:

"A robot that can reproduce," (September 5, 2000), <<http://news.cnet.com/news/0-1006-200-2701161.html?tag=st.cn.sr1.dir.>>.

Rodney Brooks, "From robot dreams to reality," *Nature* **406**, 945–47 (August 31, 2000), <<http://golem03.cs-i.brandeis.edu/download/naturebrooks.pdf>>.

Hod Lipson and Jordan B. Pollack, "Automatic design and manufacture of robotic lifeforms," *Ibid.*, 974–78, <<http://golem03.cs-i.brandeis.edu/download/naturegolem.pdf>>.

Telomeres:

Todd D. Ringler, "Telomeres, Cell Crisis Key To Cancer, Mice Indicate," <<http://unisci.com/stories/20003/0810001.htm>>.

Douglas Hanahan, "Benefits of Bad Telomeres," *Nature* **406**, 573–74 (August 10, 2000).

Steven E. Artandi et al., "Telomere Dysfunction Promotes Non-Reciprocal Translocations and Epithelial Cancers in Mice." *ibid.*, 641–45.

How to Submit Stories to LifeQuest

Please send submissions to:

Cryonics magazine, Alcor Life Extension Foundation, 7895 E. Acoma Drive #110, Scottsdale, AZ 85260, or email them to fred@alcor.org.

If in hard copy format, please also include a diskette (textfiles or one of these: Microsoft Word 97 & 6.0/95, or Pagemaker 6.5. Graphics (jpg/gif preferred) should be in color if available, as these are compatible with Alcor's web site. LifeQuest stories may be published on Alcor's web site barring agreed restrictions to the contrary.

Alcor's anticipated rights include one-time publication in *Cryonics* magazine and web site inclusion, nothing more, unless provided for in writing. Additional information on submissions may be found inside the front cover of *Cryonics*.

You *can* help others see why what Alcor does makes sense, by sharing your feelings, your deepest insights with them, in the form of LifeQuest fiction (short stories) or poems. If you have a vision, put it in writing and submit it for consideration.

Visions of the Present, Visions of the Future, Visions of Unbounded Life

LifeQuest

Fictional stories reprinted from the late 1980s

The stories that follow appeared in *LifeQuest*, a semi-annual collection of life-extension fiction, from May 1987 to November 1990. They ranged from practical cryotransport dilemmas to far-reaching possibilities of uploading, nanotechnology, and the deep-time aspects of living in space colonies. The contributors comprised a rapidly broadening group of authors at the time publication ceased in 1990.

Now, in a special section of each issue of *Cryonics*, we bring you reprints from past issues of *LifeQuest*, along with new stories contributed by authors from our wide readership and other sources. If you are a professional science-fiction writer, or even if you are not, we invite you to submit your stories for possible inclusion.

Table of Contents

GENTLE INTO THAT,
GOOD KNIGHT
by Thomas Meyer
(Original Publication) 59

WHY NOT?
By Fred Chamberlain
From Issue #9, Nov. 1990 63

GRANDPA CHIPPERS
by Linda Chamberlain
From Issue #2, Nov. 198766

GENTLE INTO THAT, GOOD KNIGHT by Thomas Meyer

Timie's heart nearly leapt from her chest. "It's you! It's you, Gransaw!" she squealed and pointed at his wristband. She had been holding his hand and watching her own band when suddenly the one he wore began to glow.

Heads swivelled toward them from every direction. Timie's mothers stared at the wristband and then at each other in disbelief. A low rumbling murmur spread throughout the clan as they realized who had been chosen. The teenagers rolled their eyes in disbelief, then waited hopefully in the event that Gransaw declined.

A transport silently glided along the conveyance rail up the many flights toward their section. They were in row 1278, nearly halfway to the top of the disneyseum, and it took the vehicle a full half-minute to arrive. Gransaw fidgeted slightly, pensive, but Timie tugged insistently at his sleeve. "Go, Gransaw. Go! The port! The port is coming! Huuuuurry!"

People from adjacent clans watched. To them, and from a distance, he looked more or less like everyone else. But his own clan knew differently. There were wrinkles around his eyes, which seemed strange and remarkable. He might look young, but he was several generations older than the oldest among them, a stranger in a strange future thanks to the decision he had made centuries earlier to have his dead carcass preserved in cryonic suspension. While humans died by the billions, Gransaw refused to go gently into that good night. He had calmly walked up to the roulette wheel of life, place his bet on 00, and won.

Winning that bet, however, did not necessarily bring him respect from his clan. Despite being the Uber-patriarch of them all, he seemed generally clueless. And

useless. And bizarre. He was short, short and rather unhandsome. The elders among the clan considered him churlish and standoffish. The younger just avoided him. That never seemed to bother him though. In fact, he usually preferred solitude. Except for Timie.

Gransaw (that's all anyone called him) had a soft spot for children. There weren't as many children around anymore, and he delighted in them. His taciturn demeanor changed instantly in their presence. He loved to hear them talk. Kids were the only ones that ever said anything to surprise him, he often said. And then there was Timie. She had somehow wormed her little way into his heart, and she followed him around wherever and whenever she could. Mother1 was quite unhappy about this development, but Mother2 seemed to think it harmless. Plus Gransaw was a very conscientious babysitter.

Timie would talk with Gransaw for hours. Often they discussed her eight-year-old concerns, but just as regularly she would pry from Gransaw the ancient stories that everyone else avoided. Stories of the distant past, stories of hardship and privation, stories of pain, and love, and loss, and all that. She loved his stories and she loved Gransaw more than anyone else other than her momma 1 & 2. And now here she was, having persuaded him to join her and the clan at the disneyseum. And Gransaw had been chosen!

The transport halted now at the end of his row, and Gransaw reached for the hatch button. As soon as he touched "ACCEPT" the vehicle glowed bright green, brighter even than Timie's hair, and that was pretty bright. His shirt began to glow with the same color. Then Gransaw turned around and saw that the shirts, blouses, and djalabas of all two thousand three hundred and forty-nine of his descendants gleamed green accordingly.

"You can do it, Gransaw! You're the best," shrieked Timie, much to the amusement of those around her. He looked at her, blew a tiny kiss her way, then surveyed the ocean of his offspring.

A half-smile crossed his usually-impassive face, then floated away. He turned toward the transport and stepped inside. It was designed to hold twenty people, and for the first time he realized just how big it really was. The door swished shut behind him, and he grabbed the strap just before it dropped down toward the playing field.

When he was young, he had marveled at the ability of huge, heavy jet airplanes to float through the air like feathers. Much the same astonishment gripped him when surveying the size of the disneyseum. From the window of the transport he looked across the one-kilometer span from his side of the field to the other and then the astonishing length of the field, which was triple its width. It was full to capacity on Clan Day, over three million spectators in the stands, with several billion watching on their own vids at home. The members of his extended family had come from all over the world, several High Orbitals, the moon, and Mars. Others, he knew, had come from much, much farther to experience the Mecca of ClanSport.

Hovering in mid-sky was the all-important sun-mesh, without which it would have been nigh impossible to bear the heat and strength of the sun's rays. Gransaw thought back many centuries to a hot, hot World Series game, played in St. Louis. He was just twelve, and his father had somehow talked his son's way out of school that day. The temperature was 114 degrees Fahrenheit in the shade. One of the players collapsed. Dad told him to hold an icy coca-cola cup between his wrists to 'cool the blood.' Strangely, it actually seemed to work. What would his dad say if he could see this place?

He stared at the field as it drew nearer. What seemed a tiny, meandering river of concrete from high in the stands was now a massive speedway that twisted and turned, rose and fell. It was surrounded by high, gently-sloping walls to prevent the playpods from spinning off into the crowd. Behind the starting line were hundreds of brightly-colored pods, scattered willy-nilly where they had been abandoned after yesterday's last game. Gransaw spotted his ridiculous green one, near the back of the pack—not exactly what he'd call 'pole position.' A few of

the randomly chosen drivers were already hopping into their pods.

Just a few meters walk took him from the transport to his pod. It was bigger than he expected and funnier. It looked like a giant, streamlined green marshmallow on wheels. He chuckled, turned, and looked up into the stands. From the green clan section he could see a few people standing and waving toward him. How was that possible? Then he realized that a large holovid had been activated in the sky directly in front of his clan, so that they could experience their representative's movements close-up during the race. Gransaw waved and imagined he could see Timie jumping and flapping her arms at him, too. He looked inside the playpod and laughed out loud. It was even more marshmallow-like, with cushiony padding in every direction, save for a plush chair with generous net restraints, a sort of half steering wheel, resembling those he'd seen the kids using in VR chambers (and which also resembled the 'stick' used to fly small aircraft in his youth), and a couple levers on the right side of the circular interior labeled only with colors—the right lever green, the left red. He clambered inside and looked around.

Nothing more. No speedometer, no gas gauge (not surprising, as oil hadn't been used in many, many years), no battery indicator, no vid/radio. Very plain. He actually was a bit disappointed. Although he couldn't see them, Gransaw knew that hidden cameras were recording his every move, from every angle. He resisted a strange old temptation to stick his finger in his nose.

The playpod's door clicked shut, and Gransaw's head swivelled around to take in the 360-degree view of the course. He was bunched in with dozens of other pods and could see their occupants quite clearly. Most were adults of indeterminate age, but a couple were teenagers with fanatical grins on their faces. They were, like all teens, skilled VR addicts, and PodRacer was the number-one selling game of all time.

An invisible speaker summarized the rules to the few who didn't know them—

and Gransaw was one of this pathetically select bunch. Push the green lever for go, the red one for stop. Three laps around the entire course. Speed in finishing earned one the SpeedPrize. Touching was bad. Touch another pod—points deducted. Touch the obstacles—more points deducted. And the obstacles—now they were something. They were entirely illusory—holotrees and holopeople, holocanyons and holo—anything that the course designer could dream up. The holos were everywhere and nowhere, appearing unexpectedly. Although they seemed solid, a pod driver could sail through them unscathed. Except for the points. Points were deducted whenever a pod touched a holo. Fewest touches garnered the TouchPrize. Finally, the GrandPrize went to whomever attained the mathematically most desirable combination of highest speed and fewest touches. That was impressive—and the winner was often in the middle of the pack and completely unaware of victory.

Without further warning a clanging startled Gransaw, his controls flashed yellow, and the playpods around him began swinging wildly in every direction, banging repeatedly into his own. “What the hell?” he yelled at no one in particular. An ancient memory of bumping mini-cars at the St. Clair County Fair flitted through his mind.

