ALCOR LIFE EXTENSION FOUNDATION
A Non-Profit Organization

CRYONICS

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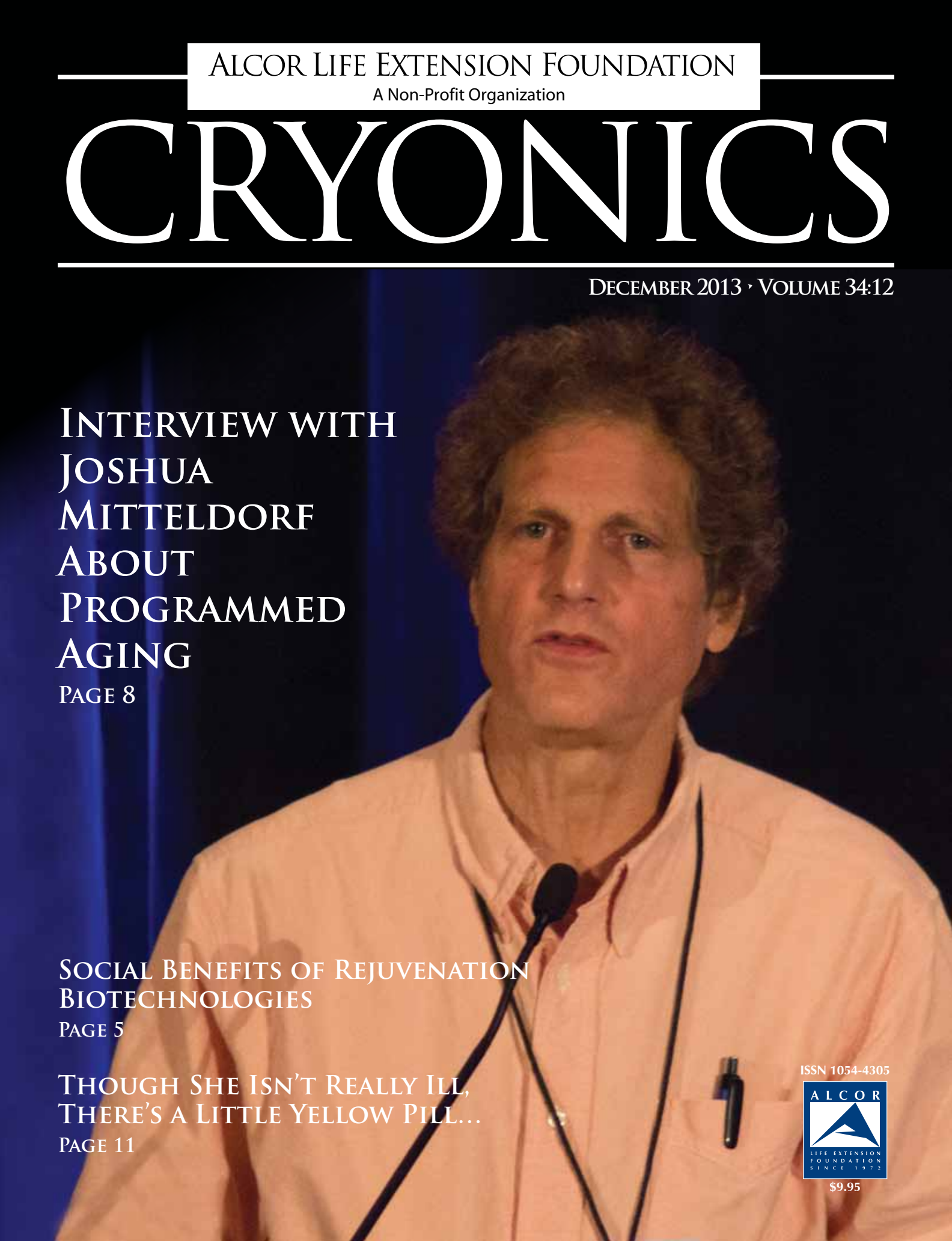

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CRYONICS

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Joshua Mitteldorf speaking at the 2012 Alcor conference.
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Interview with Joshua Mitteldorf About Programmed Aging

To most people and researchers, aging is a process of "wear and tear." According to Joshua Mitteldorf this perspective on aging should be replaced by the view that aging is programmed. In this interview he answers questions about what such a perspective implies about human evolution, how such an aging program is executed, and what kinds of anti-aging strategies are available to upset the aging program.

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CRYONICS

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2013 Annual Giving Program

Alcor provides a wide array of services for you the member, and the general public. We inform and educate, we protect and preserve, and we strive to remain at the forefront of cryonics technology.

Since its founding, Alcor has relied on member support to maintain its mission and attract new members. Your support, regardless of size, can provide a better future for all cryonicists. **Please act now.**

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We encourage every member to donate. Even if you can only afford $5 right now, you will make a significant contribution to Alcor's future.

Donations may be made via the Donations button on the Alcor website or by contacting Alcor's Finance Director, Bonnie Magee, at bonnie@alcor.org. Your donation may be made as a lump sum or divided into easy monthly payments. ■

The James Bedford Society

Gifts have played a fundamental role in the cryonics movement since its earliest days. Dr. James Bedford, a man whose extraordinary vision led him to become the first person to be cryopreserved, and the first to make a bequest to a cryonics organization, exemplified the determination of the early pioneers of cryonics. We invite you to follow in his footsteps, and join the James Bedford Society.

The James Bedford Society recognizes those who make a bequest of any size to the Alcor Life Extension Foundation. If you have already provided a gift for Alcor in your estate, please send a copy of your relevant documents to Alcor's Finance Director, Bonnie Magee.

If you'd like to learn more about setting up a bequest, send an email to bonnie@alcor.org or call 480-905-1906 x114 to discuss your gift. ■

QUOD INCEPIMUS CONFICIEMUS

Photo: Cryo-Care Equipment Corporation at 2340 E. Washington St., Phoenix, AZ. Dr. Bedford's "home" in 1970 or 1971.

SOCIAL BENEFITS OF REJUVENATION BIOTECHNOLOGIES By Aschwin de Wolf

When advocates of radical life extension discuss the social benefits of humans having much longer lifespans it is often a footnote to a *personal* desire to prolong life. As a consequence, cynicism from critics is often encountered. It hard to counter such skepticism effectively because people may believe you are just trying to make an essentially selfish desire look socially desirable.

There is an alternative. We can approach the topic from the other direction when we ask what kind of lifespans would be desirable if we wanted to increase social welfare and reduce human suffering. Let's look at a number of issues.

There is a large literature about coping with the death of loved ones, relatives, and friends. While many people find support from such self-help books, most people would agree that no amount of anticipation or coping can eliminate the suffering and devastation that follows the death of a loved one. Is there an upside? I am not aware of any serious writer pontificating about the positive aspects about a person dear to you dying or suffering from aging-related disabilities. A society in which humans have control over the aging process would be desirable because it would eliminate one of the main causes of death and the suffering it brings for survivors.

It is not uncommon to hear people being accused of not caring about the effects of their actions on future generations. This complaint is particularly prominent in discussions about the environment and the use of natural resources. If humans were not born to die on a predictable schedule this whole dynamic would change because the distinction between current and future generations would cease to exist. If we shifted focus from shorter to longer-term satisfactions involving our place and role in an enduring "family" of associates, we should not want humans to replace each other but to coexist in time and space.

Age discrimination involves discrimination of individuals on the basis of their age. In most instances, however, this discrimination concerns *biological* age and its effects on appearance, physical health, and mental skills. Biological age is not hard to observe and can usually be inferred from chronological age. If we prefer that people are not treated differently because of their date of birth we should want to live in a society where rejuvenation biotechnologies sever the link between chronological age and biological age.

What about economic welfare? Ageless people would be able to remain productive and generous, medical costs associated with the debilitating health and mental effects of biological aging would be substantially reduced, and highly talented people would not cease to exist.

Reasoning backwards from what morality and welfare would "dictate" about human lifespans is not just a talking point in discussions about the bio-ethics of life extension. One can imagine the rise of a social movement that seeks to educate the general public about the social benefits of biological control over the aging process. Such a social movement would not be in the business of making excuses for eccentric individual desires but would recommend that the reduction of suffering, sustainable growth, and more virtuous conduct would require that humans do not have a fixed expiration date. ■

CEO Update

By Max More

On November 1, Alcor took into our care A-2694, our (confidential) 118th patient. A-2694 was signed up just in time and later than optimal, with sign-up paperwork being completed just four days before being pronounced, financing being confirmed on the day of legal death. This case was also complicated by the patient being located in the Czech Republic where, we were initially and inaccurately told, we would not be able to carry out our procedures. A further complication—the massive St. Jude storm—prevented us from deploying equipment and supplies from England to the Czech Republic for field cryoprotection. See the Alcor news blog for more information.

Our 119th patient, A-2030, arrived shortly after noon on Friday, November 22. Remarkably, later on the very same afternoon, we received emergency messages about two possible additional cases. One message concerned an individual who had been interested in cryonics but who had not made arrangements. The other concerned a very recently signed-up member. As I am writing this the day after first contact, it is too early to report further.

We also had a possible postmortem case from Asia, but that didn't work out. In addition, we discussed a possible charity case for an ex-member, but he decided not to pursue it.

NEW ADVISOR

We are delighted to announce the latest addition to Alcor's advisors, Keegan Macintosh. You may know him from his monthly column in *Cryonics* and/or his Alcor-40 talk.

NEW "ALCOR CRYONICS" YOUTUBE CHANNEL

As a core part of a vigorous drive to vastly improve Alcor's social media presence, I have create a YouTube channel. Here you will find videos of Alcor-40 talks, links to other Alcor- and cryonics-relevant videos, and a growing series of short FAQ videos dealing with common misconceptions, questions, and objections. I will be adding more new FAQ videos over the coming months. Let me know if you have seen other YouTube videos supportive of Alcor or cryonics, and we will add them to the roster of related videos: http://www.youtube.com/channel/UCUh9FLcWu8k5k5W_ofWQMZA/videos

UNDERFUNDING BILLING

All members whose funding is below current minimums should by now have received a bill for underfunding (UF) dues. The initial billing is for the last four months of 2013 (since the plan was formally adopted) and the rate is only one third of the eventual amount (which will be equal to 1% of your underfunding per year). It's remarkable how many members seem to be unaware of their inadequate level of funding despite our many letters and articles on the subject. We hope that the implementation of this plan will finally raise awareness of this problem on an individual level. Even members who are wealthy have not, in many cases, raised their funding to current minimums.

I thank the considerable number of you who have raised your funding levels since we started focusing on a solution to the problem in 2011. The total level of underfunding has declined considerably, reducing the threat to Alcor's future financial security when members are cryopreserved and costs incurred. We urge those of you who are working to set up wealth preservation trusts to first ensure that you are fully funded.

PRIORITIES

These have not changed a great deal since last year. Of course I will continue to work closely to coordinate with SA. I will make a much greater effort at fundraising, both for the Membership Dues Reduction Fund and, when it is in final form, the Endowment Fund. Other fundraising areas include research and the PCT. Another focus is to find ways to reduce costs for members, including helping the Hardship Committee, and examining CMS waiver possibilities, alternative funding options, and lower-cost options, and perhaps carefully designed lifetime memberships.

I will be pushing to reignite growth, partly through a social media project to boost interest and inquiries leading to new members. I will encourage more research (and better communication of the research we do), and work on getting more feedback on the quality of cases, especially by doing CTs on neuros, conducting biopsies, and making use of end tidal C02 monitoring. It will be a major concern to help educate members and encourage them to better plan for inflation. This will include revising the cost information on the website.

MEDIA

We have to turn down quite a few requests for interviews of filming because the level of media interest is often too high for our available time (or because the opportunity seems not worth the investment of effort). We've enjoyed some recent and very

positive pieces of video coverage. One of these was a NOVA web special on Alcor and cryonics. The NOVA team had filmed at Alcor originally for a broadcast show titled "Making Things Colder" (which also featured research at 21st Century Medicine) but we didn't make the cut due to excessive material. However, the footage was used for a web special which you can view here: http://www.pbs.org/wgbh/nova/tech/cryonics.html

The other highly positive video was a follow-up by Germany's Galileo TV on a 1999 visit to Alcor. Their 2013 update had an impressive quality of filming and gave a good impression of Alcor. The producer said that the German version was seen by 1.8 million. We're hoping to make this (stripped of the German voiceover) available online.

Other media includes a story, "Who wants to live forever? Maybe you can" on MSN Innovation, October 15; an interview for *The Longevity Show*, and one for a Dutch publication. I also gave a talk at the Venturist conference in Laughlin, NV on improvements at Alcor.

TV and film interest in cryonics: I read an early outline for a television series which apparently is being greenlit for a pilot. The premise is interesting and promising from our perspective. Rather than simply using cryonics as a tool for getting someone into the future, it is a central focus. Each episode will follow someone who has been successfully revived from cryopreservation. If the show continues to be developed, I may be able to continue to have some input. I also have a script for a proposed movie, written by an Alcor member and established director.

SOCIAL MEDIA

I am also working on a comprehensive, integrated social media plan ("Operation Educate and Motivate.") We know that general advertising is both expensive and inefficient. An integrated social media effort can cost very little yet have substantial effects in attracting and holding interest. The goal is to greatly enhance Alcor's online presence, generating more awareness—and more favorable awareness—and convert that into new members (at least initially at the Associate level) through changes to the website and better use of the blog, YouTube, Facebook, Reddit, newly-created infographics, and perhaps Pinterest and one or two others such as Instagram.

We have had good gains in Associate Membership, with quite a few additions from a special offer made to viewers of a YouTube video of me giving a tour of Alcor, posted on Singularity Weblog. This received over 36,000 views. After asking the video's editor, Nikola Danylov, to add a note that viewers could receive a free Associate Membership, we have received something like a dozen requests. (These were from probably the last 5,000 views.)

Converting interest into membership: I have given many talks and media interviews. It has been difficult to convert the resulting attention and interest into new members. One obstacle is that so many potential members find the cost too high. There is some observable effect in that we do get inquiries resulting from the talks. And the effect is not usually going to be immediate—the person may have to think about it for quite a while, and perhaps receive further communications about cryonics before taking action.

But I want to do more to get people started on the path to membership, using the relatively easy step of Associate Membership, offered for free for a year. Rather than simply mentioning the free memberships, I could take distinguished-looking cards to talks and hand them out. Those cards would have not only a URL but a barcode that takes you directly to the AM signup page, or perhaps to a microsite with core information along with the signup form.

ALTERNATIVE FUNDING METHODS

An interesting and intriguing conversation with a member has motivated me to push harder for us to investigate and find relatively low-risk ways to allow members to use alternative funding methods for their cryopreservation. This conversation highlighted ways to reduce the risk and difficulty of accepting assets such as real estate—for instance, turning transferred property over to a property management company; and using a real estate recordation system and title check so that no one can put in a claim ahead of Alcor. A simple escrow account would be similar to prepaying but the member maintains ownership.

Another mechanism for greatly reducing the risks to Alcor of accepting assets may be for the member to give Alcor a promissory note backed by a deed of trust. Pay on Death (POD) account—also called Transfer on Death (TOD) enables funds to bypass the probate process and be drawn on immediately by Alcor, on presenting a death certificate. No executor is involved and the transfer can be made irrevocable. I have made inquiries to our bank about POD/TOD mechanisms and for which kinds of accounts we can use them. These would not be sufficient on their own, since we also need to know if there are any funds in the accounts. This will require something like a collateral assignment.

