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CRYONICS

AUGUST 2013 · VOLUME 34:8

CRYONICS WITHOUT REPAIR

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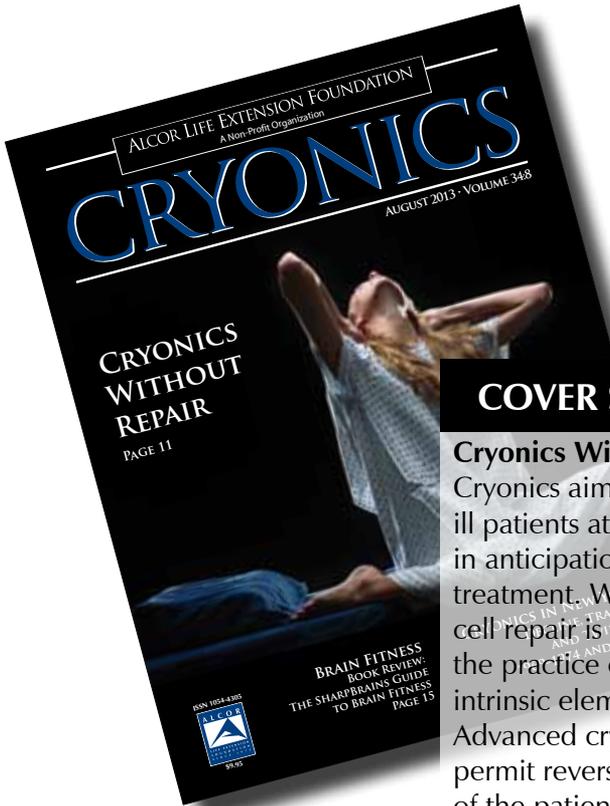
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CRYONICS



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Cryonics Without Repair

Cryonics aims to stabilize critically ill patients at low temperatures in anticipation of future medical treatment. While the concept of cell repair is often associated with the practice of cryonics, it is not an intrinsic element of the procedure. Advanced cryonics technologies will permit reversible cryopreservation of the patient. If human suspended animation were achieved cryonics would solely involve future treatment of the patient's disease and its underlying pathologies. Reversible cryopreservation is thus important and technical obstacles to making it a reality are identified.

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Cryonics magazine is published monthly.

To subscribe to the printed edition
and/or change your address, please call
480.905.1906 x101 or visit the magazine
website:
www.alcor.org/magazine

Please note: If you change your address less than
a month before the magazine is mailed, it may
be sent to your old address.

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ISSN: 1054-4305

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Letters to the Editor



Dear Sirs.

Re: The Valley of the Shadow of Death, Keegan Macintosh, Cryonics, June 2013, Vol 34:6

I am happy to note that Keegan Macintosh supports and gives a more or less scientific rationale for my plea to cryonicists to avoid the word “immortality.” And to not apply it to any discourse regarding our predictions for our future lifespans. My thinking is that the rational cannot and should not compete with the irrational. And I can think of nothing as iconic as the irrationality of “Immortality.” We do not even have a good “objective” definition of time, nor can we define with any certitude the dimensions of our universe. Neither can our concept of “Infinity” be defined as anything other than a place-holder to assuage our ignorance.

Furthermore, the religions are fully utilizing the word. In terms of Macintosh’s hypothesis, use of the word “immortality” will increase the tensions at the border of rational/irrational.

Let us all agree to stop stirring this particular pot and get on with the task of making our passion better known to those who do not share it—yet.

Thank you,
Dr. Robert Newport

Aschwin:

Regarding your *Quod Incepimus Conficiemus* column about “Marketing Cryonics” (June 2013), I got a chuckle from your characterization of the first, so-called transhumanist way of talking about cryonics which appeals mainly to certain kinds of geeks. I know that genre of blogs, internet forums and publications well.