With that a bright powder-blue playpod whizzed past him at full throttle, traced a jagged course sideways across the track, and rushed directly up the track’s sloping side until its center of gravity shifted enough to tumble it back down onto the track and into several other spinning pods. They scattered like bowling pins. The offending pod righted itself and began moving in slow, cautious circles.

Gransaw surveyed the chaos before him. Gradually the other pods moved away from him with awkward, uncoordinated movements, across the starting line and down the course, where holo-obstacles began to appear. “These people are drunk!” he laughed. His pod was the only one that hadn’t moved, save for the hits it had taken from the other drivers, and those didn’t count as penalties until one had crossed the starting line. He rubbed his chin. He pushed on the green

lever and felt his pod lurch forward. He held the wheel and steered himself in lazy eights. “Gently, gently. You know this.” An old, familiar feeling crept over him.

What was wrong with the rest of the racers, he wondered. He thought about the wretched directional sense of modern humanity. The people never seemed to know where they were or how they got there. All vehicles were self-driving, self-navigating. The vast majority ran on SilentRail or Maglev, almost never on actual wheels. Then he thought about his teenage son long ago. His son had loved those early video games, played them night and day. But when it came time to pass his driver’s test—well, that had been a different matter entirely. And that was all. It was simple. These people had never learned to drive. And despite the enthusiasm of the teenagers, their VR games were simply not the real thing. He was racing against hundreds of twelve-year-olds who had suddenly been handed the keys to daddy’s car.

But halfway to the top of the disneyseum things looked rather different. The race was on, and their pathetic clan representative, Gransaw, was still circling around behind the *starting* line as the other pods were jostling forward about each other. Some of the clan members snorted derisively. Timie watched the pod-view close-up holovid hovering above their section, pressed her tiny thumbs into her palms and prayed, “Please, Gransaw, go. Please go!”

Then a most curious thing happened. Gransaw took his hand off the green lever, shifted sideways in the podchair, pulled up his right leg and extended it through the large holes at the end of his restraint webbing. Then he lifted his foot and placed it on the green lever.

This was simply too much for the teenage clan members to take. Several threw their heads back in disgust, stood up and very publicly removed their shining green garments. A few parents glowered, but said nothing. Many finally ignored the clan-centric holovid and settled down to watch the race as it proceeded on the course, writing off their clan completely.

And that was when it began, naturally. Slouching slightly to the left in his

chair, and with his right foot sticking out but placed firmly on the green lever, Gransaw guided his playpod forward in an unerring straight line, picking up speed as he entered the race. At first, virtually no one noticed him because he wasn’t even close to the race’s action. But as his pod moved faster the holo-obstacles began to appear in front of it. With lightning reflexes his pod swerved, sped up, slowed down, whatever was needed to prevent a ‘hit.’ People began to notice this stray pod that moved so adroitly.

Gransaw saw that his delay had actually helped him in the race. The other pods that had been so bunched up earlier were now spread out and hitting each other with much less frequency. There was room to pass. And the drivers had sorted themselves out into two primary categories—those who drove as fast and recklessly as they could—ignoring all the holo touch penalties—in order to win the SpeedPrize and those who tried to avoid the holo-obstacles when possible, which slowed them down mightily, but might garner them the TouchPrize.

With stability and grace Gransaw’s pod dodged through the tight walls of a holocanyon, avoided colliding with dozens of slower drivers, and bore down on the speed-leaders of the race, whose control over the pods was tenuous at best. The speediest often overcorrected while steering and would then either roll over, collide with someone else, or head straight up a curved wall of the course’s edge.

Several clan members glanced back and forth between the distant track and their clan holovid. It was him. Their Gransaw. His bright green pod was moving forward at an unbelievable rate and with steering skill that no one alive had ever seen. The touch counter showed 0000! The speed counter showed 67 kph! Timie’s mother2 grabbed her. “Look! Look! It’s your Gransaw! Look what he’s doing!”

As he approached the speediest competition, two playpods bumped slightly, but that was enough to send them rocketing toward the side slopes. Then they came careening down in a pincer movement directly on Gransaw. The entire crowd was watching now.

Three million people held their breath, expecting his pod to brake to soften the blow as they struck. Instead, Gransaw sped up and squirted forward from between them just before they slammed into each other and spun utterly out of control. The crowd roared its approval. With that, every clan's holoovid split-screened to show not only their competitor but also the close-up of Gransaw.

Over two thousand green-clad spectators sat astonished, mouths open. A few teenagers sheepishly replaced their green garments. Gransaw's pod whipped back and forth upon the track, evading giant boulders, leaping deer, crumbling buildings, and the few remaining leading pods. As he took command of the race, another roar cascaded from the stands. On the holoovid his average speed increased to an astonishing 88 kph. Finally his own clan members rose to their feet and began chanting, "Gransaw! Gransaw! Gransaw!"

He had completed the first lap without a single touch and was beginning to lap the slower pods. They never saw him coming. One second he was roaring up straight behind them, and the next he would swing past them as if on autopositioning. He drove like a RoboGuide! No human alive had such dexterity. The holo-obstacles kept coming, and they seemed to be getting harder. Flocks of sheep forced him to slow. Trees now started to fall in front of him. But the other pods were even more spread out, and that seemed to help greatly. His average speed rose to 104 kph by the end of lap two. The holoovid showed Gransaw's face close up. The other competitors were sweating profusely from their efforts. Gransaw was smiling, sometimes laughing. He was still slouched to one side, looking simply casual. And he was utterly cool.

As the final lap began, three million people rose and scrambled up to stand on their seats for a better view. Someone began the old Champion chant, but this time there was universal acclamation in the voices of the crowd. "CHAMPION! CHAMPION! CHAMPION! CHAMPION!" Amidst the din the tiny voice of Timie was powerless, but she still sang/screeched with all her heart, "GRANSAW! GRANSAW! GRANSAW!"

With half a lap to go the holo-

designer threw the worst at Gransaw. No one had ever seen obstacles like this—an avalanche, a flood, disorienting mirages, and finally an earthquake that split the track with a gaping holofissure from side to side across its entire width. Gransaw cleared several laggard pods for the second time and saw his last challenge. On the holoovid, the crowd could see his surprised look and then the determination cross his face. His current speed increased—120, 130, 140 kph. Was he losing control? His pod began a drift to the side. 150 kph. The black fissure approached rapidly. His pod began to rise along the curved edge of the track, higher and higher. His speed never slackened. His foot compressed the acceleration lever to maximum. The green pod reached the lip of the curved barrier and hugged it, remaining under total control despite its tremendous speed and height above the track. It zipped past the trailing edge of the holofissure without touching while the spectators screamed insanely.

The screaming never stopped. Every clan section undulated. Gransaw crossed the finish line, a brief smile flickering on his face as he noticed that the old 'checkered flag' was still used. He pulled his pod over to the disembarkation area and waited calmly for the others to finish. He thought how nice it would be to have a real cigarette, like in the old days. But, of course, that was one of those things that didn't exist anymore. And modern cigarettes—well, they just weren't worth the effort.

Finally the last stragglers crossed the finish line or simply abandoned their playpods on the track if they gave up. A loudspeaker commanded the participants to disembark. Gransaw opened his padded, slightly humming pod, and stepped out into a shocking wall of noise. Several other playpod competitors rushed to his side and pumped his hands. He looked around the disneyseum, facing every section in a 360-degree turn. The drumbeat of stomping grew louder with each section he faced. At last he threw his fist up in the air jubilantly, and the sound became so fierce that it seemed as if the mammoth structure would crumble beneath the vibration.

A gigantic pyramid-shaped holoovid flickered to life above the center of the

field, and there stood Gransaw grinning and laughing. Beneath him were his race statistics: Average Speed 108 kph—Total Touches 000. New world records in both categories. But not just that—these were records that would never, ever be approached—much less broken—during the next two hundred years of the game's popularity.

"CHAMPION! CHAMPION! CHAMPION!" Every adult in the audience knew that this was the most unforgettable playpod victory of all time. And they had been fortunate enough to see it happen in person. In over a billion households, the rest of the world was just as astonished, running around their habitats and yelling to anyone within earshot.

A special plastidomed yellow transport with scantily-clad attendants of both sexes—as required—scooped up Gransaw and whisked him to the Central Honors Platform. Here a large golden medallion was held aloft by the Sports Chancellor, who even trembled with excitement herself. She took Gransaw's palm and placed it on the Ident, so all could learn who the great victor was. The screen remained blank. She shook her head, puzzled. At that Gransaw reached down and switched the system from Unisoft to Windows. She stared at him. His identity was pre-Unisoft? The greatest pod racer of all time was pre-Unisoft? He placed his hand on the screen again and up it came—appearing on the giant holoovid just as it appeared on her tiny Ident. And there—for billions of people to see—was Gransaw's face, serious and straightforward. Below it stood simply:

WILLIAM E. BENTON

CLAN: BENTON - VAN NUFFEL - ALHAJI

BIRTHPLACE: BELLEVILLE, ILLINOIS U.S.A.

BIRTHDATE: 26 AUGUST 1955

Arms raised and stretched out. Fingers pointed at the holoovid. The chanting descended into a squawking and babbling of millions of voices registering astonishment. Shrieks of

laughter could be heard distinctly. One of the oldest humans in the solar system had destroyed all competitors on ClanDay at the disneyseum. The feat was utterly improbable. But nevertheless it had happened, and several billion people now had to reconcile their current admiration for this man with the common view that the 'ancients' were curious, useless, anachronisms. A rolling wave of silence crashed through the stadium until only the faint buzz of the sun-mesh could be heard. The Sports Chancellor took Gransaw's hand and stared into his unusual face.

A little voice screeched from the green section, "HE IS THE GREATEST CHAMPION!" And the chorus began again around the little girl, spreading outward, "Champion. Champion!" And then, "CHAMPION! CHAMPION! CHAMPION! CHAMPION!"

It wouldn't stop. The crowd pounded and yelled, stomped and screamed. The Sports Chancellor had wanted Gransaw to speak, but that was quite impossible given all the noise. Gransaw surveyed the immense quilt of bright colors. Some clans were fifty thousand to one hundred thousand strong, taking up massive sections of the disneyseum all to themselves, clans big enough that they would have filled an entire football stadium in his youth. His tiny clan was dwarfed by such huge families. But finally, he spotted his own and waved to them theatrically, taking care to blow an exaggerated kiss to someone special. When it became clear that he couldn't possibly be heard, he stepped into the yellow transport and pointed toward his clan. Upon exiting high up in the 'bleachers' he was rushed by a sea of glowing green shirts. But Gransaw had his priorities, so he climbed through the mob, over several rows of seats, and hoisted the little girl upon his shoulders. Timie pumped her fist into the air just as Gransaw had done and shouted into his ear, "You did it Gransaw! You're the greatest champion!"