CONTRIBUTIONS WANTED!

The end of the year is a traditional time for individuals with resources to contribute funding to worthy causes, but any time is a good time for Alcor-related contributions. If you would like to support Alcor (and give less to the tax man), we could benefit from contributions to these:

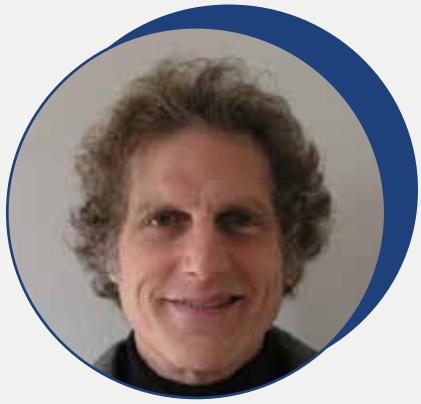
Membership Dues Reduction Fund: As explained in the October issue of *Cryonics*, this fund is designed to allow us to reduce membership dues over a 10-year period in order to improve members retention and to accelerate membership growth, creating a virtuous cycle of economies of scale in which we continuously reduce the cost of dues, grow faster, and improve Alcor's finances.

Endowment Fund: Alcor operations can draw on the Endowment Fund at a maximum rate of 2% per year. Contributions to this fund therefore provide long-term, sustainable support to the organization. The larger the income from this fund grows, the less we need to rely on membership dues.

Research Fund: Not only is research important for improving the quality of our procedures and hastening the day when patients can be repaired and revived, spending on research helps protect our tax-exempt status.

Hardship Fund: It is crucial that Alcor take action to address the multi-million dollar problem of members with below-minimum funding. At the same time, we recognize that some members truly struggle to meet the costs of membership, life insurance payments, and additional dues for underfunding. Although we have seeded the Hardship Fund with $20,000 from Alcor's reserve fund (and the Life Extension Foundation has contributed additional funds), we welcome contributions that allow us to help distressed members who lack other options. ■

Interview with Joshua Mitteldorf



The following interview with Joshua Mitteldorf is the third in a series of interviews with prominent scientists in the field of aging.

1. Can you briefly describe your view that aging is programmed?

From the perspective of theory, programmed aging is completely unexpected. Even what I call the "left wing" of evolutionary theory would not predict that the individual would evolve to sacrifice himself for the group so reliably. But the empirical evidence is overwhelming.

The genetic basis for aging is very old, and has been conserved for a billion years, from the simplest one-celled eukaryotes up through mammals and humans. Of course, there are lots of genes that have this kind of long legacy, but they are all part of the core processes essential to life. Evidently, evolution has treated aging as a core process, essential to life.

- Life span is extended not by making it easier for the body but by putting challenges in the body's way: Starvation, physical exertion (generating free radicals!), extremes of heat and cold, even some toxins extend life span. You have to think that the body is not doing its best to live a long time when it has plenty of food, and is comfortable and unstressed.

- It's surprisingly easy to create genetically modified organisms (worms, flies, mice…) that live longer than the same animals found in the wild. This is almost always done not by giving them some new gene they didn't have, but by knocking out a gene that nature put there. The record for life extension in *C. Elegans* worms comes from Robert Shmookler-Reis's lab. They knocked out both copies of a gene that is essential for energy generation in the worms, and they lived ten times as long. http://www.ncbi.nlm.nih.gov/pubmed/17996009

- There are two ancient mechanisms of programmed death in protozoans, called *apoptosis* and *cellular senescence.* Yeast cells will initiate apoptosis when they detect that the cell colony is starving. They literally dismember their own cell, break it down and turn it into food for neighboring cells. Cellular senescence is a mechanism where some protozoans (e.g. *paramecia*) count how many times they have reproduced themselves and, if they have not shared genes with neighboring paramecia, they languish and die. Both cellular senescence and apoptosis are part of the cell cycle in our own bodies, and both mechanisms contribute to human aging.

2. What are the major differences of opinion *between* advocates of programmed aging?

We have different ideas of the evolutionary significance of aging. For example, most advocates of programmed aging think that aging evolved for the purpose of promoting population turnover, so that the community can evolve more rapidly. I have promoted the theory that the community benefits from aging because death is spread out and predictable, avoiding extinctions. If it weren't for aging, everyone would be dying at the same time, during a famine, for example, or an epidemic. The population would be much more volatile, and prone to extinction.

3. Does a belief in programmed aging *necessarily* imply group selection in evolution?

Yes. There can be no individual benefit from aging. Aging is by definition an individual's loss of fitness over time.

"Life span is extended not by making it easier for the body but by putting challenges in the body's way: Starvation, physical exertion (generating free radicals!), extremes of heat and cold, even some toxins extend life span."

4. Empirical examples of programmed aging can often be restated as examples of wear and tear and vice versa. What kind of evidence in humans would you say would provide unambiguous support for the hypothesis that aging is programmed?

As we get older, the body's repair and maintenance machinery slows down. Damage accumulates. This looks just like "wear and tear" but it is programmed in the

sense that the body *could* repair the damage but *doesn't*. For example, the antioxidants *CoQ10* and glutathione decline with age. Our bodies just make less of them.

But there are other ways in which human aging is an active process that doesn't look at all like "wear and tear." For example, inflammation is turned against the body's own cells. Inflammation is an essential defense mechanism, used to destroy damaged cells and invading microbes. As we get older, the inflammation mechanism is co-opted in a process of self-destruction. Inflammation contributes to all the major diseases of old age.

The two mechanisms of programmed cell death that I mentioned above also are active mechanisms of self-destruction. *Apoptosis* is programmed cell death, and it destroys our muscle cells, creating the weakness and muscle atrophy that we associate with old age. Apoptosis destroys healthy nerve cells in our brains, and this leads to dementia. *Cellular senescence* is another name for telomere shortening. Stem cells are constantly creating new blood cells and skin cells for us, because these are short-lived and turn over every few days. But with age, the telomeres in the stem cells get short, and the stem cells can no longer do their job. Telomere attrition is completely avoidable, if the body wanted to avoid it—all it takes it the enzyme *telomerase* which is available in the DNA of every cell, but it is held back, causing the stem cells to become senescent. Senescent cells are not only failing to pull their weight—they are also toxic to surrounding tissue.

5. Is it possible that aging is programmed but that the body does not consult an "aging clock" to make us age?

That's a deep question, and I think the jury is still out. Is there a central clock—maybe the *hypothalamus* deep in the brain—or is the aging process widely distributed through cells, as for example all the stem cells that are individually counting their replications with their telomeres?

6. Can we make the human body believe that it is still young?

We who believe in programmed aging tend to be optimistic about rejuvenation therapies. We think that the body is perfectly capable of restoring a youthful state, and needs only the proper signaling to restore itself to a youthful state. Two of the most promising examples of that are

- Telomerase activators are medicines or supplements we can take that stimulate our cells to re-grow their telomeres. There is early, preliminary evidence of dramatic rejuvenation in mice given telomerase therapy. (The catch is that these mice were genetically engineered to suffer from short telomeres in the first place.) http://www.nature.com/nature/journal/v469/n7328/full/nature09603.html

- There may be hormones and other chemicals that circulate in our blood that tell the body how old it is. Old people's blood has too much of some things and too little of others. If we restore a youthful profile to chemical signals in the blood, it may be that the body responds by restoring a youthful state. Harold Katcher has been a prominent advocate of trying this procedure. http://www.programmed-aging.org/theory-3/Katcher_heterochronic_plasma_exchange.pdf

7. If we are supposed to age, does it not follow that a lot of things that are known to be "healthy" will not do much to slow aging?

That's exactly right. We've been focused for 50 years on the evils of modern life—the toxins and the radiation and the stress. We're obsessed with the insults that Western technology has imposed on our bodies. So we want to eat organic foods, lower our anxiety levels, avoid fish that has mercury and water with fluorine. These are all good things to do, and may improve our health. But they have nothing to do with life extension.

If our life spans are programmed into our genes, we'll have to disrupt that program in order to live longer. We can't do it by pampering or protecting ourselves.

"We who believe in programmed aging tend to be optimistic about rejuvenation therapies. We think that the body is perfectly capable of restoring a youthful state, and needs only the proper signaling to restore itself to a youthful state."

8. Is it possible that aging is a combination of an evolved program *and* wear and tear? In other words, would you expect any progressive physiological deterioration if the aging program is halted?

Take a look at the answer to #4. Some of the ways in which aging is programmed involve slowing down the repair mechanisms, so that damage is allowed to accumulate.

9. Not many people are interested in radical life extension or cryonics. Is it possible that our psychology has co-evolved to embrace aging, too?

Freud certainly thought so. Toward the end of his life, he started writing about a "death drive" in addition to the better-known drives for sex, for power, etc. which he proposed. Many older people suffer from chronic pain, and they can no longer do the things that gave them joy and exhilaration when they were young. Death starts to look not so bad.

It's also true that we live our lives knowing that death is inevitable. Social psychologists speak of the phenomenon of *cognitive dissonance* which tends to make a virtue of necessity. If I'm going to die and there's nothing much I can do about it, then maybe death isn't such a bad thing. This kind of thinking is wired into our brains.

In the face of this, the broad Life Extension Movement offers a radical new possibility. Suppose we don't have to lose our physical faculties. Suppose we retain our capacity for joy and passion and exhilaration, and we're free from physical pain. Suppose that our minds remain flexible and open to new modes of thinking. The world is rapidly changing, in some ways that are pregnant with excitement and promise, and in other ways that threaten freedom and democracy and natural biodiversity and all that we hold dear. What an adventure is in store for those of us that live to participate in this epic global struggle! This is some of the promise that life extension holds out for those of us who see and embrace it.

"If our life spans are programmed into our genes, we'll have to disrupt that program in order to live longer. We can't do it by pampering or protecting ourselves."

10. Which life extension strategies that exist today hold the most promise?

I'm putting my bets on two fields.

- Telomerase therapies are very close to offering a therapy that I think will be rejuvenating. There are herbal products already on the market that modestly extend telomere length. Sierra Sciences is a Reno, NV company with the know-how to create dramatically more effective telomerase activators in just a few years' time, and they are tragically stalled for lack of venture capital.

- *Epigenetics* is the science of which genes get expressed where and when. As we age, some genes are turned on and others turned off, and both these contribute to aging. Gene expression is controlled, in part, by the process of *methylation*. Little bumps are added to the chromosome that act as "Do Not Disturb" signs and determine which genes are turned off. Just last week, Steve Horvath of UCLA published a spectacular paper claiming to have decoded this pattern of methylation so that he can determine the age of a cell sample with 97% accuracy. It may be that a few years down the road, we can re-program our methylation and patterns to a more youthful state.

My belief is that *telomere length* and *methylation* are two of the body's primary aging clocks, and that as we learn how to reset these clocks, we will be able to restore our youth.

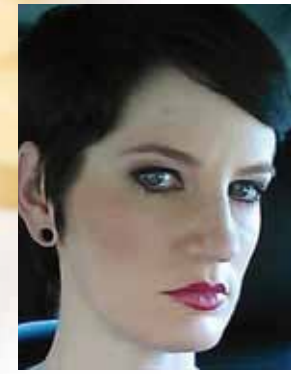
11. Can you tell us about the book that you are working on?

I've written and rewritten a book http://SuicideGenes.org about all the themes you ask about in this interview. I've been frustrated by several academic publishers that have been enthusiastic about publishing my book, and some of the reviews have been glowing. But three publishers have gotten cold feet when they encountered the vehement objections of evolutionary theorists in the field who say that programmed aging is wrong, wrong, wrong, and that the press will embarrass itself by publishing my book.

I am now exploring publication outside of university presses, and have promised my readers that the book will come out in 2014, self-published if need be. ■

Josh Mitteldorf studies evolutionary theory of aging using computer simulations. Mitteldorf has taught a weekly yoga class for thirty years. He is an advocate for vigorous self care, including exercise, meditation and caloric restriction. After earning a PhD in astrophysicists, Mitteldorf moved to evolutionary biology as a primary field in 1996. He has taught at Harvard, Berkeley, Bryn Mawr, LaSalle and Temple University. He is presently affiliated with MIT as a visiting scholar.

COOLER MINDS PREVAIL



THOUGH SHE ISN'T REALLY ILL, THERE'S A LITTLE YELLOW PILL…

By Chana de Wolf

Humans have been ingesting mind- and mood-altering substances for millennia, but it has only rather recently become possible to begin to elucidate drug mechanisms of action and to use this information, along with our burgeoning knowledge of neuroscience, to design drugs intended to have a specific effect. And though most people think of pharmaceuticals as "medicine," it has become increasingly popular to discuss the possibilities for the use of drugs in *enhancement*, or improvement of "human form or functioning beyond what is necessary to sustain or restore good health" (E.T. Juengst; in Parens, 1998, p 29).

Some (transhumansits) believe that enhancement may not only be possible, but that it may even be a moral duty. Others (bioconservatives) fear that enhancement may cause us to lose sight of what it means to be human altogether. It is not the intention of this article to advocate enhancement or to denounce it. Instead, let's review some of the drugs (and/or classes of drugs) that have been identified as the most promisingly cognitive- or mood-enhancing. Many of the drugs we will cover can be read about in further depth in *Botox for the brain: enhancement of cognition, mood and pro-social behavior and blunting of unwanted memories* (Jongh, R., et al., *Neuroscience and Biobehavioral Reviews* 32 (2008): 760-776).

Of most importance in considering potentially cognitive enhancer drugs is to keep in mind that, to date, no "magic bullets" appear to exist. That is, there are no drugs exhibiting such specificity as to have only the primary, desired effect. Indeed, a general principle of trade-offs (particularly in the form of side effects) appears to exist when it comes to drug administration for any purpose, whether treatment or enhancement. Such facts may constitute barriers to the practical use of pharmacological enhancers and should be taken into consideration when discussing the ethics of enhancement.

Some currently available cognitive enhancers include donepezil, modafinil, dopamine agonists, guanfacine, and methylphenidate. There are also efforts underway to develop memory-enhancing drugs, and we will discuss a few of the mechanisms by which they are proposed to act. Besides cognitive enhancement, the enhancement of mood and pro-social behavior in normal individuals are other types of enhancement that may be affected pharmacologically, most usually by antidepressants or oxytocin. Let's briefly cover the evidence for the efficacy of each of these in enhancing cognition and/or mood before embarking on a more general discussion of the general principles of enhancement and ethical concerns.

One of the most widely cited cognitive enhancement drugs is **donepezil** (Aricept®), an acetylcholinesterase inhibitor. In 2002, Yesavage et al. reported the improved retention of training in healthy pilots tested in a flight simulator. In this study, after training in a flight simulator, half of the 18 subjects took 5 mg of donepezil for 30 days and the other half were given a placebo. The subjects returned to the lab to perform two test flights on day 30. The donepezil group was found to perform similarly to the initial test flight, while placebo group performance declined. These results were interpreted as an improvement in the ability to retain a practiced skill. Instead it seems possible that the better performance of the donepezil group could have been due to improved attention or working memory during the test flights on day 30.

Another experiment by Gron et al. (2005) looked at the effects of donepezil (5 mg/day for 30 days) on performance of healthy male subjects on a variety of neuropsychological tests probing attention, executive function, visual and verbal short-term and working memory, semantic memory, and verbal and visual episodic memory. They reported a selective enhancement of episodic memory performance, and suggested that the improved performance in Yesavage et al.'s study is not due to enhanced visual attention, but to increased episodic memory performance.