Well, somebody had to say it. You have rightly identified the problem with burdening cryonics as part of a package deal with a lot of “something else’s” coming from other, independent agendas which many ordinary people might find off-putting. We can present the cryonics idea in the context of experimental medicine, the moving frontier of irrecoverable death and advances in applied neuroscience, without having to invoke the latest transhumanist fads like, say, friendly AI’s, avatars, predictions of becoming “immortal” by arbitrary dates in the 21st Century and such.

Unfortunately the cryonics idea’s association with transhumanist thinking goes back to the beginning. Robert Ettinger in his first book, *The Prospect of Immortality* (1964), includes speculations about enhancements of revived cryonauts in Chapter 9, “You, Better Than New,”* and in a few other places in that early exposition of the cryonics concept.

And then Ettinger goes all out with integrating cryonics into a transhumanist philosophy in his later book, *Man Into Superman* (1972); and as far as I can tell, he never disavowed this way of presenting the idea.

In his latter book, Ettinger even states explicitly** that cryonicists should aspire to become “immortal supermen”:

“It should be amply clear by now that the immortal superman represents not just a goal, but a way of life, a world-view only partly compatible with today’s dominant ideologies. We might call this fresh outlook the new meliorism, of which the cryonics or people-freezing program is an important current element.” [Emphasis added.]

By implication, this characterization of cryonics seems to denigrate the values of some people now in cryopreservation who expressed more modest goals, like a young cancer victim’s desire to “finish life” instead of hoping to come back in 300 years as an immortal cyborg woman, or something which sounds comparably science-fictional and foolish.

I have observed the cryonics scene since the 1980s, and it has become increasingly clear to me that the ways we’ve tried to explain and present the idea to the public, starting with Ettinger himself, have systematically failed. The cryonics idea has resisted effective communication for nearly 50 years now, and I think the time has come for us to acknowledge that some of the problems may lie in cryonics’s long-standing connections to the sorts of imaginary goals currently promoted in the name of “transhumanism.” Have we really tried to convey the meaning of the cryonics concept so that people with more mainstream interests and world views can understand and appreciate it?

Sincerely,
Mark Plus
A-1257

* <http://www.cryonics.org/1chapter9.html#You>

** http://www.cryonics.org/chap11_1.html

QUOD INCEPIMUS CONFICIEMUS



BORN TOO EARLY? By Aschwin de Wolf

A friend of mine in the life extension movement who is approaching age 65 once lamented that he might be part of the last generation that will not be able to take advantage of the rejuvenation biotechnologies that become available to the next generation. I wish I could believe him because it means that I may still be in time! Unfortunately, interest in anti-aging research and cryonics is rather low (to put it mildly), even among baby boomers who one might expect to be painfully aware of the aging process. It is rather disturbing to me that the aging process itself is not being identified as a source of misery, disease, separation, and oblivion. Then again, perhaps I am just too impatient and unable to see the larger picture.

The practical production of liquid nitrogen from liquefied air was first achieved by Carl von Linde in 1905, although liquid nitrogen only became widely available commercially after World War II. The idea of cryonics was introduced to the general public in the mid-1960s. Since liquid nitrogen (or liquid helium) is an essential requirement for human cryopreservation it is interesting to recognize that there was only a difference of roughly 20 years between cryonics being technically possible and the first efforts to

practice cryonics. Is this an outrageously long delay? I doubt anyone would argue this.

Similarly, while the idea of rejuvenation has always appealed to humans (think about Countess Elizabeth Bathory), I doubt anyone can credibly claim that there has been a long delay between our recognition of biological senescence and the desire to see aging as a biotechnological challenge to overcome. While there is no massive global movement to fight aging yet, the desire to conquer aging is as old as the exposition of (secular) modern evolutionary biology itself. Are we too impatient?

What is disappointing, however, is the widespread passive acceptance of aging and death by the majority of people. Thinking about this issue, it struck me that until recently our (educational) institutions and research programs were shaped by generations that were perhaps eminently amenable to accepting the inevitability of aging. Expecting these institutions and research programs to change their objectives overnight may not be completely realistic. It is undeniable, however, that the idea that aging is not something that is to be passively accepted but something that can be stopped and reversed is gradually winning more converts.