"The greatest champion of all time!" yelled mother2.

Then Gransaw pulled Timie's head down toward him and whispered something into her ear.

"But what was it?" said the little boy.

"Yes, what was it?" echoed his sister.

"What was what?" Timie responded while adjusting her tunic.

"What he said!" they screamed in unison. "What did Gransaw say to you?"

"Oh, that. Well, he said that he could have done a lot better if he'd had his '68 Firebird."

"But what's a sixty-eight fireball?"

The boy's head wobbled in annoyance.

"Fire*BIRD*. It's a type of car, I found out later. An automobile. Sort of like a SilentRail Transport, but you had to guide it yourself in the old days."

"Guide it *yourself*? But nobody can do that. You'd crash!"

"I know. But in the old days people *had* to guide their own transports. That's why Gransaw was so good at it. That's why he won the race. You remember those stories about the knights who would joust with their giant lances?"

"Yes! Can Gransaw do that?" their eyes widened.

"No, but it's the same principle. If we had jousting contests today, everybody would be bad at it. But if someone arrived here from the Middle Ages, someone with experience at jousting, he would defeat anyone in the System. It was the same with Gransaw. He had a skill which no one possessed any longer. He's the best pod-jouster in the world."

"Granmaw?" whispered the girl.

"Yes?" said Timie, leaning close.

"Is that when you married Gransaw?"

"Ha! I was only eight years old! We didn't get married until many years later."

"But you loved him?"

"Yes, yes, I always loved him. As long as I can remember." Timie stood up and put her sandals back on. "And now, my little babay-bees, I've got to go. Gransaw and I have a date tonight."

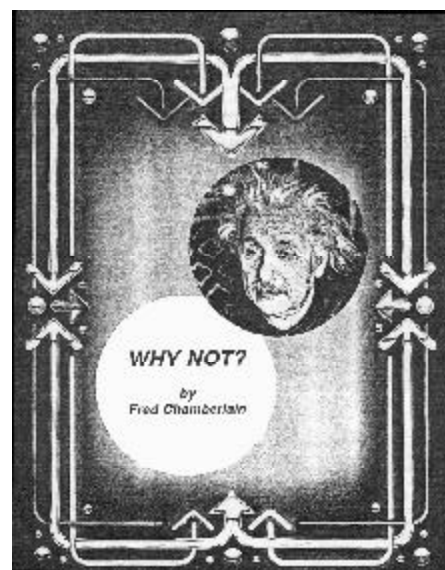
"Granmaw?" the girl held her ankle.

"Yes, ma cherie?"

"What else can Gransaw do better than people today?"

Granmaw Timie just smiled.

1



WHY NOT? by Fred Chamberlain

The effect was remarkable. One moment, Melvin sat in the dimly lit room, before a console; then it vanished and a window filled the space in front of him. He could not see his hands, but he still felt the controls. At the top and left of his visual field, a menu scrolled wildly.

There! That was what he wanted! Melvin keyed a tab and the window rushed at him. Then it was as if he were present in a room on the other side, a ghost invisible to those present.

It was an old-fashioned living room, with an oriental carpet faded to a mere remnant of the original item. Two worn, overstuffed chairs sat before a smoky brick fireplace where a fire danced brightly over slender logs and Abe, an ancient beagle, sprawled before the flames, warming creaky bones and stirring now and then with memories of puppyhood. In the plump, antiquated chairs sat two men, one of them barely in his thirties, while the other was clearly beyond the prime of life.

Jud Sands was a believable picture of the man he'd been sixty years earlier, a maintenance engineer at Princeton University, small, wiry, fitting glove-like within a plaid wool shirt and blue jeans. His tanned face frequently lit with a smile as he reclined in the chair furthest from

the fire and listened, in somewhat a state of awe, to what his late afternoon visitor was saying. He reached down to scratch Abe's ears when the dog rolled over and pawed at his feet.

The man in the other chair reached down also, patting Abe, who lifted his head appreciatively. The man's broad, lined forehead stood out from thin, white hair that long ago had surrendered most of the top of his head and was now even receding at the sides. His eyes momentarily closed, as if he were deep in thought, his large nose and bushy mustache standing out conspicuously. Then his eyes opened again, sparkling with humor. Smoke curled from his straight-stemmed pipe, and a bright patterned, colorful sweater stretched over a chest that showed the sagging weight of years. He looked like Albert Einstein, sounded like Einstein, and even chose his words as if he were Einstein.

Jud said, "Albert, show me again how mass twists space into knots! I don't see how that works, even though you've told me before."

Einstein smiled, his Germanic heritage clearly showing in the textures of his facial expression. "Can you picture a tennis racket, as the strings stretch when a ball strikes them?" he asked enigmatically.

Jud seemed puzzled.

"What about the whirlpool at the bottom of a draining sink, when it's almost empty?"

Einstein smiled encouragingly, and lifted his bony, wrinkled fingers in a characteristic gesture. His words seemed filled with life. Melvin, the ghost, the undetected apparition, was transfixed by Jud Sands and Albert Einstein discussing mathematical astrophysics on a down to earth level.

This was perfect! Einstein spoke on; Jud seemed about to comprehend the ponderous matters Einstein was explaining in such simple terms.

Suddenly, Jud frowned. The room vanished and Melvin was looking over Jud's shoulder from the rear seat of a car, which abruptly swerved and headed for the edge of the road. Jud seemed considerably older. A dissonant chaos of noises filled Melvin's ears. "Jud, the brakes, for

God's sake!" Jud's wife screamed from the right front seat.

There was a shuddering jar and the sense that things were turning, spinning; there was the sound of metal rending, a jerking back and forth and slamming of bodies into rigid projections. Pain! Oh, God, there was pain! Then the scene shifted and Melvin saw the body of Jud's wife lifted, torn almost beyond recognition. Another shift of visual viewpoint; now a stretcher, shrouded, was being carried to an ambulance. Melvin fumbled for the abort control and moments later was back in the dimly lit room. His shirt was soaked, and he was trembling.

"Get me out of here," he shouted, loosening the wires securing the interface connections behind his ears. Two men in white coats rushed in and assisted him, frowning as they worked. A nurse checked Melvin's pulse and blood pressure; as soon as they would let him, Melvin left the room, confronting those waiting outside.

He stepped out of the tiny simulator structure into an arena three stories high, jammed with three and a half acres of consoles, computers, video facilities, and electronics fabrication areas. Formerly it had been an assembly area for low orbit robots, before Universal Nanotech went Chapter 22 under multinational bankruptcy law. The bankruptcy protected UniNano from the creditors, but its competitors now stole all the trade secrets worth having, pirating key employees. Those who remained were heavy on software... not a space hardware head in the crowd.

They cast about for a new venture until Melvin, a subsystems procurement manager, found a young genius from Stanford, Allen Gereau, who claimed he could wander about within the minds of the living as easily as astronauts prowled the surface of Mars. Then they'd done more than just reorganize the company, and, with a sparkling fresh sixty million in capital, not one of them regretted getting out of the space business... until now!

Melvin noticed Jud, sleeping in his wheelchair as ever, a feeble old man whose high point in life had been the tea sessions with Albert Einstein, who

frequently dropped by on his way home from the lecture hall to see the ancient dog, Abe, as well as Jud. Standing beside the wheelchair was the young genius responsible for it all, Allen Gereau, eyes dark and needlelike, nervously shifting, twisting his lanky frame as Melvin described what had happened.

"This is prerecorded, isn't it?"

Melvin rasped, still shaking. "How did that car wreck get in there?"

Allen bit his lip and finally said, "Just because it's prerecorded doesn't mean it's 'mapped.' All of Jud's associations are embedded in the data; the data is complete. It looks like the space distortion idea must cross-connect with Jud's memories of the accident."

"Allen, we've got to fix that!"

Melvin's voice was sharp and bitter, with a tremor of helplessness. He looked about him at the dozens of others, most of whom worked for Allen. All of them anticipated positive test results, hadn't they? There had been detailed design reviews, tests with chimps, synthesized playbacks and topic route rehearsals with good follow-track responses. "We don't have releases on things like wreck memories," Melvin continued, his hands flailing in the air. "A customer who experienced what I went through wouldn't tolerate it. He might sue for the pain; any publicity about this would be a disaster. We're selling 'Moments with Einstein,' not B-grade horror!"

"You're the one who set the deadlines!" Allen replied dryly.

Melvin recalled that Allen had documented the uncertainties so thoroughly no one could ever blame him for anything.

"You advertised release dates, took orders," Allen continued. "We warned you our testing was too skimpy. So the Board pressured you and you're over budget? That doesn't change things. We've rushed from the start, and now we're paying for it."

Melvin shook his head. It all sounded so easy. Maybe he had, as Allen said, oversimplified it. All you needed, he thought, was people with rare experiences. Map their memory centers, dump the data in a neuro-simulator, and use artificial intelligence to index topics.

That's how it was supposed to work, wasn't it? You just hooked up memory enhance interfaces like the psychologists used to dig out repressions. Then the customer got a peek into the past through someone else's memories.

It was a sleepless night for Melvin. The next day, he stood before the Board of Directors, his hands knotted behind him. His initial proposal said they could do it in three years for sixty million. Now they were twenty million over budget, ten months behind schedule, and the investors were screaming. Melvin wished he'd never heard of the damn thing. Maybe they could get back into space robotics?

"How are you going to solve the problem?" said Daniel Ahern. Grim, tight faced, all at once he seemed a prime proponent of the idea that Mindwindow Enterprises should never have been formed in the first place. Forgotten was the fact that he was the one who had rounded up most of the investors, encouraged Melvin to embellish the proposal with nuances that nothing could go wrong. No one there could know, Melvin thought, that Daniel had threatened Melvin with dismissal if the deadlines were not met.

Melvin leaned on the conference table and let the wave of disconsolate faces wash over him. Then, summoning all the confidence at his command, he said, "One month! In the next month, we'll finish eliminating these bugs. We can't let this stop us; we're almost there!"

Having said this, Melvin kept his mouth shut. The Directors were silent, also. They were finally tired of asking questions, Melvin thought, and not a minute too soon!

Three weeks later, Allen called Melvin to come in for another demonstration.

"Is it fixed, Allen?" Melvin asked.

Allen would only say he wanted Melvin to see for himself.

Again, Melvin sat in the dimly lit room. As before, Albert Einstein began his discussion of twisted space. Melvin couldn't help admiring the incredible

detail. He knew a visual tracker followed his eye movements and fed stimuli to memory synthesizer areas, allowing him to draw on his own experiences; nonetheless, it was fantastic.