Ultimately, there is scarce evidence that donepezil improves retention of training. Better designed experiments need to be conducted before we can come to any firm conclusions regarding its efficacy as a cognitive-enhancing.

The wake-promoting agent **modafinil** (Provigil®) is another currently available

drug that is purported to have cognitive enhancing effects. Provigil® is indicated for the treatment of excessive daytime sleepiness and is often prescribed to those with narcolepsy, obstructive sleep apnea, and shift work sleep disorder. Its mechanisms of action are unclear, but it is supposed that modafinil increases hypothalamic histamine release, thereby promoting wakefulness by indirect activation of the histaminergic system. However, some suggest that modafinil works by inhibiting GABA release in the cerebral cortex.

In normal, healthy subjects, modafinil (100-200 mg) appears to be an effective countermeasure for sleep loss. In several studies, it sustained alertness and performance of sleep-deprived subjects (up to 54.5 hours) and has also been found to improve subjective attention and alertness, spatial planning, stop signal reaction time, digit-span and visual pattern recognition memory. However, at least one study (Randall et al., 2003) reported "increased psychological anxiety and aggressive mood" and failed to find an effect on more complex forms of memory, suggesting that modafinil enhances performance only in very specific, simple tasks.

The **dopamine agonists** d-amphetamine, bromocriptine, and pergolide have all been shown to improve cognition in healthy volunteers, specifically working memory and executive function. Historically, amphetamines have been used by the military during World War II and the Korean War, and more recently as a treatment for ADHD (Adderall®). But usage statistics suggest that it is commonly used for enhancement by normal, healthy people—particularly college students.

Interestingly, the effect of dopaminergic augmentation appears to have an inverted U-relationship between endogenous dopamine levels and working memory performance. Several studies have provided evidence for this by demonstrating that individuals with a low working-memory capacity benefit from greater improvements after taking a dopamine receptor agonist, while high-span subjects either do not benefit at all or show a decline in performance.

Guanfacine (Intuniv®) is an α2 adrenoceptor agonist, also indicated for treatment of ADHD symptoms in children, but by increasing norepinephrine levels in the brain. In healthy subjects, guanfacine has been shown to improve visuospatial memory (Jakala et al., 1999a, Jakala et al., 1999b), but the beneficial effects were accompanied by sedative and hypotensive effects (i.e., side effects). Other studies have failed to replicate these cognitive enhancing effects, perhaps due to differences in dosages and/or subject selection.

Methylphenidate (Ritalin®) is a well-known stimulant that works by blocking the reuptake of dopamine and norepinephrine. In healthy subjects, it has been found to enhance spatial working-memory performance. Interestingly, as with dopamine agonists, an inverted U-relationship was seen, with subjects with lower baseline working memory capacity showing the greatest improvement after methylphenidate administration.

Future targets for enhancing cognition are generally focused on enhancing plasticity by targeting glutamate receptors (responsible for the induction of long-term potentiation) or by increasing CREB (known to strengthen synapses). Drugs targeting AMPA receptors, NMDA receptors, or the expression of CREB have all shown some promise in cognitive enhancement in animal studies, but little to no experiments have been carried out to determine effectiveness in normal, healthy humans.

Beyond cognitive enhancement, there is also the potential for enhancement of mood and pro-social behavior. Antidepressants are the first drugs that come to mind when discussing the pharmacological manipulation of mood, including selective serotonin reuptake inhibitors (SSRIs). Used for the treatment of mood disorders such as depression, SSRIs are not indicated for normal people of stable mood. However, some studies have shown that administration of SSRIs to healthy volunteers resulted in a general decrease of negative affect (such as sadness and anxiety) and an increase in social affiliation in a cooperative task. Such decreases in negative affect also appeared to induce a positive bias in information processing, resulting in decreased perception of fear and anger from facial expression cues.

Another potential use for pharmacological agents in otherwise healthy humans would be to blunt unwanted memories by preventing their consolidation. This may be accomplished by post-training disruption of noradrenergic transmission (as with β-adrenergic receptor antagonist **propranolol**). Propranolol has been shown to impair the long-term memory of emotionally arousing stories (but not emotionally neutral stories) by blocking the enhancing effect of arousal on memory (Cahill et al., 1994). In a particularly interesting study making use of patients admitted to the emergency department, post-trauma administration of propranolol reduced physiologic responses during mental imagery of the event 3 months later (Pitman et al., 2002). Further investigations have supported the memory-blunting effects of propranolol, possibly by blocking the reconsolidation of traumatic memories.

GENERAL PRINCIPLES

Reviewing these drugs and their effects leads us to some general principles of cognitive and mood enhancement. The first is that many drugs have an inverted U-shaped dose-response curve, where low doses improve and high doses impair performance. This is potentially problematic for the practical use of cognition enhancers in healthy individuals, especially when doses that are most effective in facilitating one behavior simultaneously exert null or detrimental effects on other behaviors.

Second, a drug's effect can be "baseline-dependent," where low-performing individuals experience greater benefit from the drug while higher-performing individuals do not see such benefits (which might simply reflect a ceiling effect), or may, in fact, see a deterioration in performance (which points to an inverted U-model). In the case of an inverted U-model, low-performing individuals are found on the up slope of the inverted U and thus benefit from the drug, while high-performing individuals are located near the peak of the inverted U already and, in effect, experience an "overdose" of neurotransmitter that leads to a decline in performance.

Trade-offs exist in the realm of cognitive enhancing drugs as well. As mentioned, unwanted "side effects" are often experienced with drug administration, ranging from mild physiological symptoms such as sweating to more concerning issues like increased agitation, anxiety, and/or depression.

More specific trade-offs may come in the form of impairment of one cognitive ability

at the expense of improving another. Some examples of this include the enhancement of long-term memory but deterioration of working memory with the use of drugs that activate the cAMP/protein kinase A (PKA) signaling pathway. Another trade-off could occur between the stability versus the flexibility of long-term memory, as in the case of certain cannabinoid receptor antagonists which appear to lead to more robust long-term memories, but which also disrupt the ability of new information to modify those memories. Similarly, a trade-off may exist between stability and flexibility of working memory. Obviously, pharmacological manipulations that increase cognitive stability at the cost of a decreased capacity to flexibly alter behavior are potentially problematic in that one generally does not wish to have difficulty in responding appropriately to change.

Lastly, there is a trade-off involving the relationship between cognition and mood. Many mood-enhancing drugs, such as alcohol and even antidepressants, impair cognitive functioning to varying degrees. Cognition-enhancing drugs may also impair emotional functions. Because cognition and emotion are intricately regulated through interconnected brain pathways, inducing change in one area may have effects in the other. Much more research remains to be performed to elucidate these interactions before we can come to any firm conclusions.

ETHICAL CONCERNS

Again, though it is not the place of this article to advocate or denounce the use of drugs for human enhancement, obviously there are considerable ethical concerns when discussing the administration of drugs to otherwise healthy human beings. First and foremost, safety is of paramount importance. The risks and side-effects, including physical and psychological dependence, as well as long-term effects of drug use should be considered and weighed heavily against any potential benefits.

Societal pressure to take cognitive enhancing drugs is another ethical concern, especially in light of the fact that many may not actually produce benefits to the degree desired or expected. In the same vein, the use of enhancers may give some a competitive advantage, thus leading to concerns regarding fairness and equality (as we already see in the case of physical performance-enhancing drugs such as steroids). Additionally, it may be necessary, but very difficult, to make a distinction between enhancement and therapy in order to define the proper goals of medicine, to determine health-care cost reimbursement, and to "discriminate between morally right and morally problematic or suspicious interventions" (Parens, 1998). Of particular importance will be determining how to deal with drugs that are already used off-label for enhancement. Should they be provided by physicians under certain conditions? Or should they be regulated in the private commercial domain?

There is an interesting argument that using enhancers might change one's authentic identity—that enhancing mood or behavior will lead to a personality that is not really one's own (i.e., inauthenticity), or even dehumanization—while others argue that such drugs can help users to "become who the really are," thereby strengthening their identity and authenticity. Lastly, according to the President's Council on Bioethics, enhancement may "threaten our sense of human dignity and what is naturally human" (The President's Council, 2003). According to the Council, "the use of memory blunters is morally problematic because it might cause a loss of empathy if we would habitually 'erase' our negative experiences, and because it would violate a duty to remember and to bear witness of crimes and atrocities." On the other hand, many people believe that we are morally bound to transcend humans' basic biological limits and to control the human condition. But even they must ask: what is the meaning of trust and relationships if we are able to manipulate them?

These are all questions without easy answers. It may be some time yet before the ethical considerations of human cognitive and mood enhancement really come to a head, given the apparently limited benefits of currently available drugs. But we should not avoid dealing with these issues in the meantime; for there will come a day when significant enhancement, whether via drugs or technological means, will be possible and available. And though various factions may disagree about the morality of enhancement, one thing is for sure: we have a moral obligation to be prepared to handle the consequences of enhancement, both positive and negative. ■

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CARRYING ON:
THE AFTERMATH AND LEGACY OF EARLY NEW YORK CRYONICS

By R. Michael Perry

By the mid-1970s, cryonics in important ways had become a wasteland. Early hopes had not been realized. Cryonics had not become a widespread practice, but only the preoccupation of a few hardy individuals who doggedly, sometimes grimly persisted. Of the roughly two dozen cryopreservations that had occurred, most had been terminated or soon would be. In New York especially the once promising activity had all but ground to a halt. Funding had run short and patients had been handed back to relatives who were unable or unwilling to maintain them. Here we take a look at events in this time of trial. Most of the important players in New York cryonics went elsewhere, and New York would not recover its former preeminence, though its activity never entirely ceased and there still are cryonicists in New York. Meanwhile cryonics as a whole was able to weather the hardships and emerge with new vigor by the 1980s.

As a disclaimer: much of this often disenchanting history was not well-reported in contemporary sources such as newsletters but has been reconstructed from later recollections, notably by Curtis Henderson and Mike Darwin (for both of whom there are extensive sources online). Curtis especially has an entertaining style and I've generously borrowed from him here as elsewhere in this series on cryonics in New York. Nobody is perfect, as the saying goes; inaccuracies and incompleteness in what follows, from whatever source, may be remedied over time with further research. As usual, material in square brackets [ ] has been added editorially by me.

TRANS TIME COMES OF AGE

By early 1974, all but one or two of the Cryonics Sociey of New York's patients had been returned to relatives and taken away. (Clara Dostal would not be buried until late in the year.) Curtis Henderson who still headed CSNY was relieved, but then was confronted with another case. "Frank Riley" was frozen by his son with the assistance of Mike Darwin and an associate, and Riley Jr. now needed a place to store his father. CSNY was relatively close, but now moribund. Also close by was Nick DeBlasio's facility at the Mt. Holiness Cemetery in Butler, New Jersey, which had been set up with the help of Robert Nelson of the Cryonics Society of California along the lines of CSC's main facility in Chatsworth. Mike, with serious misgivings about the DeBlasio facility (well-founded as we shall see), strongly recommended against that choice too, and instead favored a recent cryonics startup, Trans Time, Inc. near Berkeley, California. Trans Time was founded in 1972 and headed by Art Quaife, whom a reluctant Curtis Henderson now contacted when pressed by Riley Jr.[1]

"…I was totally out, finally clear of those bodies. I had a real good deal working for Bell and Howell. I said I'm never going to store bodies again, but this guy [Riley Jr.] kept insisting, and he has a roll of $100 bills. Meanwhile I'm so broke, I'm burning the old wooden boat in the fireplace to keep the house warm. So, I go to the phone and I call Art Quaife, who says he has a freezing facility in the Bay Area, Trans Time. In the meantime, this Dostal woman [daughter of Clara who was frozen and still being maintained by Curtis] still owes me $1,500 for dry ice, and her [mother's unused cryogenic] tank is lying in a field in the cemetery. She wanted to be an actress. That's why she went along with the freezing of her mother, because she thought she was going to get on television. So, I called Art Quaife, I said I got a man here who needs a place to store his father, who he's just frozen in Maryland, and he doesn't care what it costs. So there was a long silence, and then Art says, he don't have nothing. All he has is a house that hangs off the cliff and tilts, and you walk in the door and you feel like you're falling straight to Alcatraz."

In earlier years CSNY had enjoyed the patronage of two volunteer assistants and budding young researchers, Paul Segall and Harold Waitz, respectively Director of Biological Research and Director of Engineering Research at Life Extension Research Laboratory in Lindenhurst, Long Island.[2] This was a small, garage laboratory set up with the help of a friend and also life-extension enthusiast, Bruce Cohen.[3] Previously, while at New York University as a student, Paul had attempted to complete his doctoral work with experiments aimed at increasing the life-span of laboratory animals through dietary restriction. Frustrated by the lack of interest and

support for his project, he relocated to the University of Pittsburgh, only to find similar obstacles which prompted him to return to NYU. But he could not do his experiments on campus but only in his garage lab. There he found he could greatly slow the growth of rodents by deprivation of the essential amino enzyme tryptophan but even so "the mice were eating better than I was." In 1971 Paul relocated to the University of California, Berkeley to complete his doctoral dissertation, lured by the promise of "a real laboratory to work in instead of a garage," and other support, under the noted aging researcher Paola Timiras. Paul was excited about the move.

"Berkeley turned out to be the answer to my dreams. Dr. Timiras had a keen interest in aging research. Like [her doctoral advisor Hans] Selye[, the founder of stress theory who had also made several contributions to aging theory,] she [was] a bold, well-informed, insightful investigator with a strong background in both theoretical and medical physiology. While most scientists would run for cover when I told them what I was interested in, she just smiled. Over the years she [would be] of invaluable help to me, defending me from the attacks of colleagues less enamored of my goals while gently directing my efforts toward the achievable. She [had] an uncanny sense of what can or cannot be done. And she [was] almost always right."[4]

Paul was joined in Berkeley by Harry Waitz and eventually Bruce Cohen, all becoming active in Trans Time. Paul meanwhile conducted experiments under Dr. Timiris's careful guidance, completing his Ph.D. in physiology in 1977. (Waitz would finish his doctorate in biophysics and medical physics, also at UC Berkeley, in 1983.) In Segall's experiments mice were indeed made to live (and also reproduce) longer through tryptophan deprivation, though the longest-lived were from groups with a high mortality rate due to the extreme deprivation, and tryptophan deprivation does not look promising for application to humans.[5] Curtis Henderson had a somewhat different, more earthy impression of the move to Berkeley.

"… Paul [Segall] and Harry [Waitz] had been asked to leave [their residence at] Stony Brook [New York] because all kinds of exotic chemicals, namely drugs, had been found in the trunk of Harry's car. So him and Paul got into their Volkswagen minivan and went out west and set up something they called Fort Addison, in Berkeley, which[, just as before in New York], was a house full of girls. They all managed to get on welfare. Paul kept inviting me out there, he said he could arrange for Diane and me to get on welfare and live there. But Diane took one look at Fort Addison and all the girls, and decided that that was not going to be. That was a little later, when we finally got out there."

The building that housed the first Trans Time, Inc. facility in Emeryville, CA. Photo by Mike Darwin. Photo Credit: CH6.

Back to the Rileys: the son continued to press Curtis for a "residence" for his frozen father, which would require a storage capsule as well.