I suspect this observation will not provide much solace for my aging friend. But one of the nice features of cryonics is that it is possible to benefit from future rejuvenation technologies regardless of whether one happens to live to the time when such technologies become available. In fact, for some people that might be one of the most appealing reasons to make cryonics arrangements. Case in point, in my own situation I am not so much scared of death as I am fascinated by the idea of seeing the aging process reversed, not just for myself but for others, too. I cannot think of a greater human achievement than the introduction of effective, evidence-based, rejuvenation.

I am comfortable with the idea that I may not live to see rejuvenation biotechnologies becoming available before I am cryopreserved, provided I am able to take advantage of them later. Of course, I'd prefer to be there (without interruption!) when it happens. People may have *different* reasons to desire cryonics—we need to recognize this diversity of motives instead of just trying to “sell” the one reason that is important to us. Then perhaps, maybe, we can accelerate the identification of aging as a condition to be stopped. ■

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BOOTSTRAP PERSONHOOD (OR, CORPORATIONS ARE PEOPLE, TOO...)

By Keegan Macintosh



In my last article, I looked at some historical and contemporary examples of legal activism aimed at expanding legal personhood to beings not already included in that category. As much as it was a fairly superficial survey, some trends could still be ascertained, firstly (and not so surprisingly) that courts tend to preserve the status quo when faced with these hard questions, and secondly, that even when the decision is made to admit or recognize new persons, courts do not provide much in the way of guidance with regards to what qualities the beings possess that were necessary and sufficient to their recognition as persons. The groups of beings which have seen some successes suing for increased recognition as persons (slaves, women) have been ones capable of speaking for themselves—even if lawyers were hired to make the actual legal arguments. Advocates for unborn human fetuses and nonhuman animals have received answers from the courts more or less along the lines of “these beings asserted to be persons have never before been recognized as persons, therefore they are not persons,” leaving any potential for change to the political realm (probably at the constitutional level). Some intermediate recognition or protection was carved out for late-term fetuses in *Roe v Wade*, and this is probably the most relevant case for future cryonics personhood activism because the court there gave some explanation for this protection as being founded upon the

“potentiality of life” of the unborn fetus. So, if a cryonics personhood case were to rely on that particular precedent to argue that cryonics patients should receive some higher level of protection against unwanted interferences, I suspect the kind of proof required to substantiate their “potential” to live would be the resuscitation of a non-human animal from a cryopreserved state. Even then, the intermediate category carved out for cryonics patients may only extend so far as those humans who are preserved under the same or very similar circumstances to the experiment model, which may very well not include anyone preserved today.

simple truth that cryonics patients could really benefit from personhood, even if for no other reason than to hold assets that will otherwise be transmitted to next-of-kin or beneficiaries named in the patient’s will.

But haven’t we already solved that problem? Haven’t cryonics asset preservation trusts (or personal revival trusts, or reanimation trusts, or whatever name is currently in vogue), been developed for precisely this reason? Yes, they have, and with the abolishment of the rule against perpetuities in numerous jurisdictions these are a reasonably effective workaround to cryonics patients’ current lack of personhood. In a way,

“I am interested in exploring whether we could bootstrap personhood for our patients using the existing legal personhood of corporations.”

So, the prospects for suing for cryonics patient personhood, or partial personhood are, for the moment, poor. Political activism might have a better shot, considering that “personhood amendments” extending personhood to fetuses have at least managed to make it through state legislatures in the U.S., but it is hard to imagine an interest group as small as today’s cryonics movement managing to get that kind of traction—we simply don’t have enough votes for politicians to worry about winning. On the other hand, we have the

cryonics patients are not unlike some of the earliest users of trusts in English law—the Crusaders venturing off to faraway lands, whose future status as alive or dead was sufficiently uncertain that they felt it necessary to hand over their assets to trusted third parties to hold for the benefit of their families (and themselves, if they made it back alive), with some assurance that the law would recognize those beneficial entitlements.