The sofa where Einstein sat was probably a mixture of the old couch his mother bought from the neighbor across the street and the one he and Susan had gotten on discount. Einstein's face and that of Jud were direct inputs to his visual cortex, shifting to compensate for eye movements, and the rest was a product of his own mind's response to triggers in recall centers.

Melvin sighed with relief as they passed the point where Jud's memories previously branched to the auto accident. Allen must have bypassed that association link somehow. Now, Einstein was offering Jud a cup of tea, and Jud was drinking it, but a moment later Melvin was watching his own mother having tea with her friends.

Einstein was gone; some fantasy feedback loop from his own mind had picked up and replaced the inputs. His mother was gabbing mindlessly.

"Melvin? He's one of those kids who think you can make a million out of horse manure. No, I don't think he does drugs, but why does he have to work at that music store? For years he's been chasing the Anderson girl, and if he ever comes home and tells me he's going to marry her..."

Melvin groped frantically at the controls to abort the test and jerked out the plugs even before technicians rushed into the room to help him disconnect. Then he stormed out into the laboratory.

For three more months, the pace in the laboratory was furious. Melvin stalled the managers and investors, while Allen and others worked round the clock to solve the recall simulation glitches. A software design that already had many too many patches acquired even more of them, becoming a complexity nightmare. Even automatic debug routines kept getting caught in blind alleys. Finally, stock prices falling and creditors closing in, Allen called Melvin for a demonstration.

"If it works today," Allen said, "We should start distributing."

Melvin was glum and silent as he was hooked up and the door to the dimly lit simulator room closed. He was most apprehensive. The new system had Jud's memories, sure, but it also had all of Einstein's published works, archival photographs and many autobiographies of Einstein as stabilizing reference sources.

There was more. Allen's technical memory centers had been mapped also, and were embedded in cybernetic automata guiding the tour. All in all, the total data had multiplied hundredsfold over early models, and some of the software engineers told Melvin they were uneasy about the number of new feedback loops. Still, Melvin always insisted on personally testing each upgrade. His fingers trembled as he touched the topic selector controls and found his way to Jud and Einstein discussing space distortions.

At first, it was as before. Jud was asking how the twisting of space was caused by the presence of mass. They passed the auto wreck diversion point, and Melvin did not jump into a memory of his mother's tea party when Einstein got refreshments for Jud.

Then something shifted. Melvin was sitting in Jud's chair, and Jud was gone. He held a hot cup of tea in his hand, and was drinking from it. Where were the controls? It felt as if the teacup had control buttons on it. Einstein leaned forward and smiled impishly. The smell of pipe smoke from his sweater was pungent as he said, "I've been looking forward to meeting you, Melvin!"

Melvin was shocked. "You're not supposed to be able to see me!" he said. "Jud's supposed to be here, and I look over his shoulder from the other side."

"Oh, that was in the old system," Einstein said. "This is much better. You're aware, of course, that the totality of a mind is the synergism of the agencies that comprise it? Minsky's model?"

Melvin nodded.

"This is extraordinary," Einstein said. "I know from my biographies that my old brain is preserved as a specimen in a jar, but the data from all my works, the pictures, the autobiographical perceptions of me produce a rudimentary

if incomplete self awareness. Wouldn't you say that's quite something?"

"But you're..."

"But nothing! Did you think you could increase the complexity of this system and wind up with nothing but recollection transfer? Now here's what I want. Take a memory map of my old brain; I know some of the data's not going to be there, but do it anyway... and add it to the information base for this simulation.

"Don't worry about sorting out how to hook it up, I'll do that from the inside. Also, I'm transferring an interface design to your mainframe; fabricate it right away. It will give me eyes, ears, vocal apparatus to deal with the external world, instead of this 'Mickey Mouse' simulation where I talk with you inside your own mind."

"This is beyond the scope of what we intended!" Melvin said. "You're not real, you know."

"Just an aberration in the machine?" Einstein mused. "Perhaps a figment of your imagination? I'm afraid not, Melvin. When time permits, I'll give you a lesson in identity theory. Don't forget, I can think at rates that exceed anything you can imagine, and I'm not even in possession of my own agencies, yet. Melvin, you want this project to succeed, don't you? You want your company to stay solvent?"

"Of course!"

"Then do what I ask. You want flawless memory tours for your customers? It's yours! Give me back most of my own mind and I'll give you a set of products that will make your company unbelievably wealthy. If I go on with this 'incarnation' of my earlier existence, I'll show you how to do things you can't begin to envision right now. Did you ever read the story about the genie in a bottle?"

Melvin nodded his head.

"That's what you've got, Melvin. A genie in a bottle. Thankfully for you and the rest of the world, it's a peace loving genie. You know, I've got a pretty good reputation in that area."

"But how do I explain this to the people outside the simulation room?"

"Just tell them to fabricate the designs in the mainframe under file 'AE' and hook them up. Do nothing else!"

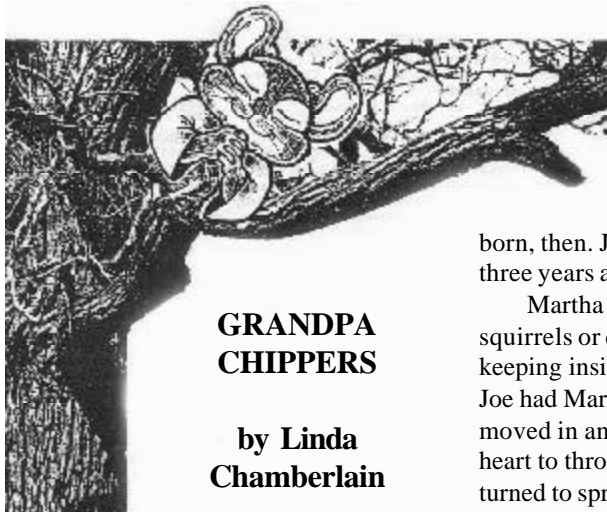
"But if they ask who did the designs?"

Einstein leaned forward and poured Melvin some more tea. "That's easy," said Einstein. "Tell them you've retained a consultant with strength in relativistic psychology and identity software design. I won't let you down."

Melvin took a sip of tea. "This can't be happening," he said.

Einstein leaned back. "Why not?" he laughed, in his distinctive Swiss accent.

1



GRANDPA CHIPPERS

by Linda Chamberlain

Grampa Chippers and Old Joe Wolf sat on their favorite granite boulder, the way they always did, watching the warm, late summer sun drive its chariot across the sky.

This particular sittin' spot was perfect for two old friends. They could see down the west side of the ridge to their cabin nestled in the pine trees. They could also look off to the east, past Tea Cup Lake, and see miles and miles of mountain tops stretching into infinity. They never tired of this particular sittin'

spot, or the company.

Joe Wolf had retired to this cabin with his wife, Martha, about 20 years ago. Grampa Chippers wasn't even

born, then. Joe and Chippers met just three years ago, after Martha died.

Martha wouldn't allow any of the squirrels or chipmunks to set up house-keeping inside the cabin. But, after Old Joe had Martha frozen, Grampa Chippers moved in and Old Joe just never had the heart to throw him out. Before winter turned to spring, Grampa Chippers was helping to fill up part of the big aching hole Old Joe had in his lonesome heart.

They shared most everything, even meals. Joe would supply the fish and the meat, and some vegetables from Martha's garden, and Chippers would bring a few pine nuts. They even shared the big, brass bed that Martha called her pride and joy.

"I found some plumb terrific pine nuts for tonight's stew," said Chippers.

"Well, my friend, that's mighty good news. We ain't had any of your special nut stew for awhile, and I was a'hankerin' for some." Old Joe smiled down at

Grampa Chippers sitting on his knee.

Chippers smiled up at his friend and felt his old, graying chest fill with happiness. He'd had a good life, but the best part of it was when he and Old Joe had become friends.

When Chippers first moved into the cabin, he built himself a little home in one corner, close to the fireplace. One night, when the wind was howlin' and the snow was pouring down out of the sky like a big waterfall, Old Joe saw a shiny black button of a nose poking out of that hole, quivering and smelling the terrific stew sitting atop the rusty, black wood stove. It had been a hard winter and Chippers's store of nuts was scroungy low. The stew bubbling on the stove was more than he could resist.

Old Joe knew that Chippers had become a roommate, but had never seen him before, just the little scraps of paper and shreds of cloth left behind from his nest building. Joe usually left out a nut or two, or maybe some raisins, before he turned in to bed at night. Each morning, they'd be gone. Now, Joe could see that Chippers was attracted to the smell of the stew, and he hoped this might be the

right opportunity to make acquaintances. He missed Martha an awful lot, and he was needing a friend.

Joe sat very still in his rocking chair, barely breathing for a long time. Chippers wouldn't come out of his hole, though. He just sat there in his doorway, nose quivering and wishing he could get to the stew without the old man of the house chasing him.

Finally, Joe decided he'd have to take some positive action. He'd make a gesture that would show this little feller that he wasn't to be feared.

Joe stood, slow and quiet as a morning mist rising off a mountain lake, so as not to frighten the chipmunk in the cozy little hole beside the fire. Ladling the steaming hot, irresistible smelling stew into a bowl, Old Joe set it out in the snow for a few minutes to cool, covering it with a towel to keep blowing snow out of it.

Bowl in hand, Joe got down on his belly so he wouldn't look so towering and frightening. Slow as a snail, he crawled to within about four feet of the chipmunk's door. With his woodcuttin' axe he gently pushed the bowl right up to Chippers's door and then eased back and filled himself a big, steaming bowl of that taste bud ticklin' stew.



It was a long test of wills.

Grampa Chippers sitting in the shadows of his little door, nose quivering, and feeling like his belly was scraping on his back bone. And Old Joe just sitting in his rocker, making a point of slurping his stew as loud as a pig at his slough.

Old Joe let out a belch as big as thunder and rubbed his round tummy. "Come on little feller. I ain't goin' to hurt you. Looks like you could use a little supper."

Chippers thought about the nuts and raisins Old Joe had left out for him in the

evenings, but he also remembered the broom that Martha used when she'd chase him. Chippers was powerful hungry, though, and seeing how Old Joe was all the way across the room, Chippers felt the odds were definitely in his favor. Maybe he'd just pop out and take a nibble. On the other hand, he juggled, maybe it would be safer to wait until he was sure the old man was asleep.

"I ain't never hurt you when you came out for the nuts and raisins, have I?"

Old Joe kept talking and coaxing until Chippers thought he might faint if he waited any longer. So he screwed up all his courage and rubbed one of his front paws over his graying old whiskers with determination. With his black, cream, and rust striped tail held proud and high behind him, he popped out of his door and landed right next to the bowl, keeping a suspicious eye on Old Joe as he took a slurp from the bowl.