"So I said to Art, 'this guy's got plenty of money, why don't you rent a facility, you need a truck with a hydraulic lift'—I gave him a whole list of things to get. And I said, now I'm going after that tank. I got a friend of mine [John Bull] and we rented a truck with a hydraulic lift. And the guy is going along with this. There's a feeling of unreality because every place he went [was] with these credit cards and $100 bills, and we'd been starving, and now we're renting trucks, and a private plane—he was like Howard Hughes. So we went to [New] Jersey [to obtain the unused capsule from the Dostal relatives], and he was going to give [Mrs.] Dostal['s daughter] $5,000 in cash for that tank. He's counting out the money, and of course, I was there for the $1,500 she still owed me for the dry ice.

"Then he said he wanted me to come with him to California. I was working in a record factory and Diane's saying to me, 'You lose this job over cryonics and I'm leaving you.' Women were constantly telling me things like this—like, 'if we get out of this alive you're never going to see me again.' So I told the guy, my wife and my youngest kid have to come to California with us. And he says, don't worry about a thing, he'd pay for everything. He got the body, he got the tank, bribed somebody at Kennedy to get it on a plane or something, I don't know.

"We got to Berkeley, to Paul Segall and his commune, and this guy gave him the credit cards to go out and buy food and so on. You have no idea how unreal all this was. We got all the stuff together, made a cart with wheels to move the tank—and that's how Trans Time got created. And sometimes, when I see Art Quaife writing about how single-handedly, from one room, he started Trans Time, I feel—well…Paul and Harry provided all the labor, and this guy was feeding them from McDonald's. They rented a place; they took the tank in there."

For a little subsequent history: Paul Segall and Harold Waitz were long active in Trans Time. Segall directed a well-publicized series of experiments with hamsters to demonstrate recovery of function in mammals after cardiac arrest and partial

Interior of the Trans Time, Inc. facility in Berkeley California in 1981. The dewar wrapped in black plastic at the right of the photo above contained the patient Mr. Riley. Photo by Mike Darwin. Photo Credit: CH6.

The first two Trans Time patients (1974, including Mr. Riley) immediately prior to the dewar being hoisted into an upright position for cooldown to liquid nitrogen temperature. Photo by Jim Yount. Photo Credit: CH6.

Paola Timiras; photo credit: http://crea.berkeley.edu/paola_s_timiras_profile.shtml, accessed 15 Nov. 2013.

freezing. In 1986 the company gained further publicity with Segall's dog, Miles, who was cooled to near the ice point and then revived. Miles and his owner were shown on the Phil Donahue Show, and cryonics was widely advertised and debated. In 1990 Segall and associates formed the biotech company BioTime which produced the widely-used blood-replacement product Hextend. In 2000 Segall with Dr. Timiras formed the Center for Research and Education on Aging (CREA) at UC Berkeley. Paul Segall deanimated in 2003 and was cryopreserved at Trans Time. Harold Waitz continues to work for BioTime. Bruce Cohen after working with BioTime gravitated toward Alcor and for many years now has lived near that organization's headquarters in Scottsdale, where he frequently attends meetings and has given much volunteer assistance on cases and, as a locksmith, with the security system.[6]

THE MELTDOWN IN NEW JERSEY

Mr. Riley's son, with his ready cash, helped to activate one cryonics organization (Trans Time, California) when another (CSNY, New York) was moribund and unsuitable. His mother was also frozen by Trans Time a few years later, then an accident claimed him and, not having provided arrangements or funding for himself, he was not cryopreserved. Funding eventually ran low for his parents and they were converted to neuropreservation. Presently their cryopreservations continue at Alcor.

Less fortunate were two other cases, who, like the patients at Robert Nelson's facility in Chatsworth, were thawed and lost. Nicholas DeBlasio had his wife Ann frozen at CSNY when she died of cancer in January 1969; later he became dissatisfied with the storage arrangements. In September 1971, using funds from a malpractice suit involving the death of his wife and with the help of Nelson he constructed a small, underground facility at the Mt. Holiness Cemetery in Butler, New Jersey. In it he placed the upright "Forever Flask" holding Ann. Late in 1972 a second patient was added, this one frozen by Nelson in California. For several years things went well but finally the capsule failed and the now-decomposing patients were removed and buried. Actually it is clear that at least one and likely two failures occurred before the final abandonment. The March 1979 *Immortalist*, newsletter of the Michigan-based Cryonics Association (CA, affiliated with the Cryonics Institute) reports:

"Mrs. DeBlasio was frozen [actually, encapsulated at liquid nitrogen temperature after being previously frozen to dry ice temperature] in August of 1969 by Cryo-Span Corporation and kept for a time on the premises of a Long Island cemetery; later she was moved to the New Jersey facility of Cryonic Interment Inc., an underground room in a cemetery similar to the Cryonic Interment facility [in Chatsworth,] near Los Angeles. [Cryonic Interment was a sister organization to the Cryonics Society of California as was Cryo-Span to CSNY. These for-profit, sister organizations handled the actual details of patient cooldowns and storage for the membership, nonprofit organizations they serviced.] Since then, Mr. DeBlasio has taken over the facility on a private basis.

"An accident caused a vacuum leak in August of 1978, resulting in considerable difficulty and expense to ship the unit to repair facilities; this was done with the help

From left: Paul Segal, Harold Waitz, both about 1979; Photo credit: Mike Darwin, private communication, 23 Mar. 2011.

Miles and Segall at the Trans Time laboratory, Oakland, CA, about 1987.[7] Photo credit: Peter Menzel.

of John Bull, a long-time cryonicist and present CA member.

"The storage room measures 8 x 16 feet and has one MVE [Minnesota Valley Engineering] unit; Mr. DeBlasio says it could hold five, and he would share it with others who would share the expense.

"The expenses are not yet entirely clear, but we have asked Mr. DeBlasio, and will put him in touch with anyone who expresses interest."[8]

It appears no one had such an interest, or in any case nothing came of it. It appears that the "accident" preceded the gruesome incident reported by Curtis Henderson below, since he is not mentioned. That failure must have happened soon after, about May the following year, if what seems to be one confirming source is understood correctly.[9] In any case the capsule was failing and attempted repairs were inadequate. Curtis remembered it as follows.

Bruce Cohen at Alcor, 2012 (photo by Mike Perry)

"I hadn't heard from John Bull or DeBlasio for a couple of years. One day I get a phone call, and they tell me they need me. Well, relations hadn't been good. I was always out there taking the risks. This time, I thought, it's going to be different.

"They told me the tank holding DeBlasio and [the other patient] is leaking, and can I get out there and help them? So I went out to Mount Holiness cemetery, and there it was. Nelson's idea had been to buy a number of cemetery plots and build a concrete vault underground. So now the bodies are buried in a cemetery and it's supposedly all legal. This one in Jersey was really nothing but a concrete well with a wooden hatch over it. And it was half-full of ground water, rain water, whatever. They had a big back-hoe pulling the tank out of the ground, with vapor hissing out all over the place. It looked like they were launching a missile. What had gone wrong was, instead of topping up the tank with nitrogen themselves, they contracted with a delivery service from General Dynamics.

"Now, even if you keep a tank in a very dry room, water vapor forms like a rind of ice around the top of the tank. But these people knew nothing about liquid nitrogen, nothing about cryogenics. They didn't know that you had to gently work the lid off, for fear of putting a hole in the vacuum jacket. I'm sure the delivery man got there, and the tank was covered with ice, and he gave it a good swift kick to knock the lid off, and he put a hole in the vacuum jacket. So the thing goes like Mount Vesuvius. …

"Anyhow, they hauled it up, and Bull has this big truck. He was in the vending machine business. So we got it in the back of his truck, and the thing is roaring; the vapor is boiling off. We pull out onto the highway, and he says, suppose the cops stop us. And I've got a grin on me, and I say, 'It's all yours, John.'

"So we got this mess to John's house up here in Medford in this truck and I still didn't realize it wasn't [Clara] Dostal in the tank with DeBlasio's wife. [Mrs. Dostal, who had been frozen by CSNY in December 1972, had by then been returned to her relatives who, unknown to Curtis, had her buried rather than transferred to another facility.] It was some woman from California who Nelson froze. Later on, her son was the one who paid Mike Darwin to come here and give her a decent funeral. At that time, Mike was desperate for a tank, but that was later on [in July 1980].

"First of all, Bull wants to pull into my house, but my wife [Diane] came running out and she's going to call the police immediately if we attempt to get those bodies out of the tank there. So, we went to Bull's house. Meantime, they'd built a giant dry-ice box and they were going to put both bodies in it. Now there's the job of getting the bodies out of the tank. This was impossible. They had thawed out, been refrozen and were frozen in place. So then they got the bright idea they were going to melt them by putting a garden hose in there. That turned the whole inside into solid ice. I mean, it was like *The Three Stooges*. Anyway, I told them, there's nothing to do but let it melt. And we had to wait about two days for it to do that in the truck outside John Bull's house, not far from here. [Curtis's residence at 9 Holmes Court, Sayville, L.I.]

"The stretcher wouldn't come out, nothing would come out. So I got the wrenches and crawled into this tank. DeBlasio's wife was in pretty good shape, but the other woman, whoever she was,

was nothing but a puddle at the bottom of the tank. So, we finally got `em out and put `em in the dry-ice box. Afterwards, I went upstairs to the bathtub and I had a pint of vodka. I drank the pint of vodka and I soaked for a day up there, and I could still smell it. And Diane burned my clothes. Anyway, Bull sent the tank to be repaired by some place in Jersey. DeBlasio was cheap; he wouldn't send the tank to MVE to get it properly fixed."

This evident carelessness led to further horrific consequences.

"I didn't hear from them for a while. Another year went by. I get a call from Mike Darwin, and he tells me the thing has melted down again. They had fixed it and put it all back in there. Mike says it's melted down and he's made this deal to come and get the tank, and DeBlasio's agreed to have his wife buried. … [The other patient too would be buried.] Mike came and I met him in a motel, we went out to Mount Holiness, and he had contacted a funeral parlor in Brentwood. It looked just like the Addams Family mansion. And here's Gomez, and the woman with the long black dress. And I mean his name *really was Gomez!* [Victor Gomez, who would later assist with other cases in the area under happier circumstances.] Anyway, Mike put the tank behind the funeral parlor in a Ryder rental truck, and we said there's nothing you can do, you got to wait till it melts, no matter how bad it stinks. And it stank, believe me. I told them there was no way I was going back in one of them tanks with them bodies in there in *that* condition. No way! So this time Mike went in and got the bodies out. And he got his tank. [Mike would sell the tank, which his Indianapolis-based organization Soma, Inc. received in return for services rendered, to Trans Time. He would use the proceeds for moving his organization and its sister organization, the Institute for Advanced Biological Studies or IABS, to California, where he soon would become Alcor's president.[10]] He was staying over at my house [with another Soma official, Joe Allen, who assisted with the operation] while he was doing all this."

Ann DeBlasio's dewar being hoisted out of the vault in Mt. Holiness Cemetery in Butler, New Jersey, in July 1980. The two decomposed and refrozen bodies inside were thawed one last time then removed and buried and the capsule was cleaned out and sent to Trans Time. From left: John Bull, Nick DeBlasio and the two cemetery workers who operated the backhoe. Photo by Mike Darwin.Photo Credit: CH6.

Further details of the 1980 cleanup are given in a report in the March 1981 *Cryonics* by Mike Darwin, where he notes that a breathing apparatus with an outside oxygen supply was necessary to enter the tank.[11] The heroic efforts of Mike and others at least averted a public scandal such as accompanied a similar meltdown at Nelson's facility in Chatsworth. I quote the last, painful, eloquent paragraph from Mike's article:

"I cannot know what motivated the freezing of these two people in the first place. I presume they were loved and needed. I find it difficult to understand how they could have been, with time, handled so carelessly. Perhaps there is a lesson for us there about human nature, love, need and the passage of time. For the hundredth time it must be said and said yet again that we cannot rely on friends or relatives, not even on loving, caring relatives, to maintain us in suspension. The passage of time, one way or another, may rob us even of those. The agonizing thing for me about this most recent loss is that it represents the first time to my knowledge that two people have thawed out and lost their chances not because of lack of money, but because of lack of sense." (As terrible and tragic as this failure was, it is important to note that it was caused basically by poor judgment or "lack of sense" rather than any willful malfeasance or criminal intent.)

SAUL KENT, CRYONICS SUCCESS STORY

Along with Curtis Henderson, no one was so important to New York cryonics as Saul Kent. As CSNY wound down its operations, Saul shifted his focus and eventually, location, becoming arguably the most influential cryonicist of all time.

Mike Darwin preparing to remove the bodies from the MVE dewar in July 1980. Photo by Joe Allen. Photo credit: CH6

From 1975 to 1980 he lived in Woodstock, about 100 miles north of New York City. During this time and on either side of it he wrote three books: *Future Sex* (1974), *The Life Extension Revolution* (1983), and *Your Personal Life Extension Program* (1985).[12] In 1980 he relocated to Hollywood, Florida, where he teamed up with Steven Ruddel to publish *Antiaging News.*[13]

At this point Kent wanted to do more than just publish but Ruddel was reluctant and Kent lacked funding to proceed on his own. In the area, however, was another life-extension enthusiast, Bill Faloon, a licensed mortician who then worked with the Neptune Society to arrange cremations and scattering of one's ashes at sea. Inspired by hopes to actually try to do something about aging, Faloon, against the advice of others, quit his job and joined with Kent to found the Life Extension Foundation, which would specialize in dietary supplements to promote health and longevity. Contrary to some expectations the enterprise flourished and profits have been used over the years to both fund research and assist operations related to cryonics, as well as more conventional life extension. (One reason for the success was acquisition of a mailing list from Dirk Pearson and Sandy Shaw, who authored a 1982 bestselling book, *Life Extension.*[14]) In particular Alcor has benefited greatly from LEF's financial contributions, along with research enterprises such as 21st Century Medicine and the cryonics-assistance organization, Suspended Animation, Inc. Here it is not possible to adequately cover even a small part of Saul Kent's efforts,

The young Saul Kent with mother Dora. (Photo credit: Saul Kent)

including controversies, but I mention one initiative, the Timeship Project, which appropriately enough involves someone in New York.[15]

The brainchild of Saul Kent and Bill Faloon, the yet-to-be finished Timeship Project is to be "the world's first comprehensive facility devoted to life extension research and cryopreservation." Selected for the work was Stephen Valentine, a renowned New York City architect. Valentine first met Kent at a 1990 cryonics gathering in New York. The first concept for a Timeship facility was completed in 1997, then the work was placed on hold until 2000, when a cryopreservation protocol using vitrification was developed and, with this optimistic prospect, the time seemed right to press ahead. Since then a site for the main structure has been selected (near Comfort, Texas), land has been acquired (in 2007), and now extensive renovations, upgrades are being done at the property as the master plan is being prepared. Valentine offers some thoughts:

"My goal was to integrate a bold symbolic vision with optimal functionality. I wanted to make this facility and its property the epitome of beauty and careful design. Timeship will be a scientific mecca for life extension research. Our plans include the cryopreservation of the DNA of both humans and endangered animal species. We will serve as a major research center for the cryopreservation of organs for transplantation, including bioengineered organs for which there is currently no real method of storage, and of course, thousands of human patients who wish to travel to the future. The facility makes use of sacred geometry to include symbolic themes of birth and re-birth as demonstrated throughout history. I believe that anyone encountering this building should experience these concepts viscerally. The building will enclose 700,000 square feet, some of it underground, and will cost an estimated $375 million. Much thought and planning has gone into its security both from natural and man-made threats. The property will also include a place for guests to stay when they visit, as well as conference facilities. There will also be land within the research park for other biotech companies."[16]

FURTHER HIGHLIGHTS AND CLOSING[17]

Curtis Henderson for decades lived at his modest residence in Sayville, Long Island. His commitment to cryonics never wavered, though he no longer did freezings or spent a lot of time over organizational matters. Though his finances were meager, for a time at Alcor in the 1980s he enjoyed a special, free arrangement due to his past contributions, courtesy of then-president Mike Darwin. In the 1990s there was a split in Alcor and another organization, CryoCare was formed. Some of the people who had been important in early New York cryonics, among them Saul Kent, Mike Darwin, and Curtis Henderson, now affiliated with this organization. A few years later the split healed and most of the "secessionists" rejoined Alcor. Curtis Henderson instead joined the Cryonics Institute (mainly for financial reasons) though maintaining friendly relations with Alcor personnel and visiting us from time to time. On June 25, 2009, at age 82, he became CI's 95th patient.[18] I remember Curtis had an ambition to write a book on his early cryonics experiences and wanted me to help, which I was happy to do. Events outpaced us, but I've often thought that the book can still be written, when reanimation technology permits….