But ultimately, the law only recognizes *persons* as possible beneficiaries (well, with

a few exceptions that cryonics patients don't really fit into), and for these trusts to work as intended our patients do still need to resume personhood at some point—upon resuscitation, if not earlier. What if, for some patients at least, revival doesn't proceed by “resuscitation” in the mechanical sense, or even “repair,” but through some kind of uploading scenario which results in a being rather different in form from the original? If such beings are not recognized as legal persons, or the *same* persons as were cryopreserved, then even if the trustees do what they are supposed to do and recognize these beings as the beneficiaries, they will not have legal capacity to hold title to the property, and this could significantly limit their ability to actually use and benefit from those assets. So are we assuming too much about the legal status of such future beings when we establish trusts that, for the moment, can only benefit “persons”? Perhaps not – arguably it might not even be ethical to revive cryonics patients into any format that was not on equal legal footing with what we call “persons” today. But on the other hand, maybe we are unnecessarily committing ourselves to fitting into particular socially constructed boxes.

I am interested in exploring whether we could bootstrap personhood for our patients using the existing legal personhood of corporations. The current “standard” setup for cryonics asset preservation trusts has the trustee(s) holding legal title to assets for some interim beneficiary that has the personhood status required of it by trust law, with the resuscitated cryonics patient written into the trust as a contingent beneficiary and intended ultimate recipient of the trust capital. The interim beneficiary could in theory be anyone, but the traditional wisdom is that the patient's cryonics organization is the safest choice, as being far less likely to seek to terminate the trust (which is something trust law allows beneficiaries to do under some circumstances).

In my model of cryonics patient corporate personhood, however, the patient incorporates a unique, incorporated “avatar” of themselves (named after them even) while still alive, to be the interim

beneficiary of their asset preservation trust while they are not a person.

service providers, patient care trusts, asset preservation trustees and institutions. While

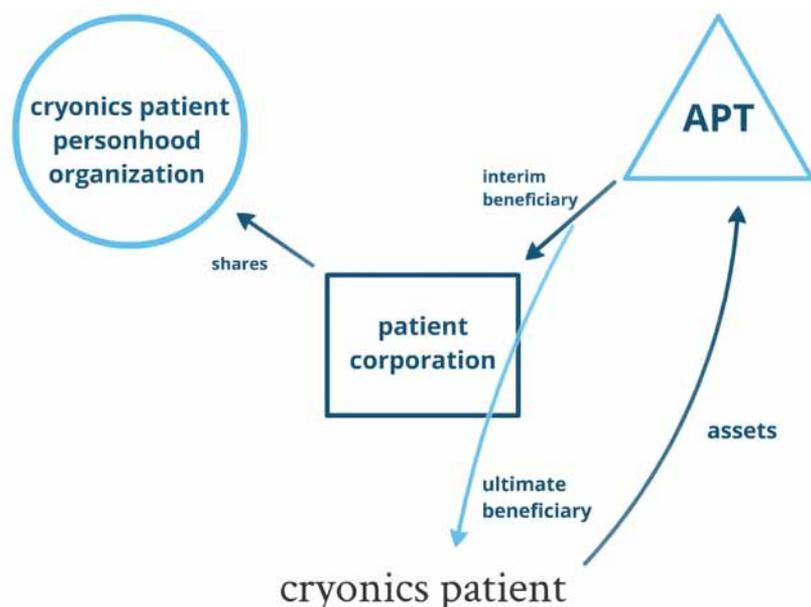
“After incorporating their patient corporations, the cryonicists transfer their shares, and thus ownership of their legal avatars to the personhood organization.”