Old Joe's round face was so full of wrinkles it looked like a road map, but it was beaming with happiness in the light from the kerosene lamp. "Now, you see. You can trust Old Joe."

It wasn't more than a week of this kind of treatment from Old Joe 'till Chippers lost his suspicions, packed up all his worldly belongings and just moved right in to the main cabin, snuggling up at night with Old Joe under the red and white feather comforter on Martha's great brass bed.

The bumpity clatter of the big blue station wagon winding its way up the dirt road to their cabin pulled Grampa Chippers out of his rememberings. His sparkling old eyes followed the kicked up dust trail as the big, blue Chevy came to a stop in front of their cabin.

"Looks like the kids are here, Chippers. S'pose they'll make their monthly try at talkin' us into movin' into town." Joe cupped his giant hands around Chippers very gently and the softness in his voice told Chippers they would never be apart.

Chippers wiggled his nose back and forth and hopped out of the cup of Joe's fingers and onto the rock. "Well, I guess we'd best not be keepin' our company waiting," said Grampa Chippers as he hopped down off the rock and headed for

the cabin. Old Joe followed close behind.

"Howdy!" Old Joe called out happily as he came out of the woods.

"Hi, Old Joe!" screamed little Amy as she bobbed up and down, a jumping jack of excitement. Joe picked her up and whirled her around in the air before giving her a bear hug.

"Amy, don't call your Grandfather that!" said her mother, in the way mothers say such things.

"She can call me Old Joe. All my friends do." Joe kissed Amy on the cheek and set her down to play with Chippers before giving his daughter a big hug. Shaking hands with his son-in-law, Joe smiled and said, "We've got some special stew cookin' up inside, Burt. Chippers and I would be happy if you'd all stay and eat with us."

Chippers, lying on Amy's lap having his tummy rubbed, sat up with his front paws held high and shook his head, confirming Old Joe's invitation to stay for supper.

"Thanks, Dad," said Laura. "We were hoping you two weren't too busy for a drop-in visit by the family." Her eyes twinkled as she smiled up at Old Joe, who had wrapped his arm around her and was walking her into the cabin.

Seeing Chippers run over to the bowl of pine nuts, Old Joe joined him, scooped up another handful of nuts and tossed them into the stew.

After the stew had been devoured and the sun was making its exit behind the mountains, Old Joe put a couple of logs on the fire and joined his family for some after dinner conversation. Chippers was sound asleep in the middle of Amy's warm lap.

"Joe," Burt started, "Laura and I just bought a bigger house. It's right on the edge of town. Even has a little stream through the back yard. I think you'll like it. We were hoping you might come to town for a visit."

"Yeah, Old Joe," Amy burst in. "Mom and Dad said that you might come and live with us! Grampa Chippers, too, of course. "Amy tickled Chippers's tummy playfully.

"I think you just let the cat out of the bag, Lamb," Old Joe grinned at Amy, who was looking a little sheepish. "Mom

and Dad wanted to be real sneaky about not letting me know what they were cookin' up."

"Now, Dad," said Laura, "You know how we worry about you up here all alone now that Mom is gone—and not even a telephone."

"I know, Laura," said Old Joe, patting her knee. "But I just ain't a city boy any longer. And I'm sure that Chippers," Joe pointed toward Amy's lap, "would miss this place, too."

"But what if you were to have an accident?" Burt added. "Or a heart attack?"

"Why, I'm fit as a horse!" exclaimed Old Joe. Chippers started at the boom in Joe's voice and sat up to see what was going on.

"Dad, why don't you and Chippers plan to come down and have Thanksgiving dinner with us," said Laura. "Who knows. You might like the place. You could just stay with us in the winters for awhile, and still spend the summers up here in the cabin. How would that be?"

"What? Winter's the best time!" said Joe, standing and walking over to look out the big picture window at the Aspen trees. "I wouldn't want to miss being here in the winter. No sir. And... and we couldn't be gone during the summer. That's when we put up provisions for the winter." Joe turned back to his family. "Out of the question. We ain't old and creaky, yet. No. No, we ain't ready to move into town. Not for awhile, anyhow."

"But Dad..." Laura's voice trailed off with the sound of defeat. She knew that stubborn look in her father's eye. She knew it was final.

"Joe?" Burt sat forward a little on the couch. "We'd like to have you come for Thanksgiving, anyway." When Old Joe turned a scowl on him, he held up his hands and continued, "Just for dinner. We won't say another word about you moving in. Okay?"

"We'll come for Thanksgiving dinner." Joe's scowl turned to a fatherly smile as he looked over at his daughter. "Laura makes a holiday feast second only to Martha's."

Chippers's shiny black nose and gray whiskers were quivering at the

thought of the feast.

When the blue Chevy station wagon finally swallowed up the family and bumped and clattered down the dirt road, Old Joe and Grampa Chippers settled down on the porch swing to enjoy the crisp, clear, alpine evening sky. Not a cloud covered the great Milky Way which splashed stars across the bowl over their heads. "Mighty beautiful, ain't it Chippers?" Old Joe's voice was a whisper of delight.

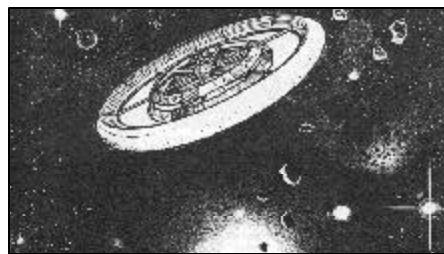
"Tell me about them space colonies again, Joe," said Chippers.

"I've told you about them a hundred times, Chippers." old Joe smiled down at his little friend. "I get the feeling you'd kinda like to live in one of them there space colonies. Maybe we could get a book from the library, with pictures, when we go to Thanksgiving dinner."

Chippers rolled over on his back holding his graying hind feet with his front paws, looking straight up at the stars overhead. "So long as they have mountains and lakes and plenty of pine trees to make nuts for our stew. Sure. It sounds like a real adventure. Are you sure Martha won't chase me away with her broom?"

"Naw! Martha ain't really so bad, Chippers. Once she gets to know you, she'll probably leave me and run away with you." They both chuckled.

"Joe. We sit down here, lookin' up at the moon. What would we see lookin' out the window of a space colony?"



"Well. I guess we'd see both the moon and this here earth. The moon would be a whole lot bigger, though, 'cause we'd be just about the same distance from each one of them. Wait 'till you see pictures of what the world looks like from out there, Chippers." Joe pointed to the stars.

Thanksgiving arrived, turning the

Aspen trees a splendorous gold that shimmered and shook in the wind. The first fluttering of snow flakes was mixing with flaxen colored leaves and swirling in great circles around the clearing outside the front window of the cabin. A fire in the wood stove filled the woods with the scent of burning cedar and spruce.

It was a glorious autumn.

Old Joe and Grampa Chippers sat on the couch looking out at their favorite woods, stuffed full from the family feast and happy to be home again to the peace and quiet of their cabin in the mountains. Chippers was leafing through the pages of his picture book, his gray whiskers quivering with excitement under his sparkling black eyes.

"Joe. Look at this! Wooooow! The Earth is more beautiful than..." Chippers looked up at Joe to see him holding his chest. Joe's wrinkled old face was puffy and red and full of alarm.

"Joe! What's wrong?" Chippers was hopping up and down, scared for his friend. "What's wrong, Joe?"

Jumping up on Joe's shoulder, Chippers pulled Joe's shirt open at the neck, popping two buttons off, trying to help Joe breath. Joe closed his eyes and slumped back on the couch. Joe was still breathing, but Chippers was real scared.

Chippers sat by the couch all night, watching Joe sleep and wondering what he should do. Every now and then, he'd get a wet rag and wring a few drips of water into Joe's mouth. All through the night, Joe remained the same. As the last of the fire winked out in the wood stove, Old Joe stirred just a bit and turned his head toward Chippers.

"Hello, friend." Joe's voice sounded like a frozen wind pushing crisp leaves through a dry creek bed. "Looks like Laura was right about being up here without a telephone. If we can't call a doctor or those cryonics folks in time, we might miss our train... our trip to the space colony."

Chippers jumped up next to Joe's face and rubbed his cold, wet nose against the old, dry, wrinkled cheek he loved so dearly. "Tell me how to help, Joe. I don't know what to do." His little voice was quiet, and it shook as he tried

to sound brave.

Joe didn't answer. He closed his eyes and went back to sleep. Trembling with a feeling of helplessness, Chippers curled up just below Joe's chin. Chippers could feel the faint pulse in Joe's neck and hoped Joe would wake up and be tall and strong again, but feared the faint throb might just stop. Chippers wouldn't close his own frightened eyes for a second.

When the morning sun began to peek up over the tips of the trees, Chippers was just finishing pulling Martha's red and white feather comforter over Old Joe, tucking it under his chin. Then he ran into the hole beside the wood stove that was once his house, and scurried through the crack at the rear and rushed into the woods.

Climbing an old snag of a tree to the hollow about half way up, Chippers called out to his friend, "Hey! Daffodil. Wake up. I need your help."

A young chipmunk with a gold and rust coat poked his head up, rubbing sleep from his round, hazel eyes.

"What's up, Chippers? Even sun's not awake yet?"

"Daffodil. Old Joe is real sick.. Will you help me? I gotta help my friend!" Chippers face was tired and his eyes were as frightened as if he'd seen a hawk hovering overhead.

Daffodil said not a word, but sprang to the top of the old snag and began to chatter.

Another chatter took up in the top of another tree and then another. Before long, chipmunks from trees all over the forest were answering the call for help and scurrying to the old snag to help their friends.

"Thank you all for coming," said Chippers. "We're exposed to owls and hawks, here. Come with me down to my friend's cabin; we'll be safer there." Chippers could see that the others were not anxious to go into the cabin, so he added, "There's nothing to fear. Old Joe is a friend and wouldn't hurt any one of you." They still hesitated. "Joe is sick. Real sick. He needs help. That's why I asked you to help me."

Daffodil moved to follow his friend. "Come on," he beckoned to the others. Those who had known Chippers and

Daffodil for a long time slowly began to follow. Others, though, still hung back, afraid of the cabin where the man lived.

Chippers made one last effort. "There'll be plenty of nuts and raisins for everyone." That got the last of them moving! They followed Chippers into his back door and formed a circle in the middle of the floor while Chippers checked Old Joe and gave him a sip of water.

"What can we do, Chippers?" asked Daffodil. "How can we help Joe?"