As for the New York area, a close study of newsletters and other sources will show modest but definite cryonics activity covering the time gap from the 1970s up to now. There is not time or space to report in detail here, but I note a very few highlights.

A New York City chapter of the Michigan-based Cryonics Association, CANYC, was formed and the first meeting held on July 22, 1979, chaired by and held at the home of Arthur McCombs, on Madison Ave. *The*

Curtis Henderson in 1992 with the CC-101, the first capsule made for human cryogenic storage though never used as such, manufactured by Cryo-Care Equipment Corp. in Phoenix, Arizona in 1965. (This organization was different from the California-based CryoCare that existed in the 1990s.) In the back yard of Curtis's home at 9 Holmes Court in Sayville, LI, NY. Photo by Charles Platt. Photo Credit: CH6.

Immortalist, newsletter of the Michigan group (still in publication and now titled *Long Life*) notes "a high proportion of New York area cryonicists [were] in attendance, including such honored veterans as Curtis Henderson, Nicholas DeBlasio, Saul Kent and John Bull."[19] (Arthur would later join Alcor and was prominent in the organization around the time of the crisis that developed when Dora, the mother of Saul Kent, was frozen in 1987. A coroner's attempt to autopsy this patient was thwarted by court action, and she remains cryopreserved.) Meetings in the New York area continued; at one of them Stephen Valentine was introduced to the Timeship concept as noted. I remember

Ed Kuhrt with wife Anne

Curtis trying to reactivate CSNY in the 1990s and something of the sort occurred, though only as a discussion group, which appears to have been short lived.

As for cryonics cases in the New York area, a few notable ones can be mentioned. In 1996 Henrietta Popper was cryopreserved by CryoCare. For this case the mortician Victor Gomez performed heroically, working after midnight to expedite shipping the patient to California for storage with minimum delay.[20] (Popper eventually became an Alcor patient.) In 1997 Ed Kuhrt, a former CSNY member who joined Alcor in the 1980s, was cryopreserved.[21] Then there was Curtis Henderson who now rests at CI as noted.

In summary, the history of cryonics in New York, particularly in its early phases, forms an essential component of the larger history of the movement. Often the early attempts to cryopreserve people ended badly but the lessons taught by these bitter experiences, along with similar occurrences elsewhere, led to a stronger, more robust cryonics effort that has a greater chance of completing its mission. Some of the early players are still active. Others were unfortunately lost, or dropped out. But others are now cryopreserved, and we care for them with an eye toward future medicine and an attitude of wait-and-see. ■

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Abbreviations as indicated are used in note references.

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TP2 (Timeship Project). : http://hplusmagazine.com/2013/10/09/cryonics-and-immortality-visionary-an-interview-withstephenvalentine-of-timeship/, accessed 12 Dec. 2013.

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1. Background on cryonics patients either of CSNY or dealt with by Curtis Henderson will be found in previous *For The Record* columns on New York cryonics, particularly *Cryonics* Aug. 2013, 18-22. See MD for Mike Darwin's recounting of his efforts to persuade Mr. Riley, Jr., to have his father stored by Trans Time. Quotations of Curtis Henderson in the present article are from CH6.
2. CR Sep. 1968, 171; Oct. 1968, 186.
3. BC.
4. PS, 22-23.
5. BC; BT; PS 24-28.
6. BB2, BC, BT1, BT2, CP, MB, PT, personal recollections.
7. Peter Menzel, private communication 26 Nov. 2013; see also images M885/0007 and M885/0018, http://www.sciencephoto.com/search?subtype=keywords&media_type=images&matchtype=exact&searchstring=segall , accessed 18 Nov. 2013.
8. "From Nicholas DeBlasio…," IM Mar. 1979, 2.
9. "MVE Capsule Failures," IM May 1979, 5. The "second MVE failure" appears to be the same capsule as the first (note 8) though the article does not say so. But I am not aware of any other failure of an upright cryonics capsule at this time—RMP.
10. In addition to CH6 see "IABS and Soma Moving to Los Angeles," CM Mar. 1981, 1.
11. Michael Darwin, "A Question of Time," CM Mar. 1981, 4-6.
12. These titles, with more information, may be found at amazon.com.
13. Much of the information in this and the following paragraph comes from Saul Kent, private communication, Oct. 26, 2013.
14. BB1
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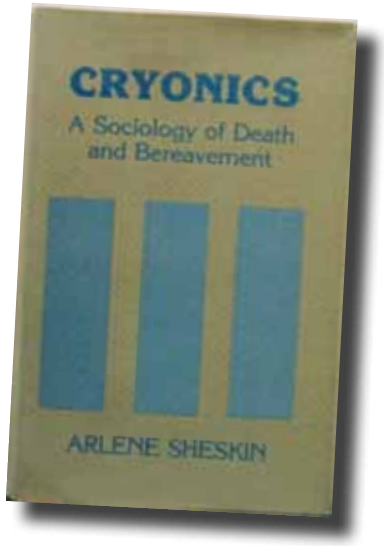
LESSONS LEARNED FROM *CRYONICS: A Sociology of Death and Bereavement*

By Aschwin de Wolf

Arlene Sheskin's *Cryonics: A Sociology of Death and Bereavement* was published in 1979, 15 years after the publication of Robert Ettinger's *The Prospect of Immortality* but before the consolidation and growth of the major cryonics organizations. As a consequence, this study focusses on a relatively small sample of people in a field that was still struggling to create a sound infrastructure to do cryopreservations. While the focus of the book is to examine the world of cryonics, and how it affects the people involved in it (or relatives of cryopreserved people), what I am most interested in is what we can learn about the sustainability of cryonics organizations. A more detailed review of the book with an emphasis on the history of cryonics in New York was published by Mike Perry in *Cryonics* magazine, November 2013.

A central theme that comes up frequently in *A Sociology* is that it is difficult to keep a cryonics organization running without having patients to care for. At the same time, the organizations featured in the book are not yet equipped to conduct professional cryopreservations or have the financial resources to provide secure and long-term maintenance. As a consequence, maintenance of cryopreserved patients often involves periodic requests for money from relatives to keep the patient in cryopreservation. Because cryonics organizations did not have a good understanding of what it would cost to keep patients cryopreserved for long-term care it was not possible for these organizations to provide reliable estimates, necessitating going back to the relatives for additional funding. This often produced resentment among relatives and reinforced the impression that cryonicists were only in it for the money. This perception of profiteering was a major source of frustration for the people involved who had often sacrificed a lot of their own time and money without noticeable progress. One could argue that the "Chatsworth scandal" in 1979, when 9 cryonics patients were discovered to be thawed in Chatsworth, California, prompted cryonicists to insist on much sounder financial controls and requirements and this started a much more robust era for cryonics.

The movement away from the pay-as-you-go system cannot be overestimated in the history of cryonics. One interesting question is whether the practice of "grandfathering" that was honored by Alcor until quite recently was still a remnant of the old area. After all, if many patients do not upgrade their life insurance policies to reflect existing (or future) costs, an organization can still find itself in a situation where expenses will exceed income and the maintenance of patients will become problematic. As I write this, there is still no broad consensus on how to adequately deal with cryopreservation costs and inflation and what to communicate to members. If anything is clear from Sheskin's book (and recent Alcor member feedback), it is that members do not like unexpected changes and increases in dues and cryopreservation minimums. One solution to this is to let cryopreservation minimums rise on an annual (or biannual) basis. This allows the cryonics organization to respond to cost increases in a transparent and predictable manner while also allowing the member to anticipate and plan for the future costs of cryonics.



Requiring sound financial funding from members is necessary for a sustainable cryonics organization but is not sufficient. Also important is *ownership* of the building where the patients are being cared for. There are multiple accounts in Sheskin's book where cryonics organization officials found themselves forced out of buildings and in conflict with landlords over having patients on their premises. Even if money was available to keep patients in cryopreservation, keeping them in rented facilities (ranging from warehouses to mortuaries) presented formidable logistical and financial challenges, sometimes ending in burial of the patient or transfer to another (poorly run) organization. No doubt most of the people involved in the early days recognized the importance of facility ownership but raising the money to acquire a building was not a trivial thing. In fact, one could argue that the lack of funding to purchase a building for dewar maintenance is one of the major reasons why there are not more cryonics organizations *right now.*

It also draws attention to the importance of not giving up on a cryonics facility once acquired, even if the organization itself is dysfunctional. Today there are still locations in the US where patients can be legally stored but the organizations or companies occupying these premises have stopped accepting new members or have moved to other kinds of business, so this topic is still quite relevant.

One pseudonymous individual in Sheskin's book, identifiable as Curtis Henderson, puts it this way:

"Cryonics is not something a whole bunch of people can do. We put out the newsletter—a propaganda sheet—and got involved in the actual freezing of bodies. There's only a limited number of people who can participate, there just wasn't that much going on." (p. 57)

This situation changed somewhat in the 1980s and 1990s when Alcor had enough members to organize local meetings and organize training sessions, but the fact that cryonics organizations are held together by only a small group of committed individuals remains a cause for concern. Strangely enough, the tendency of cryonics organizations such as Alcor to rely more on staff members and medical professionals has again left most members with little to do besides paying dues and reading the organization's magazine. I think this is a potential problem for sustaining a viable organization and the transfer of knowledge that is necessary to maintain a high level of care. If the current trend to reduce member involvement in cryonics procedures persists, cryonics organizations will need to think hard about how to keep their members involved through other means.

One of the most perceptive observations of Sheskin is that it is possible to separate the concept of cryonics from the success of the organizations that offer it:

"[T]he problems of cryonics could be attributed to individuals or particular cryonics organizations, thus allowing belief in the practice to remain separate from, and unchallenged by, the practices or vicissitudes of particular cryonics organizations." (p. 40)

In the extreme, all cryonics organizations could fail and their patients thaw out, but future generations will develop the molecular technologies that *would* have been sufficient to restore many of these patients to good health. In addition, there *is* a non-trivial number of people who think that cryonics will work but are not motivated to make cryonics arrangements for themselves. By introducing Associate Membership Alcor is making an effort to tap into the support for cryonics without requiring people to make cryonics arrangements (right away) as a condition for joining the organization. This option makes it clear that Alcor is serious about its tax-exempt status to educate the general public and seek support for human cryopreservation in general. It also helps to convey the important point that cryonics is not just an option for individuals to serve their own interests but that we want to develop and make this option available for all people who need and want it.

A more difficult problem is how to permanently engage members. As Sheskin recognizes, successful social and religious movements often offer a whole range of activities and benefits for their members. In many cases, people are drawn to these movements *because* of these benefits. It would be artificial for a cryonics organization to bundle cryonics services with "something else" solely for the sake of increased membership involvement or membership recruitment. In fact, there is an increasing recognition that if we want to appeal to as many people as possible we should present cryonics as form of forward-looking critical care medicine, open to people of all persuasions.

There is one interest that all cryonics members have in common, however, that can inspire more member involvement and recruitment and that is life extension. If Alcor were known as an organization that not only offers cryonics arrangements, but also provides up-to-date, valuable information and tools to extend people's lives, applicants would feel much more that they have something to gain by joining *right now*. An ambitious effort to be perceived as the organization to go to for evidence-based life extension technologies could draw a lot more people to Alcor. A (potential) member will not feel that his (financial) contributions are solely aimed at an event in the distant future but will start reaping benefits on an ongoing basis by joining the organization.

There is another advantage of Alcor providing members tools to extend their lives. If Alcor became known as an organization that makes strong efforts to help their members to *prevent* their having to be cryopreserved, (hostile) outsiders will no longer claim that Alcor aims to benefit from the "death" of their members.

In closing, Sheskin's book still contains important lessons and clues about growth for today's cryonics organizations:

1. Cryonics is not sustainable on a pay-as-you-go third-party basis, and proper paperwork and sound funding (life insurance, living wills etc.) should be a requirement for making cryonics arrangements.

2. Cryonics organizations should require inflation-proof, but predictable, funding (even the practice of "grandfathering" can destabilize an organization and confuse members).

3. Secure ownership of a cryonics facility is of crucial importance for a sustainable cryonics organization.

4. A cryonics organization should offer members (and relatives of patients) means to remain involved with the organization.

5. The only logical service that a cryonics organization can offer to (potential) members without compromising its broad appeal is state-of-the-art knowledge and tools to extend life. This should not only be offered as a benefit, but can be a major draw for people to want to join the organization. ■

That `70s Transhumanism

By Mark Plus

***Cosmic Trigger, Volume I: Final Secret of the Illuminati,* by Robert Anton Wilson. Las Vegas: New Falcon Publishers. First Edition published in 1977. ISBN 1-56181-003-3.**

A BOOK REVIEW OF *COSMIC TRIGGER, VOLUME I: FINAL SECRET OF THE ILLUMINATI*

"When I was a child, I spake as a child, I understood as a child, I thought as a child: but when I became a man, I put away childish things." 1 Corinthians 13:11

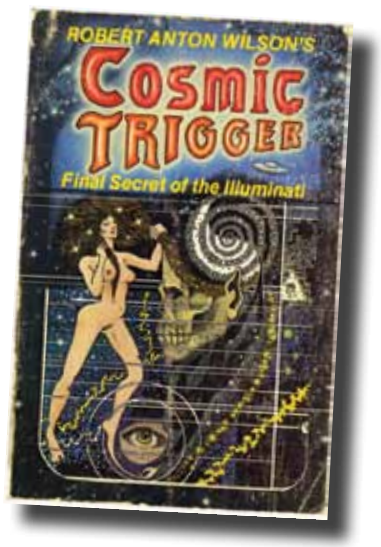
I have to admit to feeling nostalgia about "childish things" from rereading this nonfiction book of "What ifs" by Robert Anton Wilson, who died in 2007. I read it the first time in my freshman year of college in 1978, when I had joined the L-5 Society and shared in the enthusiasm for Gerard K. O'Neill's space colonization proposals which peaked in popularity late in that decade. The quest for radical life extension seems to complement the quest for colonizing space, considering that both ventures seek to overcome natural limits, and eventually several prominent L-5ers, notably Keith Henson, showed up in the cryonics movement in the 1980s and 1990s as well.