Now hold on a moment, you should be asking yourself—if the patient incorporates a corporate avatar of themselves, they own that corporation by holding all of its shares, and when they die, those shares will pass to their next of kin or the residual beneficiaries of their will, who would then “own” the beneficiary of their asset preservation trust. So how would that solve anything?

Well, these cryonics patient corporate persons need to be propped up somehow, and to that end I am imagining a cryonics patient personhood organization, a non-profit organization formed expressly for the purpose of anchoring cryonics patients' corporate identities during their cryopreservation. After incorporating their patient corporations, the cryonicists transfer their shares, and thus ownership of their legal avatars to the personhood organization. The personhood organization would be independent of all the cryonics

the patient is neither recognized as a legal person nor able to speak for themselves, the personhood organization's only function is to perpetuate the existence of the patient corporations. Then, if the time comes that the patient is able to speak for themselves, but lacks personhood (i.e. the scenario I imagined above where “uploaded” beings are not recognized as persons, or the same kind of persons, as “natural” human persons), then the unalterable by-laws of the personhood organization direct it to operate the patient corporation on the revived patient's instructions. And, of course, if and when the patient's own natural personhood is recognized, the shares of the patient corporation will be transferred back to them—though by this time, its utility will have waned.

The personhood organization can serve as the anchor point for any number of patient corporations, and it would also fall within the mandate of such an



organization to advocate concurrently for recognition of “real” personhood for the patients, both before their resuscitation/revival, and after if necessary. The critically important feature of this model for cryonics patient personhood is that not only is the cryonicist-composed membership and directing mind of the personhood organization bound by unalterable provisions of the organization’s constating documents to perpetuate and operate the patient corporations according to the patients’ wishes, but also that they have a very strong incentive to do so because they will all be relying on the same mechanism to prop up their own personhood down the road.

similar precautions with the patients’ most precious assets—themselves?

When I presented this idea for cryonics patient corporate personhood at the Institute for Evidence Based Cryonics symposium in May, I was asked whether it wouldn’t be simpler to just draft patient control directly into the asset preservation trusts instead of adding further complexity by inserting a patient corporation and personhood organization into the mix. I had to admit it is possible that cryonics patient corporate personhood is a semantic improvement more than a functional one. However, I do think it is important to remember that a trust is not a person, but rather a relationship between persons (i.e.

which typically act as trustees for such trusts) are not well-positioned to do, is hold non-monetary personal property (i.e. keepsakes which are more valuable to the cryonicist in non-liquidated form).

Cryonics patient corporate personhood is also subject to one major risk that on its own justifies keeping the trust portion of the larger structure intact. Corporate personhood, or perhaps more correctly, the rights and protections currently enjoyed by corporate persons, have become the object of heightened public suspicion in recent years. It is not impossible that these rights could be rolled back, though I think a complete abolishment of the entire concept would only occur if there was a complete political revolution. In any case, as I’ve pointed out, trusts are useful to cryonics patients for some purposes, and patient corporations may be useful for others; and having an organization specifically devoted to advocating for and upholding cryonics patient personhood, in its natural and bootstrap forms, respectively, would benefit the cryonics movement overall. ■

“Corporate personhood, or perhaps more correctly, the rights and protections currently enjoyed by corporate persons, have become the object of heightened public suspicion in recent years.”

There is one other thing that interests me about using corporate personhood in this way. I have written before about whether cryonics patients are “property” in a truer, legal sense than we usually think of them. If this is so, then title to the patient “specimen” could be transferred to that patient’s corporate personality, subject, of course, to all the same conditions regarding the specimen’s use that accompanied the original anatomical gift to the patient’s cryonics service provider—namely that the specimen remain in the *custody and care* of the cryonics service provider. For some reason I find the idea of putting the “brain” inside the person like this to be very elegant, but I am not at all sure it poses any real advantage. One possible reason to do this would be that it would keep the specimens out of the cryonics organization’s asset column if at some point down the road a monetary value could be assigned to them that could become vulnerable to the threat of litigation. This, of course, is the reason why the funds earmarked by Alcor for indefinite patient care have been transferred into the Alcor Patient Care Trust; would it not make just as much sense to take