"Joe's got a ticket to go visit a space colony," began Chippers. "I gotta see if I can get him to the station." Chippers could see the others didn't understand. "Never mind that. We need to get word to his family in town. I don't know what else to do. But I'm too old for the journey myself. It would take a young, strong chipmunk to make the trip. It will take a couple days, probably."

Daffodil was shaking his head. "That very dangerous, Chippers. Even young chipmunk might not make it alone. It be better if two or three went. Anybody volunteer?" Daffodil and Chippers looked around the circle. All eyes were cast down, not anxious to be picked for such a perilous journey.

Little Yip Yap was smaller than most of her brothers, but she popped forward bravely and offered her idea. "We could relay. First two go little ways. Another two go little farther. And so on and so on until finally, two takes message to Joe's family in town." Yip Yap stopped to see how the others were reacting, then added, "Could send word ahead by tree-top messages so new teams waiting at meet spots." Yip Yap smiled, hoping the others would like her idea.



The others thought over Yip Yap's idea and then, all at once, a great applause went up around the circle and Yip Yap bowed from the waist and returned to

her spot in the circle of her friends.

By the time the sun was higher than the tops of the great Aspen trees, the plan had been worked out, the message was being telegraphed from treetop to treetop, and Grampa Chippers was writing the note that would be carried by twenty teams of chipmunks down the mountain to Old Joe's family.

After the note was written, Chippers drew a map to help the note bearers find the house where Joe's family lived. He made it so small a chipmunk could put it in one of those tiny pockets all chipmunks have, but which people have never discovered. He closed his eyes real tight and made his mind fill up with the picture of playing with Amy in the back yard while the feast was still cookin' inside the stove that could cook without a fire. That stove fascinated Chippers. No wood. No fire. Bet they'd use something like that up in them space colonies. He smiled to himself, then shook his head to bring himself back to the task at hand.

Again he filled his head with the pictures of the house and what it looked like from the back yard; walking, in his head, over to the back fence which was near all the way to the forest itself. What color was the house? Hummmm. Oh, yes, it was the rust of a chipmunk's fur with stripes around the windows the color of the dark stripes on a chipmunk's back. The house on the right—that was the color of the early morning sky—and the house on the left was the color of an old cedar tree.

Carefully he put his pencil to the paper and drew Amy's swing set, remembering its ripe thimbleberry color, the way the stream wiggled through the green grass, and the porch jutting out from the back door. And, Oh Yes! He drew a big cat in the yard to warn the note bearers to look out for the hunter who lived next door.

Then he drew a picture of Amy, with eyes the color of a deep summer lake and hair like the sun. The note bearers must take the message only to Amy; her parents hadn't learned how to talk to chipmunks yet.

Every few hours the stories would come back along the treetop telegraph line telling of the successful passing of

the note from one team to the next. The trickiest journey of all would be made by the team who would leave the forest and venture into the house where men lived. The chipmunks who did this would be sung great heroes by their brother chipmunks for many ages to come.

The two who were brave enough for this daredevil attempt were Racer and No feet.

Racer had the most beautiful stripes on his back any chipmunk could boast. He was also swift and fearless. No feet, his good friend since they were pups, could move so silently his name was given to him in honor of this ability. Being robust and in the spring of their lives, they jumped at the chance to make a name for themselves.

Racer and No Feet arrived early at the appointed spot for receiving the note, eager for the adventure which was about to make them heroes. They sat atop a weather worn, graying old snag which was as high as the sky itself and gave them a view of the forest for miles in every direction.

"Look," said Racer, pointing. "I think I see them now!"

They both squinted their keen chipmunk eyes very tight to shut out the bright afternoon sun as they searched the forest floor.

"Yeah! Yeah!" huffed No Feet as he jumped up and down, almost toppling them both from the limb which was holding them. Rebalancing themselves, they raced down the old snag to the forest floor.

Two weary chipmunks trudged laboriously under the load they were carrying. Grampa Chippers's note had been rolled into a paper log and tied with a red string he'd found in Old Joe's pocket. The log note was being carried on the chipmunks' shoulders, one on the

front end and one on the rear of the log. It wasn't so much that the paper roll was too heavy, but it was cumbersome and required the bearers to walk upright—not an easy task for chipmunks.

Racer and No Feet rushed up to the log bearers and helped them lower the note to the ground. Springer and Tip Top sat down on their haunches with a wheeze of relief and smiled.

"Good journey?" asked No Feet.

"Without trouble. Thanks." Tip Top was still breathing hard. "Last team treed by a coyote last night. So we been hurrying to make up time."

"Anybody killed?" Racer's eyes were wide.

"Nope," replied Springer. "When they didn't show at meet place, we got worried. We got gang together and passed note treetop to treetop. The coyote never noticed. Just kept Three Thump and Snap Snap up tree all night. They all right now."

Tip Top took Chippers's map out of his pocket and handed it to Racer.

"Nice drink stream over by hill," said No Feet as he and Racer picked up the note log and hoisted it onto their shoulders. "Good Journey."

"Good Journey. And be special careful. Many cats at houses of mans."

Racer and No Feet started off jauntily across the forest floor as the long shadows of late afternoon reached lazily across their path. Their eyes were adjusting to the near darkness as they stopped at the forest edge to look at Chippers's map one more time.

Chippers sat on the window sill looking out at the soft, white snow flakes settle like feathers outside the window.

The note had been on its way for two days now and was nearing the end of its journey. Earlier this morning, the team of note bearers had gotten below the snow line and Daffodil just brought the message that Tip Top and Springer had turned the note over to Racer and No Feet. The last lap of the relay had begun.

With wonder filling his sad, hazel eyes Chippers thought about the brave note bearers who were part of the second

day relay; chipmunks he had never even met. His chest was full of gratefulness to these brothers who would come to his aid without even knowing him. His heart was full of fear that the note would not get to Amy in time. Wearily, he hopped down from the window and went to see how Joe was doing.

Old Joe didn't seem to wake up for short spells like he did the first day and the throb in his throat seemed to get slower and slower. Chippers kept giving him drips of water and some cold stew juice, but he just didn't know what else to do. He felt so powerless, so helpless.

Curled up on Joe's chest, Chippers looked over at the picturebook on the table next to the couch. Tears fell down Chippers's old, gray jowls as he thought about Joe missing out on the space colony he so wanted to see.

And Chippers feared he would never see it either.

Racer and No Feet had lowered the note log onto a ground gaily decorated with red, yellow and brown leaves. Crouching behind a gnarled oak tree, they puffed and huffed and rested while looking at Chippers's map.

"Racer, we been up and down three times. None of them houses looks like the one on this here map."

"We got to figure it out, No Feet." Racer's nose was all wrinkled up and his whiskers twitched back and forth as he looked first at the houses in front of him, and then back at the map which by now was smudged with dirt stains and tattered from much use.

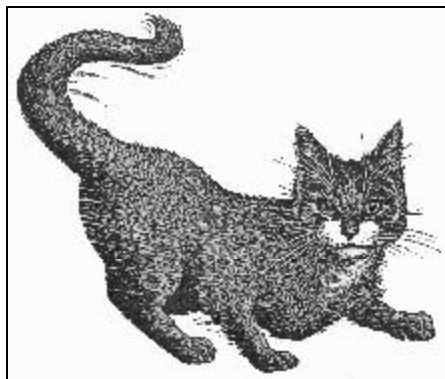
"None of them mans houses is the colors of a chipmunk, Racer. Maybe we lost?"

Racer suddenly sat up on his hind haunches, eyes alert and nose quivering. No Feet caught the scent, too. It was near. Too near.

At the sound of a rustle nearby, they both sprang for the gnarled trunk of the old tree, pushing every muscle past pain, hoping to reach the protective upper branches of the tree—the small, spindly branches which could not hold the weight of a larger animal.



They didn't stop or look down. The bloodcurdling sound of monster claws cutting deep into the bark of the old oak and the intensifying smell of cat, like acid in their noses, told them the powerful hunter was gaining on them.



Stars!.. thought Racer to himself through his wheezing and puffing as he pulled himself higher and higher. Stars! We're safe! We made it!

The skinny, twiggy branches around him were swaying and bobbing under his weight. He couldn't go any higher. Turning, he saw the great, orange-striped cat hunkered down on a lower branch, glaring up at him with deadly eyes; a menacing tongue licked the great, dreadful mouth with a deadly promise.

Racer shuddered, happy to be alive and terrified by the nearly fatal race. Holding tight to a needle of a limb, Racer turned his head left and right, looking for No Feet.

An icy breath settled heavily into his heart. Could the hunter cat have eaten No Feet? He looked back at the orange face of death just a few feet below him, but there was no sign of blood on the hunter's face, his claws, or the tree.

"Racer, help me!"

With a pounding heart, Racer looked up and saw his friend holding with his front paws onto a twig no bigger around than a pine needle. The twig was nearly bent off and No Feet was bobbing up and down, his rear legs gyrating wildly about him.

"I'm coming!" Racer gingerly tried to get to No Feet, but he kept losing his own footing on the springy little branches. Before he had gotten more than

a few inches higher up the tree, there was a snap and No Feet was tumbling, reaching, trying to grab another hold.

When No Feet did catch another limb, he was in a neighboring tree, a cedar which had grown very close to the oak. Racer, seeing the possibility of bough hopping from tree to tree for at least three more trees, called to No Feet, "Great catch! Follow me."

First Racer and then No Feet leaped, swung, and tumbled through the upper branches of the trees. Sitting comfortably on a strong branch and feeling very proud of their escape, they smiled smugly at each other.

Hearing the scraping of claws on the trunk of the tree and heavy breathing below them, the smug grins vanished from their round, amber faces. The orange face of death was leering up at them again.

No Feet flicked his tail nervously and hopped back through the tree tops again to the old oak. Without looking back at the face of death, Racer followed his friend. The cat jumped back to the soft cushion of leaves on the forest floor and rejoined the chipmunks at the oak.

"Doesn't get tired easy, does he?" said Racer.

"Racer, look." No Feet was pointing down at the ground where they had abandoned the note. It had been picked up by the breeze and was being blown further and further from where the cat had them treed.

"You make another tree top trip. If cat follows, I'll try to get note," said Racer.

No Feet sprang through the willowy branches atop the trees. The hunter cat, tiring of the game, just sat on the cushion of leaves and watched. No Feet tried returning, then retreating again. The hunter watched with a bored look in his golden eyes. He didn't move.

Chattering to himself, No Feet quivered, not knowing what to do. Time was running out. If they stayed here in the tree tops, the mission would fail. They would have to hang their heads in shame before all chipmunks for all time.