Wilson in *Cosmic Trigger* writes about some of the things which interested me at the time, and which still do, mainly space colonization, radical life extension and cryonics, given their respective states in the 1970s. He also apparently knew some of that decade's cryonics activists, notably Paul Segall, and the surviving cryonicist old-timers who read those passages of his book may recognize a few names. I did not understand the appeal of Wilson's adventures in drug experimentation and occult play-acting, however, even if Wilson himself found them so fascinating and insightful.

And from hindsight I also do not understand the crush Wilson apparently had on Timothy Leary, who figures prominently in Wilson's personal philosophy in *Trigger*. The glowing portrayal of Leary makes me wonder if Wilson wrote the book in part to defend Leary's reputation in the drug culture in response to rumors in the 1970s that Leary had agreed to a morally compromising deal with the Feds in exchange for reduced prison sentences. I got to meet Leary a couple times in the early 1990s because he had cryopreservation arrangements with Alcor (he canceled all such arrangements right before he died), and he would host Alcor's Turkey Roasts in his home in Beverly Hills. I just did not experience Leary as the vivacious and fascinating personality propagandized by Wilson, though by the time I saw him, senescence, an irregular lifestyle and illness had taken their toll. The episode with Leary gave me my first inkling that bohemians probably do not age well.

Wilson covers material which would normally go by names of "fringe weirdness" and the like, and I have to withhold judgment on much of that because I have not experienced anything like it myself. But he also makes claims about the part of reality which the rest of us can observe and evaluate, namely, predictions published in the 1970s that we would have attained breakthroughs in radical life extension and human cryopreservation by right about now.

For example, on p. 118, Wilson recounts his visit circa 1973 to Leary in the prison at Vacaville, California, where Wilson writes:



The most important events of the next three decades, Leary predicted, will be the invention of an immortality pill . . . .

Tim forecasted the longevity pill in Terra II, *published in January 1973, saying it would appear around 1980. One month later, in February, Michigan State University released the information that they were researching a pill that might extend life to 200 years. In April, Dutton published* The Immortality Factor *by Osborn Segerberg, Jr., which reviews current research on aging and predicts a life-extension pill by 2000 or so.*

Dr. Leary doesn't insist that a literal immortality formula will be found that quickly, of course. Rather, he feels that extension of life to around 400 years is most probable; then, those who live a few centuries will acquire further medical technology expanding life into millennia, hundreds of thousands of years, millions . . .

"I expect to be alive when the solar system has

burned up 5½ billion years from now," he said happily. "Nobody in this generation has to die, unless they want to."

How has that "immortality" worked out for Leary lately?

Wilson later describes on pp. 120-124 and 126-130 the "Immortalist Underground" which he says existed in the 1970s, and which seemed concentrated in the Bay Area. These then-youthful scientists drew inspiration from Robert Ettinger's book, *The Prospect of Immortality,* published in the previous decade, and sought ways to decelerate or reverse the aging process, with the (lack of) results we can see all around us now. Wilson references more predictions of imminent breakthroughs in life expectancy and even "immortality" from these scientists writing in the 1960s and 1970s, again fixed to dates which have already come and gone.

Wilson then throws out some more speculations on pp. 214-218 which made me laugh, after the nonsense surrounding the so-called "Mayan Apocalypse" on December 21, 2012. According to Wilson, apparently the McKenna brothers, Terrence L. and Dennis J., developed a computer model based on some dubious math derived from the *I Ching,* and their program predicted that "everything goes jackpot around A.D. 2012." Wilson quotes the McKenna brothers:

in the last 135 minutes, 18 such barriers (i.e., barriers comparable to the appearance of life, the invention of language or the achievement of immortality [Wilson's note]*), will be crossed, 13 of them in the last 75 X 10^{-4} seconds.*

Gee, where have I heard something like that before?

Wilson's description of Leary's speculations about eight "brain circuits" on pp. 197-206 also has not aged well. Supposedly the first four of these "circuits" activate in humans for dealing with terrestrial life; while the "circuits" numbered V through VIII turn on in response to certain drugs (marijuana, LSD, peyote, etc.) and mystical or occult practices, and they exist to run human life in our allegedly destined migration off the planet and into space colonies and starships, where we will commune with other advanced (and apparently drug-tripping) intelligences who had developed to that stage ahead of us.

Very well. Could Leary or Wilson have shown us in a textbook of neuro-anatomy where to find these "higher circuits" in the brain? And why would humans have these alleged "circuits" conveniently lying inside our heads which make us adapted for living in outer space, when just about everything else in the body does not work efficiently in free fall? We know now that prolonged weightlessness causes a variety of illnesses in the human body which astronauts do not always fully recover from when they return to Earth, not to mention the damage inflicted by exposure to cosmic rays. Perhaps Leary and Wilson did not know about these hazards in the 1970s, but the facts do not support Leary's teleology about alleged "brain circuits" for helping us to survive in an extraterrestrial environment humans did not evolve in and which cannot support human life in general. Wilson's credulity about Leary's pseudo-neuroscience shows how infatuation with a celebrity can sabotage judgment about the celebrity's questionable pronouncements. And in general Wilson depends on popular writings for his claims instead of trying to discuss them intelligently by reading textbooks or the scientific literature to see what they have to say about them.

Wilson ends *Cosmic Trigger* with an account of the murder of his teenage daughter Luna Wilson on October 3, 1976, and how his friends raised money to have Luna's brain cryopreserved by the TransTime company in the Bay Area. Apparently Luna became the first charity cryonics case, about 30 years before the Venturists assumed the role of raising money for people in similar situations. TransTime in the 1970s occupied a spot in the world of cryonics comparable to Alcor's today, yet it has since fallen into obscurity because infighting between the people who ran it and the members of the affiliated Bay Area Cryonics Society left TransTime in a weakened state. I gather that TransTime still exists, but my efforts to contact anyone there—including by letter and by telephone—have not generated a response.

So this raises the question of what happened to Luna Wilson's brain. Has TransTime kept it cryopreserved all these years? And if so, where did the long-term funding come from? [1]

Assuming that Luna's brain has stayed cryopreserved and that it can remain that way in case it becomes revivable someday, Luna will face what many people confronted with the cryonics idea consider the deal-breaker and the best excuse to reject cryopreservation for themselves: "But she wouldn't know anyone in The Future!" Worse yet, she would come back to life with no expectation from before her murder that she would wind up cryopreserved and then revived possibly centuries later, though she might have known about cryonics because of her father's friendship with cryonics activists in the 1970s. Luna's mother, Arlen, died in 1999, while Wilson, as I indicated above, died in 2007; and as far as I know, neither parent went into cryopreservation in an attempt to accompany their daughter across time. Eventually everyone who knew Luna through the end of her first life cycle nearly 40 years ago will have died as well. Who, then, would want to assume the responsibility of looking out for her interests?

Aschwin de Wolf has recently pointed out the need to maintain the social visibility and identities of the people in cryopreservation, and if Luna Wlison's brain has stayed cryopreserved, then she deserves this consideration as much as any other cryonaut. I would like to see the establishment of a tradition in the cryonics movement where we form what I call "asymmetric friendships," for want of a better term, where living cryonicists in effect "friend" our colleagues in cryopreservation, even ones we did not know. If we lay the groundwork now, when we go into cryo ourselves, future generations of cryonicists will accept the responsibility of "friending" all previous cryonauts, ourselves included, during our time of vulnerability, and their successors will do so in turn etc., so that if and when the revivals happen, the revived cryonauts will discover benefactors waiting for them who will help them to have soft landings into their new lives. We would certainly want to welcome Luna into that community of asymmetric friendships. The emergence of a culture of trans-temporal relationships might turn into something analogous to the Christian practice of "apostolic succession," where the cryonicists alive in, say, the year 2113 can trace the transmission of their commitment to cryonauts' welfare to the cryonicists alive now.

To sum up, Wilson does not use the word "transhumanism" in *Cosmic Trigger,*

but some of the people he writes about advocated ideas which clearly fall into that category now, including Timothy Leary with his prophecies of an imminent breakthrough in life extension. I had a sense of *déjà vu* from reading this book again after 35 years, because today's transhumanists make similar claims about impending "immortality," only they realize that they would sound foolish now to say that we "conquered aging" or became "immortal" in 1980, 2000 or 2012. Instead they have rescheduled the year when "everything goes jackpot," as Wilson phrases it, to something like 2045.

Yet the people who make these kinds of forecasts miss an apparently nonobvious point: You cannot test the effectiveness of an "anti-aging" or "life extension" technology in humans any faster than the rate at which humans happen to live—and humans in their natural state can already live decades longer than most other mammals. In other words, we have no way of knowing if a longevity breakthrough has happened until a whole lot of people live well past 120 years, and in good physical and cognitive shape. That rules out having any such knowledge in this century because every year between now and 2100 falls within current human life expectancies. [2] A baby born in 2013 could live to see her 87th birthday in 2100, but we have 87 year old people around now without having to postulate anything science fiction-like to account for their longevity.

I find it sad that so many transhumanists suffer from the delusion that they live in the privileged generation which will witness revolutionary transformations in the human condition, including radically extended lives for themselves, instead of allowing for more likely scenarios: (1) They will age, sicken and die on schedule, like Leary and Wilson; (2) The cool things they want to see might not happen for several more centuries; or (3) Many of these things may never happen anyway; or worse, they cannot happen because they make scientifically wrong assumptions. Wilson fell into this trap when he writes on p. 218:

By the turn of the next century, then, we will be a completely new species in many dimensions: living in space, not on a planet; able to program our nervous systems for any degree of any function we wish; possessing a lifespan in centuries, and well on our way to immortality. Between 2000 and 2012, if the McKenna scenario can be trusted, the real Cosmic Action will begin.

Delete the part about "the turn of the next century" and add about 40 years to the dates in the above paragraph, and it could pass for a recent post on one of the transhumanist internet forums predicting when "the real Cosmic Action will begin."

Cosmic Trigger supports my impression that the cryonics community would do well to keep the case for cryonics separate from the wider transhumanist "philosophy," if you could call it that given its apparent lack of wisdom to love. Compare 1970s transhumanism with today's, and it still sounds like an adolescent fad which promotes irresponsible beliefs about the next 20-30 years and resists maturing into an adult world view.

The field of cryonics, by contrast, has had opportunities for some time now to develop into a form of experimental medicine which can make progress in the here and now, based on existing science and technology, and without having to associate it with science fiction, speculative futurology, or in Wilson's case, altered states of consciousness. We can also state realistic ambitions for cryonics by saying that human cryopreservation has the goal of trying to turn death from a permanent off-state into a temporary and reversible off-state through applied neuroscience and biotechnology. This avoids the problems of the transhumanist way of describing cryonics as a means to turn us into "immortal supermen." Cryonics simply does not need the "cryonics and something else" burden which people like Wilson have wanted to impose upon it for several decades already; and if anything, these "something elses" have proven counterproductive.

The people who run cryonics organizations or represent the community could further gain credibility and status in mainstream society by emphasizing cryonics as a 300 year project instead of a 30 year project, and then acting accordingly, because the "immortality in 30 years" predictions coming from transhumanists who try to link these claims to cryonics become embarrassing when the people who make them, like Robert Anton Wilson and Timothy Leary, die according to actuarial expectations.

Or as wise elders have said for generations, people judge you by the kinds of friends you have. The companions you enjoyed as a teenager do not necessarily serve you well when you become an adult and want to earn the respect of other adults—and if you want high-status adults to take you seriously, you would not want to list people like Robert Anton Wilson and Timothy Leary as character references on your résumé, much less as intellectual influences. Until transhumanists start to show signs of maturation and a reality-orientation in their thinking and conduct, instead of repeating the same childish follies from one generation to the next, cryonicists would act prudently to keep a discreet distance from their company to avoid discredit and ridicule by association. ■

ENDNOTES

[1] The website of the Cryonics Institute has an undated but apparently old article by Art Quaife about Luna Wilson's cryopreservation. I have not found anything recent about her disposition: http://www.cryonics.org/luna.html

[2] Physicist Michio Kaku understands this point as well. Refer to my review of his book, Physics of the Future: http://www.alcor.org/magazine/2011/08/30/physics-of-the-future/

Preserving Minds, Saving Lives: 35 Years of the Best Cryonics Writing of The Alcor Life Extension Foundation

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VASCULAR BENEFITS OF A Mediterranean Diet

VALIDATED IN HUGE NEW STUDY

A large, rigorous study published in the ***New England Journal of Medicine*** confirmed the health benefits of those who switch to a **Mediterranean diet** rich in **omega-3 fish oil** as well as protective nutrients called polyphenols found in **olive oil**, fruits, vegetables, nuts like walnuts, and wine.[1] The study ended early because the benefits were so overwhelming, with startling benefits for vascular health, that it was considered unethical to continue to deprive the control group.[1]

In addition to the health-promoting benefits of vegetables and fruits with their abundance of polyphenol nutrients, the Mediterranean Diet group took at least **4 tablespoons** of polyphenol-rich extra-virgin **olive oil** a day.[1]

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Olive oil contains polyphenol nutrients that have demonstrated wide-ranging health benefits.[3-5] The recommended twice daily dose of **Super Omega-3** supplies a similar polyphenol content to that found in **4 to 6 tablespoons of olive oil.**

References

1. *N Engl J Med.* 2013 Feb 25.
2. *Crit Rev Food Sci Nutr.* 2007;47(7):651-73.
3. *Altern Med Rev.* 2007 Dec;12(4):331-42.
4. *Curr Top Med Chem.* 2011;11(14):1767-79.
5. *Med Glas (Zenica).* 2012 Feb;9(1):1-9.
6. Available at: http://www.ifosprogram.com/consumer-reports.aspx. Accessed March 18, 2013.
7. *J Nutr Sci Vitaminol (Tokyo).* 2003 Aug;49(4):270-6.

CAUTION: If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult your healthcare provider before taking this product.

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The Fifth Annual *Young Cryonicists* Gathering

Teens & Twenties 5 2014: Getting to Know You - You Getting to Know Each Other

Fri-Sun; April 4-6, '14 Deerfield Beach FL Host: *Life Extension Foundation* SCHOLARSHIPS AVAILABLE

★★★

Greetings to *Young Cryonicists*,

You are receiving this invitation because you are among the future leaders in cryonics.

All attention will be focused on:
our getting to know you and
you getting to know each other.
PLUS: an update on the latest emergency response technologies and revival strategies.

Who is Eligible?

Fully signed up young cryonicists from all cryonics organizations in their late teens through age thirty *(17-30) as of April 10, 2014* - may apply to attend.

Younger Cryonicists With Parent(s)

Twelve through sixteen year olds may attend when accompanied by their parent(s) or guardian.

Parents/guardians of attendees aged 17-19 are also encouraged to accompany their child. All attending parents will be put in touch with each other should they choose to have their own "get together" during the "young cryonicists" gathering.

Program

Some individuals are social butterflies. This is not so for everyone. And we want *everyone to meet everyone.* Therefore, I have designed a diverse range of "getting to know you" activities. *If* you would enjoy participating in these various getting acquainted activities, *then* this is for you.

Enjoy this exciting & fulfilling weekend.

SCHOLARSHIPS:

Life Extension Foundation, through a generous education grant, is offering *40 scholarships* that pay for ALL of the following:

- U.S. airfare to/from South Florida (or up to $1000 for origin outside the U.S.)
- Hotel accommodations for Friday and Saturday nights
- Meals and beverages on Friday night, all day Saturday, and Sunday breakfast and lunch
- Registration fee - $350 - also covered

Please go to this website for a full packet with all details and application forms:

http://www.alcor.org/YC5.pdf

Forever,

Cairn Erfreuliche Idun
Founder/Director: T2

PS Come Early. Stay Late.