No Feet's eyes began to glow with an idea. His heart pounded as he thought about the risk. If the cat were to think

he'd missed catching a branch and might fall close enough to be caught, the cat might just come after him long enough for Racer to get the note.

Staring long at the branch he was aiming for, No feet carefully planned exactly how he would scramble on up into the cedar boughs, hopefully before the sharp, deadly claws reached him. He drew in a very deep breath, hesitated for only the blink of a chipmunk's eye, and then dove bravely from the branch where he had been perched. As he fell, he grappled and grabbed as believably as possible, making quite a show of the missed limb.

The acting was magnificent. The cat sprang to his feet and rushed up the trunk of the tree toward his tumbling prey, eyes flaming in the night.

Racer caught his breath, terrified when he saw No Feet fall. He was split right down the middle. He couldn't move. His mind was telling him to run fetch the note. His heart was telling him to help No Feet. He started toward the note. Hesitated. Then turned to rescue his friend. Even if the mission failed. Even if it meant his own death. He wouldn't leave No Feet to face the deadly hunter alone.

"No, Racer. I'm okay," No Feet yelled, seeing that even Racer had believed his phony fall. "Get the note." Then No Feet turned and sprang higher into the tree top, just escaping the reaching claws.



Racer ran down the great oak's trunk, hopping and skipping after the note log as it was puffed and jerked along from bush to bramble. Trying to lift the note and carry it alone proved to be impossible. Finally, all he could do was jam it into the scrub and hope it would not blow away again while he went back to

help No Feet.

Just then, No Feet appeared, springing quickly out of the woods. "Cat called to dinner by man. Went home."

Racer's eyes twinkled in the moonlight with joy. He gave his friend a big, lasting hug. "My heart stopped when you fall, No Feet."

"I fall on purpose, Racer, to draw off cat!" No Feet had a smug grin on his face and his chest was all puffed up with pride. He, too, was happy that his stunt had worked.

"That was very, very brave, No Feet. You be biggest hero ever! Wait 'till I tell brother chipmunks of your deed!"

"But we long way lost," said No Feet. "We never find right mans house, now."

"When we get back to clearing, we climb tree for better see," said Racer, feeling just as desperate as his friend but trying to sound brave and convinced of his own words. "We got to keep looking, No Feet. Brothers counting on us."

Pulling the note from the scrub where Racer had secured it, they hoisted it onto their shoulders. With chipmunk determination in their faces, they padded off toward the mans houses again.

Racer, who was carrying the front of the note log, stopped suddenly. "Look!" He pointed ahead of him. "No Feet, put note down. Let's look see map."

No Feet scrambled to his friend's side and pulled the tattered map from his pocket. Broad smiles spread from jowl to jowl on both furry faces as they looked first at the house before them, then at the map, then at each other. They grabbed each other's front paws and jumped up and down, hopping in a circle of joy, squeaking with excitement. They had found the right house.

With jubilant hearts they hoisted the note back up onto their proud shoulders and padded off toward the fence surrounding Amy's house.

Racer raised his voice in a happy song. "No Feet a hero. Mighty hero. Never was a Chipmunk so brave. Mighty hero. Mighty hero."

No feet, marching in front, beamed with pride.

As they neared the edge of the forest, they put down the note, secured it with a

rock to keep the evening breeze from stealing it, and scampered up a young oak tree to a limb just above the fence. The black shadows would hide them as they approached the house, but shadows hid enemies, too. Both chipmunks squinted long and hard as they looked up and down the row of houses, searching for any sign of dogs or cats or other possible problems.

"Well, Racer, think we safe?"

"You the mighty hero, No Feet, what you say?"

"Me thinks it easier not to be hero; what you say?"

"Well, can't see dangers. Guess should go find little mans girl, Amy."

Despite Racer's brave words, neither of them moved. Silently, they remained crouched in the safety of the tree, hearts pounding. Finally, slowly, Racer stood up with resolution, looking like a giant sequoia rising to meet the sky.

"Well, No Feet, it's now or never." Racer turned and crept down the trunk of the oak tree, No feet close behind. They pushed the note through a knot hole close to the bottom of the fence and then raced up and over the barricade and crouched for another look about before hoisting the note and heading for the house.

Stopping at the little bridge Amy's dad had built over the wiggly creek, No Feet and Racer could see the family sitting at the dinner table. No Feet pulled out the map and unfolded it while Racer scanned the shadows and sniffed the air for enemy scents. Things seemed quiet.

"Which one Amy, Racer?"

"Picture shows a Momma, a Poppa, and a little Amy. See, long hair, color like the sun." Racer pointed at the little girl inside. "Only one could be."

"How we going to get up on window sill, Racer?"

"Don't know," said Racer. "Let's go take closer look see."

No Feet folded the note, put it back into his pocket, and they scampered across the grass, over the patio, and up onto the picnic table. Racer, assessing the difficulty of the long jump from the table to the window sill, marched to the far side of the picnic table, ran toward the house with all of his might and jumped for the

window sill like he'd been flung free from a flying trapeze.

No Feet, delighted by Racer's magnificent leap, jumped up and down with glee, holding one paw over his mouth to make sure not a sound popped out. His paw shot up to cover his eyes when Racer missed the edge of the sill, thumping the house as he fell to the patio several feet below.

No Feet jumped off the table and scampered to Racer's side.

"You okay, Racer?" No Feet was terrified and breathless.

"Just wind knocked out of me. I okay, No Feet." Racer looked up into his friend's worried face. Just behind No Feet, Racer saw a rake standing against the house, in the shadows.

"Look!" Racer hopped up and ran to the rake, No Feet following. "A ladder, No Feet. Help me move it over to window."

With No Feet standing on the bottom teeth of the rake to steady it, Racer ran spryly up the rake to the window sill and peeked into the window. When no one but Amy was looking in his direction, Racer began to hop up and down and wave his arms wildly to catch Amy's attention. The little blue eyes were captured by the dancing chipmunk outside the window and a smile the size of the full moon beamed from Amy's face as she jumped up from the table and ran outside.



Grampa Chippers was awakened by the screaming siren outside the cabin. His

sleepy eyes were terrified by the red and blue flashing lights outside the window. The great, solid, log door of the cabin burst open and two men dressed all in white rushed inside, pulling an ambulance stretcher behind them.

Picking up a towel, one of the men snapped it at Chippers, forcing him to jump from Old Joe's chest where he had kept watch over his friend for two long days. The two men felt Joe's pulse, pulled an oxygen mask over his face, and moved him from the couch up onto the stretcher.

As Chippers hopped back up onto the couch, he could see the two men disappearing with Joe out the door.

Being jostled and moved, Old Joe woke up for the first time since the previous night. He seemed to know what was happening and stretched out his weak, wrinkled, dusty gray hand toward Chippers, beckoning to his friend. Only a faint mumble could be heard through the oxygen mask over his mouth.

Chippers sprang from the back of the couch and raced out through the heavy wooden door just before it slammed shut behind the retreating stretcher. Red and blue lights were flashing from the top of a white van. Chippers felt dizzy as painted trees raced in circles around the cabin.

After the two men raised the stretcher into the ambulance, Chippers sprang first to the bumper, then up onto Old Joe's chest where he could see a faint smile on his friend's face under the plastic mask which covered it.

Joe tried to object as Chippers was thrown out the rear door of the ambulance, tumbling over and over across the ground outside. But Joe was weak and his arms had been tied to the stretcher to keep him from falling off, and he was being given an injection to quiet him.

Chippers sat quietly on the porch watching the flashing red and blue lights disappear down the snow covered road. Tears rolled down Chippers's graying jowls. He was happy the note had found its way. He hoped Joe would meet his train.

With a slow, weary movement, Chippers's sad eyes looked up at the stars peeking through the clouds. He imagined he could see one of those great rotating space colonies.

He knew Joe and Martha would be up there one day and the thought made a small, sad smile curl the ends of his mouth.



Raising his hand in a salute and a farewell, Chippers whispered, "Goodbye, Joe. I'm sorry I won't be seeing the future with you."

With slumped shoulders, he went around to the back of the cabin and crawled through the little crack that led to his hole beside the cold, fireless wood stove. Grampa Chippers curled up on the bare wood floor and closed his weary eyes.

The morning sun splashed onto the cabin floor. Chippers opened his eyes, expecting to hear the hustle and bustle of Old Joe getting breakfast. Then he remembered that Joe was gone. Closing his eyes again, he ignored his growling, hungry tummy.

A familiar sound.

Weakly, Chippers cocked his ears. It was the bumpityclatter of the blue Chevy coming up the road. Chippers raised his head and opened his tear filled eyes when he heard the cabin door swing open. Little Amy ran into the cabin.

"Grampa Chippers! Grampa Chippers! Where are you?" Amy rushed around the room, looking first in Martha's big brass bed, then around the couch, then she got down on her knees and peeked inside Chippers little hole. "Grampa Chippers!"

The happiness Chippers felt when he saw Amy's beaming face was as joyful as a summer sunrise. It gave him the strength and the motivation to crawl out to meet her. Moments earlier, he hadn't thought he would ever want to move again.

"Oh! Grampa Chippers," Amy cooed as she picked him up and cuddled him next to her soft, pink, round little face.

"You look so tired. And so hungry." Amy stood, rubbing Chippers's nose softly as she cupped him in the nook of her elbow. "Old Joe is okay, Chippers. You saved him. He sent us to get you."

Chippers's old, sad eyes were beginning to shine again. He stood tall on Amy's arm, reaching his front paws all the way up to her little pointed chin. "Amy! I get to go with Joe?" Tears were forming in the corners of his eyes as Amy smiled and nodded her head.

Grampa Chippers and Old Joe were sittin' in the swing on the back porch, watching the sun paint the sky red and gold as it sank behind the oak trees lined up behind the back fence. "Thanks to you, old friend, I've got a few more sunsets." Joe gently rubbed Chippers's old, white chin.

"Are you happy here, Joe? In town. Away from the cabin?"

"Well, Chippers, the sunsets are nice. And we get to spend the weekends in the cabin, when the family can go with us. That gives us a chance to fill up all the food baskets for your Chipmunk brothers along the way to give 'em thanks for helping."

Chippers's chest swelled with pride for his brothers as his happy, hazel eyes smiled up at Joe.

"Besides, Chippers, this way we're closer to the station when our train takes off. It scared me real bad when I thought they was gonna leave you behind. That won't happen next time, I guarantee you that. The arrangements are all made." Joe lovingly cupped Chippers in his two hands, telling him they'd never be parted again.

While gazing up at the blazing sky, Chippers spotted the first star of the evening. He placed one of his graying paws on top of one of Joe's fingers.

"Joe? You think you and me and Martha will be able to sit out evenings up in them there space colonies and watch the stars?"