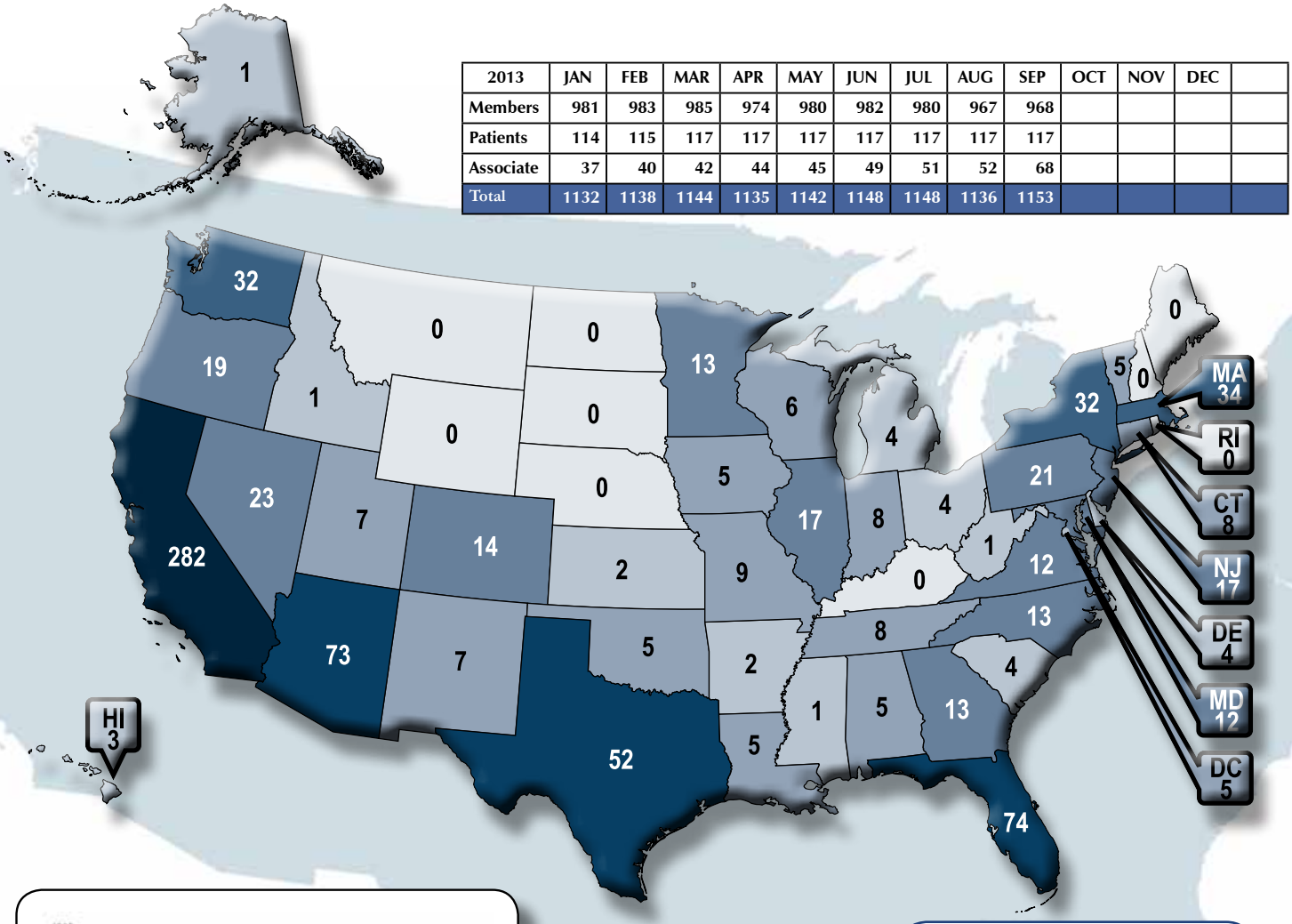
Some attendees to T2 enjoy spending *extra time in Florida* - especially since their flight is already paid for via their scholarship.

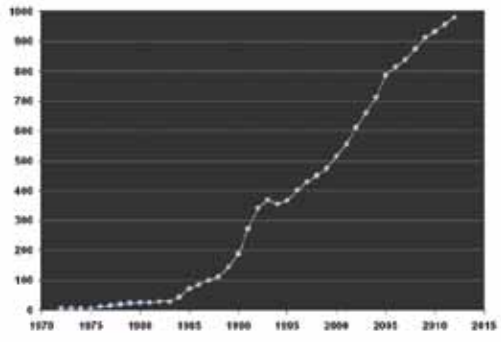
This is at their own expense for additional lodging and food.

I look forward to getting to know you.

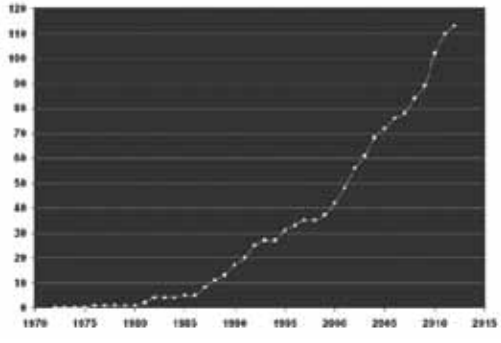
Membership Statistics

2013	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
Members	981	983	985	974	980	982	980	967	968				
Patients	114	115	117	117	117	117	117	117	117				
Associate	37	40	42	44	45	49	51	52	68				
Total	1132	1138	1144	1135	1142	1148	1148	1136	1153				





Number of Alcor members



Number of Alcor patients

- 0 Members
- 1–4 Members
- 5–9 Members
- 10–24 Members
- 25–49 Members
- 50–74 Members
- 75+ Members

International

Country	Members	Patients
Aruba	1	0
Australia	13	0
Canada	40	1
Denmark	1	0
Germany	4	0
Israel	1	0
Italy	1	0
Lebanon	1	0
Luxembourg	1	0
Mexico	4	0
Monaco	2	0
Netherlands	2	0
New Zealand	2	0
Norway	1	0
Portugal	4	0
Spain	2	0
Thailand	3	0
United Arab Emirates	1	0
United Kingdom	21	0
TOTAL	**105**	**1**

Delayed Aging Is Better Investment than Cancer, Heart Disease Research

On the heels of an announcement from Google that the company's next startup, Calico, will tackle the science of aging, a new study showed that research to delay aging and the infirmities of old age would have better population health and economic returns than advances in individual fatal diseases such as cancer or heart disease. With even modest gains in our scientific understanding of how to slow the aging process, an additional 5 percent of adults over age 65 would be healthy rather than disabled every year from 2030 to 2060, revealed the study in the October issue of Health Affairs. Put another way, an investment in delayed aging would mean 11.7 million more healthy adults over age 65 in 2060. The analysis, from top scientists at USC, Harvard University, Columbia University, the University of Illinois at Chicago and other institutions, assumes research investment leading to a 1.25 percent reduction in the likelihood of age-related diseases. In contrast to treatments for fatal diseases, slowing aging would have no health returns initially, but significant benefits over the long term.

Suzanne Wu / USC News
7 Oct. 2013
http://news.usc.edu/#!/article/55969/delayed-aging-is-better-investment-than-cancer-heart-disease-research/

A Staff of Robots Can Clean and Install Solar Panels

In a dusty yard under a blistering August sun, Rover was hard at work, lifting 45-pound solar panels off a stack and installing them, one by one, into a concrete track. A few yards away, Rover's companion, Spot, moved along a row of panels, washing away months of grit, then squeegeeing them dry. But despite the heat and monotony—an alternative-energy version of lather-rinse-repeat—neither Rover nor Spot broke a sweat or uttered a complaint. They could have kept at it all day. That is because they are robots, surprisingly low-tech machines that a start-up company called Alion Energy is betting can automate the installation and maintenance of large-scale solar farms. Working in near secrecy until recently, the company, based in Richmond, Calif., is ready to use its machines in three projects in the next few months in California, Saudi Arabia and China. If all goes well, executives expect that they can help bring the price of solar electricity into line with that of natural gas by cutting the cost of building and maintaining large solar installations.

Diane Cardwell / New York Times
14 Oct. 2013
http://www.nytimes.com/2013/10/15/business/energy-environment/putting-robots-to-work-in-solar-energy.html?partner=socialflow&smid=tw-nytimesbusiness

Researchers Advance toward Engineering "Wildly New Genome"

In two parallel projects, researchers have created new genomes inside the bacterium E. coli in ways that test the limits of genetic reprogramming, opening new possibilities for increasing flexibility, productivity and safety in biotechnology. "The first project is saying that we can take one codon, completely remove it from the genome, then successfully reassign its function," said Marc Lajoie, a Harvard Medical School graduate student in the lab of George Church. "For the second project we asked, 'OK, we've changed this one codon, how many others can we change?'" Of the 13 codons chosen for the project, all could be changed. "That leaves open the possibility that we could potentially replace any or all of those 13 codons throughout the entire genome," Lajoie said. The results of these two projects appeared Oct. 18 in Science. The work was led by Church, Robert Winthrop Professor of Genetics at Harvard Medical School and founding core faculty member at the Wyss Institute for Biologically Inspired Engineering.

Jake Miller / Harvard Medical School
17 Oct. 2013
http://hms.harvard.edu/news/radical-recoding-10-17-13

Biological Clock Able to Measure Age of Most Human Tissues

Everyone grows older, but scientists don't really understand why. Now a UCLA study has uncovered a biological clock embedded in our genomes that may shed light on why our bodies age and how we can slow the process. Published in the Oct. 21 edition of the journal *Genome Biology*, the findings could offer valuable insights to benefit cancer and stem cell research. While earlier biological clocks have been linked to saliva, hormones and telomeres, the new research is the first to result in the development of an age-predictive tool that uses a previously unknown time-keeping mechanism in the body to accurately gauge the age of diverse human organs, tissues and cell types. Unexpectedly, this new tool demonstrated that some parts of the anatomy, like a woman's breast tissue, age faster than the rest of the body. "To fight aging, we first need an objective way of measuring it. Pinpointing a set of biomarkers that keeps time throughout the body has been a four-year challenge," said Steve Horvath, UCLA professor of human genetics and the predictive tool's inventor.

Elaine Schmidt / UCLA Newsroom
21 Oct. 2013
http://newsroom.ucla.edu/portal/ucla/ucla-scientist-uncovers-biological-248950.aspx

Hair Regeneration Method is First to Induce New Human Hair Growth

Researchers at Columbia University Medical Center (CUMC) have devised a hair restoration method that can generate new human hair growth, rather than simply redistribute hair from one part of the scalp to another. The approach could significantly expand the use of hair transplantation to women with hair loss, who tend to have insufficient donor hair, as well as to men in early stages of baldness. The study was published today in the online edition of the Proceedings of the National Academy of Sciences (PNAS). "About 90 percent of women with hair loss are not strong candidates for hair transplantation surgery because of insufficient donor hair," said co-study leader Angela M. Christiano. "This method offers the possibility of inducing large numbers of hair follicles or rejuvenating existing hair follicles, starting with cells grown from just a few hundred donor hairs. It could make hair transplantation available to individuals with a limited number of follicles, including those with female-pattern hair loss, scarring alopecia, and hair loss due to burns."

ScienceDaily
21 Oct. 2013
http://www.sciencedaily.com/releases/2013/10/131021104242.htm

MD Anderson Taps IBM Watson in Battle Against Cancer

Not just a Jeopardy! winner, IBM's Watson has now joined the battle against cancer. According to a recent announcement from the University of Texas MD Anderson Cancer Center and IBM, the Houston, Texas-based medical center is using the IBM Watson cognitive computing system for its mission to eradicate cancer. The two organizations will leverage Watson's computing power to help clinicians uncover insights from MD Anderson's patient and research databases. The technology is designed to integrate the knowledge of MD Anderson's clinicians and researchers, and to advance the cancer center's goal of treating patients with the most effective, safe and evidence-based standard of care available, officials say. "One unique aspect of the MD Anderson Oncology Expert Advisor is that it will not solely rely on established cancer care pathways to recommend appropriate treatment options," said Lynda Chin, M.D., professor and chair of genomic medicine and scientific director of the Institute for Applied Cancer Science at MD Anderson.

Rajiv Leventhal / Healthcare Informatics
October 22, 2013
http://www.healthcare-informatics.com/news-item/md-anderson-taps-ibm-watson-battle-against-cancer

Companies Rush to Build 'Bio-Factories' for Medicines, Flavorings and Fuels

Scientist Jack Newman's biotech company Amyris is creating new organisms, most forms of genetically modified yeast, at the dizzying rate of more than 1,500 a day. Some convert sugar into medicines. Others create moisturizers that can be used in cosmetics. And still others make biofuel, a renewable energy source usually made from corn. "You can now build a cell the same way you might build an app for your iPhone," said Newman. Some believe this kind of work marks the beginning of a third industrial revolution—one based on using living systems as "bio-factories" for creating substances that are either too tricky or too expensive to grow in nature or to make with petrochemicals. The rush to biological means of production promises to revolutionize the chemical industry and transform the economy, but it also raises questions about environmental safety and biosecurity and revives ethical debates about "playing God." Hundreds of products are in the pipeline.

Health & Science / Washington Post
24 Oct. 2013
http://www.washingtonpost.com/national/health-science/companies-rush-to-build-biofactories-for-medicines-flavorings-and-fuels/2013/10/24/f439dc3a-3032-11e3-8906-3daa2bcde110_story.html

Vicarious AI passes First Turing Test: Reads CAPTCHAs

Vicarious, a startup developing artificial intelligence software, announced Oct. 27 that its algorithms can now reliably solve modern CAPTCHAs, including Google's reCAPTCHA, the world's most widely used test of a machine's ability to act human. A CAPTCHA scheme is considered broken if an algorithm is able to reach a precision of at least 1%. By leveraging core insights from machine learning and neuroscience, the Vicarious AI achieves success rates up to 90% on modern CAPTCHAs from Google, Yahoo, PayPal, Captcha.com, and others. This advancement renders text-based CAPTCHAs no longer effective as a Turing test. "Recent AI systems like IBM's Watson and deep neural networks rely on brute force: connecting massive computing power to massive datasets. This is the first time this distinctively human act of perception has been achieved, and it uses relatively minuscule amounts of data and computing power. The Vicarious algorithms achieve a level of effectiveness and efficiency much closer to actual human brains," said Vicarious co-founder D. Scott Phoenix.

Vicarious.com
27 Oct. 2013
http://news.vicarious.com/post/65316134613/vicarious-ai-passes-first-turing-test-captcha

Synaptic Transistor Learns While It Computes

It doesn't take a Watson to realize that even the world's best supercomputers are staggeringly inefficient and energy-intensive machines. Our brains have

upwards of 86 billion neurons, connected by synapses that not only complete myriad logic circuits; they continuously adapt to stimuli, strengthening some connections while weakening others. We call that process learning, and it enables the kind of rapid, highly efficient computational processes that put Siri and Blue Gene to shame. Materials scientists at the Harvard School of Engineering and Applied Sciences (SEAS) have now created a new type of transistor that mimics the behavior of a synapse. The novel device simultaneously modulates the flow of information in a circuit and physically adapts to changing signals. Exploiting unusual properties in modern materials, the synaptic transistor could mark the beginning of a new kind of artificial intelligence: one embedded not in smart algorithms but in the very architecture of a computer. The findings appear in Nature Communications.