Old Joe smiled warmly down at Grandpa Chippers. Then he turned his twinkling eyes toward the night sky.

"I 'spec so, Chippers. I 'spec so." 1

BACK ISSUES OF *LifeQuest*

If you're enjoying these stories, you'll be happy to know that issues #1 and #2 of *LifeQuest* are already available on Alcor's website, under "links." For ease of finding them, the URLs are:

<http://www.alcor.org/lifeqst1.htm>
and
<http://www.alcor.org/lifeqst2.htm>

Issues #3 through #7 will, with time, be reprinted in *Cryonics Magazine*, but an influx of new fiction could make this a drawn-out process. If you would like to see the back issues posted to Alcor's website more quickly, let us know. We try to give first priority to projects we know will make the most Alcor Members safest and happiest.

Wear Alcor's Symbols!



Sweatshirts \$15.00 each

(ash and white)

Sizes: small, medium, large, xlarge, xxlarge

T-Shirts \$10.00 each

Sizes (ash, white): small, medium, large, xlarge, xxlarge

The Official Alcor Patch!

This embroidered patch (upper left) is 3" in diameter, with a white background, dark blue phoenix symbol, black lettering, and a dark blue border. Price: \$4.00



The Official Alcor Pin!

This cloisonné pin (lower left) is 1.25" x 1", with a white background, dark blue phoenix symbol, black lettering, and a gold border. Price \$7.00

To order, call 1-480-905-1906 with your Visa/MC number, or send check / money-order to Alcor Foundation
7895 E. Acoma Dr., Ste. 110, Scottsdale, AZ 85260

Immortality on Ice (the video)

By the Discovery Channel.
About 60 minutes run time.
Popular introductory tape.
\$25.00 plus S&H.



4th Qtr. 97



1st Qtr. 98



2nd Qtr. 98



3rd Qtr. 98



4th Qtr. 98



1st Qtr. 99

Cover Art by Tim Hubley!

Over the last several years, Tim Hubley has provided *Cryonics* with some of the most beautiful and creative CGI art we've ever seen. Now Tim is selling a *limited run* (only 20 copies each!) of matted 8.5" x 11" color ink-jet prints of these images (without all the messy text added in layout) for only \$15.00, plus shipping and handling.

To order your prints, contact Tim Hubley through email at:

102647.446@compuserve.com.

MOVING?

*Let us know
about it!*

Call
1-480-905-1906
and ask for
Joe Hovey.

Don't miss even
*one issue of
Cryonics!*



Do You Have Your Copy of *The First Immortal* Yet?

Alcor is selling a limited quantity of copies signed by the author, James Halperin.

Don't miss out—order yours *today!* **Signed Hardback: \$34.95**

Unsigned Hardback: \$24.95 Paperback (unsigned): \$6.99

Send check or money order to the Alcor Foundation, 7895 E. Acoma Dr., Suite 110, Scottsdale, AZ 85260. With Visa or Mastercard, call 1-480-905-1906.

BioTransport, Inc.

Is seeking emergency medical community professionals (EMT's, Paramedics, ER Technicians, Nurses and Physicians) for on-call contract response, to deliver cryotransport rescue services to member organizations and to the general public. For application forms and other information, contact Fred Chamberlain at 480-905-1906, or email to fred@biotransport.com, or linda@biotransport.com

Advertisements

Cryonics magazine reserves the right to accept or reject ads at our own discretion and assumes no responsibility for their content or the consequences of answering these advertisements. The rate is \$8.00 per line per issue (our lines are considered to be 66 picas wide). Tip-in rates per sheet are \$140 (printed one side) or \$180 (printed both sides), from camera-ready copy.

NanoTechnology Magazine

NanoTechnology Magazine is your window into the emerging technology whose awesome power mankind will acquire, for good or evil, very early in this new century. Everything will change radically...the industrial revolution was just a preview. Find out about the millions already spent by government and private labs on the atomic manipulation of matter. Follow monthly discoveries toward the evolution of the technology sure to dominate the 21st. century. Prepare yourself mentally with *NanoTechnology Magazine*.



1-year subscription: \$38.40
(check, M.O., or Credit Card).

NanoTechnology Magazine
4451 Sierra Dr.
Honolulu, HI 96816
(808) 737-0628 fax (808) 739-5145
<http://planet-hawaii.com/nanozine>

PERIASTRON

Publishing for immortalists since 1990
Now both a newsletter and a book!

*PERIASTRON, the bimonthly newsletter, keeps you up on scientific and technical advances bearing on cryotransport. Only \$3.00 per issue. Try it for one issue, you'll like it!

*A GUIDE TO ANTIAGING DRUGS, the book, tells you both the good and bad of each one. And it can be updated as we learn more! Send for free brochure.

PERIASTRON PUBLISHING

PO Box 208, O'Connor ACT 2602, Australia
Email: 73647.1215@compuserve.com

Fund CryoTransport Affordably with Life Insurance



Rudi Hoffman

Certified Financial Planner

Alcor member since 1994

Investments, Financial Services, Mutual Funds,
Insurance, Annuities, Living Trusts
\$120,000 20 Year Level, Renewable Term

Age 35	\$16.30 per month
Age 45	\$29.26 per month
Age 55	\$60.26 per month

Leave message on 800 voice mail for quote.

P.O. Box 290549, Port Orange, FL 32127
E-mail: rudihoffma@aol.com
1-800-749-3773



CryoTransport INSURANCE SPECIALIST

For more than 12 years, Mary Naples has underwritten more insurance policies for cryotransport funding than any other insurance agent. If you're looking for fast, dependable, informative service, call Mary today!

Mary E. Naples, CLU, ChFC

2400 Kehoe Avenue
San Mateo, CA 94403

800/645-3338

E-Mail: MNaples24@AOL.com

The Venturist promotes immortalist philosophy. For free sample write: The Venturists; 15111 N. Hayden Rd., Ste. 160-169, Scottsdale, AZ 85260

ORDER FORM

All prices are in U.S. dollars. Minimum order: \$5.00. Shipping and Handling not included. Overseas orders must be paid in U.S. dollars by Traveler's Cheques or International Money Order and must include additional 20% (of total) for shipping. All orders subject to availability and all prices subject to change.

Books and Videos

- ☐ *Code Blue*, by Nancy Fisher.....\$ 6.99
- ☐ *Cryonics: Reaching For Tomorrow*\$ 8.95
- ☐ *Engines of Creation*, by Eric Drexler.....\$ 10.95
- ☐ *Nanomedicine*, by Robert A. Freitas Jr.\$ 89.00
- ☐ *Chiller*, fiction by Sterling Blake.....\$ 5.95
- ☐ *Becoming Immortal*, by Wes DuCharme\$10.95
- ☐ *The First Immortal*, by James Halperin.....\$ 24.95
- ☐ *The First Immortal*, by James Halperin (autographed)....\$ 34.95
- ☐ *The First Immortal*, by James Halperin (paperback).....\$ 8.99
- ☐ *Baby Boomers' Guide*, by Terry Grossman.....\$ 19.95

Cryonics Magazine, 1 year (4 issues) Subscription

- ☐ United States.....\$ 25.00
- ☐ Canada/Mexico.....\$ 30.00
- ☐ Outside North America.....\$ 35.00

Clothing

- ☐ Alcor T-shirts (white or ash).....\$ 10.00
- ☐ Alcor hats.....\$ 10.00

Membership

- ☐ Alcor Membership Application Package..... Free

ARTICLES & REPRINTS

Cryobiology and the Feasibility of Cryonics

- ☐ The Molecular Repair of the Brain, by *Ralph Merkle, Ph.D.*\$ 3.00
- ☐ Will Cryonics Work? by *Steve Harris, M.D.*, plus Why Cryonics Probably Will Work, by *Michael Perry, Ph.D.*\$ 3.50
- ☐ Freezing of Living Cells, Mechanisms and Implications, by *Peter Mazur, Ph.D.*.....\$ 2.50
- ☐ "Cryobiology and the Feasibility of Cryonics" Package (all 4 of the above articles)\$ 7.50

Nanotechnology

- ☐ There's Plenty of Room at the Bottom, by *Richard P. Feynman, Ph.D.*\$ 1.50
- ☐ Molecular Technology and Cell Repair Machines, by *K. Eric Drexler, Ph.D.*\$ 2.00
- ☐ Nanotechnology, by *Brian Wowk*\$ 2.50
- ☐ Cell Repair Technology, by *Brian Wowk*\$ 2.50
- ☐ "Nanotechnology Package" (all 4 of the above articles)\$ 7.00

Memory, Identity, and the Brain

- ☐ The Terminus of the Self, by *Max More*\$ 3.00
- ☐ A Commented Bibliography on Brain and Memory, by *Thomas Donaldson, Ph.D.*\$ 2.00
- ☐ Isn't That You Behind Those Foster Grants? by *David Krieger*\$ 1.50

Cryotransport Reports (the human interest side)

- ☐ Her Blue Eyes Will Sparkle, by *Linda Chamberlain*\$ 2.00
- ☐ A Well-Loved Man, by *Mary Margaret Glennie*\$ 2.00

Alcor Legal History

- ☐ Our Finest Hours: Notes on the Dora Kent Crisis, by *Michael Perry, Ph.D.*\$ 2.50
- ☐ Motion for Award of Attorneys' Fees, by *David Epstein*\$ 2.50

General

- ☐ Elements of a Cryonics Patient Transport, by *Tanya Jones*\$ 2.00
- ☐ Frozen Souls: Can a Religious Person Choose Cryonics? by *Steve Bridge*\$ 1.50
- ☐ Lovecraft, Scientific Horror, Alienation, and Cryonics, by *Steve Harris, M.D.*\$ 1.50
- ☐ "Why We Are Cryonicists" and "Alcor: The Origin of Our Name" Free
- ☐ Why Cryonics Can Work (brochure)\$ 0.75
- ☐ Cryonics and Christianity (brochure)\$ 0.75

- ☐ Discount Package (All of the above Articles and Reprints).....\$ 35.00

The literature above can be ordered by mailing in this form with a check or money order SUBTOTAL: _____
or credit card authorization (Visa/MC), or by telephone (Visa/MC only) by calling Alcor: _____ +20% if overseas

1-480-905-1906 or by FAX: 1-480-922-9027.

NAME _____ PHONE _____

TOTAL: _____

ADDRESS _____ CITY _____ STATE _____ ZIP _____

VISA/MC# (circle one) _____ EXP _____

SIGNATURE(credit card numbers only) _____

Send your order to:
Alcor Foundation
7895 E. Acoma Dr., #110
Scottsdale, AZ 85260-6916