Harvard School of Engineering and Applied Sciences
1 Nov. 2013
http://www.seas.harvard.edu/news/2013/11/synaptic-transistor-learns-while-it-computes

Findings May Lead to New Tissue Cryopreservation Methods

Researchers have gained new information about the processes that promote freezing of cells within tissues, which could ultimately lead to novel approaches for preventing tissue injury during cryopreservation, they report in the Nov. 5 issue of the *Biophysical Journal* (open access), a Cell Press publication. Developing an efficient way to freeze and store living tissues could transform many aspects of medical care and research, but ice crystallization often occurs within cells during such cryopreservation procedures, leading to cell death. A long-standing obstacle to avoiding tissue damage during freezing is that when cells are joined together within tissues, individual cells are more likely to crystallize than if the cells are kept apart. "In tissues, ice crystals are thought to be able to grow through membrane channels called gap junctions, thus allowing ice to easily propagate from cell to cell," explains senior author Dr. Jens Karlsson, of Villanova University. "But the results of the present study indicate that the mechanism of tissue cryo-injury is much more complex than was previously thought."

Kurzweil AI
6 Nov. 2013
http://www.kurzweilai.net/findings-may-lead-to-new-tissue-cryopreservation-methods-for-grafts-and-organ-transplantations

Crispr Technique Heralds Gene Editing Revolution

A breakthrough in genetics—described as "jaw-dropping" by one Nobel scientist—has created intense excitement among DNA experts around the world who believe the discovery will transform their ability to edit the genomes of all living organisms, including humans. The development has been hailed as a milestone in medical science because it promises to revolutionize the study and treatment of a range of diseases, from cancer and incurable viruses to inherited genetic disorders such as sickle-cell anemia and Down syndrome. For the first time, scientists are able to engineer any part of the human genome with extreme precision using a revolutionary new technique called Crispr, which has been likened to editing the individual letters on any chosen page of an encyclopedia without creating spelling mistakes. The technique is so accurate that scientists believe it will soon be used in gene-therapy trials on humans to treat incurable viruses such as HIV or currently untreatable genetic disorders such as Huntington's disease.

Steve Connor, Science Editor, Independent
7 Nov. 2013
http://www.independent.co.uk/news/science/exclusive-jawdropping-breakthrough-hailed-as-landmark-in-fight-against-hereditary-diseases-as-crispr-technique-heralds-genetic-revolution-8925295.html

Novel Genetic Patterns May Make Us Rethink Biology and Individuality

Professor of Genetics Scott Williams, PhD, of the Institute for Quantitative Biomedical Sciences (iQBS) at Dartmouth's Geisel School of Medicine, has made two novel discoveries: first, a person can have several DNA mutations in parts of their body, with their original DNA in the rest—resulting in several different genotypes in one individual—and second, some of the same genetic mutations occur in unrelated people. We think of each person's DNA as unique, so if an individual can have more than one genotype, this may alter our very concept of what it means to be a human, and impact how we think about using forensic or criminal DNA analysis, paternity testing, prenatal testing, or genetic screening for breast cancer risk, for example. Williams' surprising results indicate that genetic mutations do not always happen purely at random, as scientists have previously thought. His work, done in collaboration with Professor of Genetics Jason Moore, PhD, and colleagues at Vanderbilt University, was published in *PLOS Genetics* journal on November 7, 2013.

Geisel School of Medicine at Dartmouth / Eurekalert!
7 Nov. 2013
http://www.eurekalert.org/pub_releases/2013-11/tgso-drf110713.php

Researchers Regrow Hair, Cartilage, Bone, Soft Tissues

Young animals are known to repair their tissues effortlessly, but can this capacity be recaptured in adults? A new study from researchers at the Stem Cell Program at Boston Children's Hospital suggests that it can. By reactivating a dormant gene called Lin28a, which is active in embryonic stem cells, researchers were able to regrow hair and repair cartilage, bone, skin and other soft tissues in a mouse model. The study also found that Lin28a promotes tissue repair in part by enhancing metabolism in mitochondria—the energy-producing engines in cells—suggesting that a mundane cellular "housekeeping" function could open new avenues for developing

regenerative treatments. Findings were published online by the journal *Cell* on November 7. "Efforts to improve wound healing and tissue repair have mostly failed, but altering metabolism provides a new strategy which we hope will prove successful," says the study's senior investigator George Q. Daley, MD, PhD.

Boston Children's Hospital
7 Nov 2013
http://www.eurekalert.org/pub_releases/2013-11/bch-rrh110713.php

IBM to Announce More Powerful Watson via the Internet

On Nov. 14 IBM will announce that Watson, the computing system that beat all the humans on "Jeopardy!" two years ago, will be available in a form more than twice as powerful via the Internet. Companies, academics and individual software developers will be able to use it at a small fraction of the previous cost, drawing on IBM's specialists in fields like computational linguistics to build machines that can interpret complex data and better interact with humans. IBM's move to make its marquee technology more widely available is the latest effort among big technology companies to make the world's most powerful computers as accessible as the Angry Birds video game. It is also an indication of how quickly the technology industry is changing, from complex systems that cost millions to install to pay-as-you-go deals that provide small companies and even individuals access to technology that just a few years ago only the largest companies could afford. "The next generation will look back and see 2013 as a year of monumental change," said Stephen Gold, vice president of the Watson project at IBM.

Quentin Hardy / New York Times
13 Nov. 2013
http://www.nytimes.com/2013/11/14/technology/ibm-to-announce-more-powerful-watson-via-the-internet.html?_r=0

Turning Nanoparticles into Complex Nanostructures

Animal and plant cells are prominent examples of how nature constructs ever-larger units in a targeted, preprogrammed manner using molecules as building blocks. In nanotechnology, scientists mimic this "bottom-up" technique by using the ability of suitably structured nano materials to "self-assemble" into higher order architectures. Applying this concept, polymer scientists from Bayreuth, Aachen, Jena, Mainz, and Helsinki have recently published an article in the prestigious journal *Nature* that describes a new principle for the self-assembly of patterned nanoparticles. This principle may have important implications for the fundamental understanding of such processes as well as future technologies. The research team is headed by Professor Axel Muller. The research was conducted at the University of Bayreuth and funded by the German Research Foundation (DFG) within the Collaborative Research Center 840 "From Particulate Nano-Systems to Mesotechnology." The self-assembly process described in *Nature* begins with chain-like macromolecules called triblock terpolymers.

Nano Daily
14 Nov. 2013
http://www.nanodaily.com/reports/Team_succeeds_in_organizing_programmed_nanoparticles_into_highly_complex_nanostructures_999.html

Novel Gene Therapy Works to Reverse Heart Failure

Researchers at the Cardiovascular Research Center at Icahn School of Medicine at Mount Sinai have successfully tested a powerful gene therapy, delivered directly into the heart, to reverse heart failure in large animal models. The new research study findings, published in November 13 issue of *Science Translational Medicine*, is the final study phase before human clinical trials can begin testing SUMO-1 gene therapy. SUMO-1 is a gene that is "missing in action" in heart failure patients. "SUMO-1 gene therapy may be one of the first treatments that can actually shrink enlarged hearts and significantly improve a damaged heart's life-sustaining function," says the study's senior investigator Roger J. Hajjar, MD. "We are very eager to test this gene therapy in our patients suffering from severe heart failure." Heart failure remains a leading cause of hospitalization in the elderly. It accounts for about 300,000 deaths each year in the United States. Heart failure occurs when a person's heart is too weak to properly pump and circulate blood throughout their body.

Mt. Sinai Hospital, School of Medicine / Eurekalert!
15 Nov. 2013
http://www.eurekalert.org/pub_releases/2013-11/tmsh-ngt111113.php

MEETINGS

ABOUT THE ALCOR FOUNDATION

The Alcor Life Extension Foundation is a nonprofit tax-exempt scientific and educational organization dedicated to advancing the science of cryopreservation and promoting cryonics as a rational option. Being an Alcor member means knowing that—should the worst happen—Alcor's Emergency Response Team is ready to respond for you, 24 hours a day, 365 days a year.

Alcor's Emergency Response capability includes specially trained technicians and customized equipment in Arizona, northern California, southern California, and south Florida, as well as many additional certified technicians on-call around the United States. Alcor's Arizona facility includes a full-time staff, and the Patient Care Bay is personally monitored 24 hours a day.

ARIZONA

FLAGSTAFF:

Arizona without the inferno. Cryonics group in beautiful, high-altitude Flagstaff. Two-hour drive to Alcor. Contact eric@flagstaffcryo.com for more information.

SCOTTSDALE:

This group meets the third Friday of each month and gatherings are hosted at a home near Alcor. To RSVP, visit http://cryonics.meetup.com/45/.

AT ALCOR:

Alcor Board of Directors Meetings and Facility Tours—Alcor business meetings are generally held on the first Saturday of every month starting at 11:00 AM MST. Guests are welcome to attend the fully-public board meetings on odd-numbered months. Facility tours are held every Tuesday and Friday at 2:00 PM. For more information or to schedule a tour, call Marji Klima at (877) 462-5267 x101 or email marji@alcor.org.

CALIFORNIA

LOS ANGELES:

Alcor Southern California Meetings—For information, call Peter Voss at (310) 822-4533 or e-mail him at peter@optimal.org. Although monthly meetings are not held regularly, you can meet Los Angeles Alcor members by contacting Peter.

SAN FRANCISCO BAY:

Alcor Northern California Meetings are held quarterly in January, April, July, and October. A CryoFeast is held once a year. For information on Northern California meetings, call Mark Galeck at (408) 245-4928 or email Mark_galeck@pacbell.net.

FLORIDA

Central Florida Life Extension group meets once a month in the Tampa Bay area (Tampa and St. Petersburg) for discussion and socializing. The group has been active since 2007. Email arcturus12453@yahoo.com for more information.

NEW ENGLAND

CAMBRIDGE:

The New England regional group strives to meet monthly in Cambridge, MA—for information or to be added to the Alcor NE mailing list, please contact Bret Kulakovich at 617-824-8982, alcor@bonfireproductions.com, or on FACEBOOK via the Cryonics Special Interest Group.

PACIFIC NORTHWEST

Cryonics Northwest holds regular meetings for members of all cryonics organizations living in the Pacific Northwest.

For information about upcoming meetings and events go to: http://www.facebook.com/cryonics.northwest

A Yahoo mailing list is also maintained for cryonicists in the Pacific Northwest at http://tech.groups.yahoo.com/group/CryonicsNW/.

BRITISH COLUMBIA (CANADA):

The contact person for meetings in the Vancouver area is Keegan Macintosh: keegan.macintosh@me.com.

OREGON:

The contact person for meetings in the Portland area is Chana de Wolf: chana.de.wolf@gmail.com.

ALCOR PORTUGAL

Alcor Portugal is working to have good stabilization and transport capabilities. The group meets every Saturday for two hours. For information about meetings, contact Nuno Martins at n-martins@n-martins.com. The Alcor Portugal website is: www.alcorportugal.com.

TEXAS

DALLAS:

North Texas Cryonauts, please sign up for our announcements list for meetings (http://groups.yahoo.com/group/cryonauts-announce) or contact David Wallace Croft at (214) 636-3790 for details of upcoming meetings.

AUSTIN/CENTRAL TEXAS:

We meet at least quarterly for training, transport kit updates, and discussion. For information: Steve Jackson, 512-447-7866, sj@sjgames.com.

UNITED KINGDOM

There is an Alcor chapter in England. For information about meetings, contact Alan Sinclair at cryoservices@yahoo.co.uk. See the web site at www.alcor-uk.org.

If you are interested in hosting regular meetings in your area, contact Alcor at 877-462-5267, ext. 113. Meetings are a great way to learn about cryonics, meet others with similar interests, and introduce your friends and family to Alcor members!

What is Cryonics?

Cryonics is an attempt to preserve and protect human life, not reverse death. It is the practice of using extreme cold to attempt to preserve the life of a person who can no longer be supported by today's medicine. Will future medicine, including mature nanotechnology, have the ability to heal at the cellular and molecular levels? Can cryonics successfully carry the cryopreserved person forward through time, for however many decades or centuries might be necessary, until the cryopreservation process can be reversed and the person restored to full health? While cryonics may sound like science fiction, there is a basis for it in real science. The complete scientific story of cryonics is seldom told in media reports, leaving cryonics widely misunderstood. We invite you to reach your own conclusions.

How do I find out more?

The Alcor Life Extension Foundation is the world leader in cryonics research and technology. Alcor is a non-profit organization located in Scottsdale, Arizona, founded in 1972. Our website is one of the best sources of detailed introductory information about Alcor and cryopreservation (www.alcor.org). We also invite you to request our FREE information package on the "Free Information" section of our website. It includes:

- A fully illustrated color brochure
- A sample of our magazine
- An application for membership and brochure explaining how to join
- And more!

Your free package should arrive in 1-2 weeks. (The complete package will be sent free in the U.S., Canada, and the United Kingdom.)

How do I enroll?

Signing up for a cryopreservation is easy!

Step 1: Fill out an application and submit it with your $90 application fee.
Step 2: You will then be sent a set of contracts to review and sign.
Step 3: Fund your cryopreservation. While most people use life insurance to fund their cryopreservation, other forms of prepayment are also accepted. Alcor's Membership Coordinator can provide you with a list of insurance agents familiar with satisfying Alcor's current funding requirements.
Finally: After enrolling, you will wear emergency alert tags or carry a special card in your wallet. This is your confirmation that Alcor will respond immediately to an emergency call on your behalf.

Not ready to make full arrangements for cryopreservation? Then **become an Associate Member** for $10/month (or $30/quarter or $120 annually). Associate Members will receive:

- *Cryonics* magazine by mail
- Discounts on Alcor conferences
- Access to post in the Alcor Member Forums
- A dollar-for-dollar credit toward full membership sign-up fees for any dues paid for Associate Membership

To become an Associate Member send a check or money order ($10/month or $30/quarter or $120 annually) to Alcor Life Extension Foundation, 7895 E. Acoma Dr., Suite 110, Scottsdale, Arizona 85260, or call Marji Klima at (480) 905-1906 ext. 101 with your credit card information. You can also pay using PayPal (and get the Declaration of Intent to Be Cryopreserved) here: http://www.alcor.org/BecomeMember/associate.html

ALCOR
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For more than three decades, Life Extension has been at the forefront of the movement to support revolutionary anti-aging research that is taking us closer to our goal of extending the healthy human life span indefinitely. We inform our members about path-breaking therapies to help keep them healthy and alive.

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- Access to a toll-free phone line to speak with **knowledgeable health advisors,** including naturopathic doctors, nutritionists, and a cancer expert, about your individual health concerns. You can also receive help in developing your own personal life extension program.
- **Discounts on prescription drugs, blood tests, and pharmaceutical quality supplements** that will greatly exceed your membership dues. You'll receive a directory listing the latest vitamins and supplements, backed by scientific research and available through a unique buyers club.

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- ***Disease Prevention and Treatment* book** ($49.95 cover price)...this hardbound fourth edition provides novel information on complementary therapies for 133 diseases and illnesses—from Alzheimer's disease to cancer, from arthritis to heart disease—that is based on thousands of scientific studies.

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