trustee and beneficiary), and for so long as the cryonics patient is not a person, the trust is pointing at some other person as its beneficiary instead, that the cryonics patient is simply trusting without any legal recourse. My solution doesn’t avoid the “trust” issue entirely, but adds an additional check/balance, and gives the patient indirect control not just of the funds, but of a “person” on the other side that can hold title to property, enter contracts, and sue (...and be sued). I think it could be argued also that cryonics patient corporate personhood makes asset preservation trusts redundant—that is to say, why would you have someone hold your money for you if “you” are holding it yourself (while someone else is propping you up)? But we mustn’t forget to divide labor where appropriate. The mandate of the cryonics patient personhood organization would not be focused on wealth management, so there is still good reason to place assets in the hands of those with the expertise to make their value rise with the times. On the flip side, something cryonics patient corporations could do that asset preservation trusts (and the institutions

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CRYONICS WITHOUT REPAIR

WHY REVERSIBLE CRYOPRESERVATION MATTERS

By Aschwin de Wolf

[The following is a text adaptation of a PowerPoint presentation given on Sunday, May 12, 2013 at the Resuscitation and Reintegration of Cryonics Patients Symposium in Portland, Oregon.]

Let's start with the following definition of cryonics:

"Cryonics is the stabilization of critically ill patients at ultra-low temperatures to allow resuscitation in the future."

As you can see, nothing in this definition says that repair is an intrinsic feature of cryonics. But is this a reasonable perspective? Let's think about a number of aspects of cryonics that could be classified as "repair."

- Critically ill patients are sick and will need medical treatment in the future.
- Most cryonics patients will require rejuvenation.
- The cryopreservation process itself causes (irreversible) damage.

Yes, cryonics patients will require a second look at their condition by a future doctor who will have more advanced medical technologies at his/her disposal. This could conceivably be called "repair." Most cryonics patients will also require rejuvenation biotechnologies. After all, it makes little sense to cure the patient's disease but leave him/her in a fragile, debilitated state. This could be called "repair" too, in particular if you believe that aging is the progressive accumulation of damage. The repair that I want to discuss here is repair of the damage that is associated with the cryopreservation process itself. If we can eliminate this kind of damage, and the

associated requirement of repair in the future, we will make the idea of cryonics a whole lot more attractive. What would be the advantages of being able to offer such "cryonics without repair?"

"Less damage is also likely to translate into lower costs, too, and it is rather obvious that such an advantage can mean more security for the patient."

Perhaps the most obvious advantage is that cryonics could not be dismissed solely by pointing to the (irreversible) damage caused by the cryopreservation process itself. In essence, such a form of cryonics would be akin to putting a critically ill patient in a state of true suspended animation. This would strengthen the legal position of cryonics patients because a decision to abandon a patient in such a condition would be more akin to murder (or at least serious neglect). Another advantage would be that the absence of cryopreservation damage would increase the likelihood of the patient being restored to good health in the future. Less damage is also likely to translate into lower costs, too, and it is rather obvious that such an advantage can mean more security for the patient. Reversible cryopreservation may also lead to earlier treatment and resuscitation attempts, which may reduce challenges associated with re-integration. Cryonics without repair also matters in

the here-and-now. Without the goal of reversible cryopreservation there are no objective, empirical criteria to evaluate the quality of care in a cryonics case. Last, but not least, we should do no harm. Allowing unnecessary injury of the patient because future advanced technologies should be able to fix it is a morally suspect gamble with a person's life.

That is an impressive list of arguments in favor of offering reversible human cryopreservation. Now let's try to be more specific about what cryonics without repair means. Clearly, the condition of the patient should not worsen relative to the critical condition the patient was in at the time of pronouncement of legal death. In fact, a rarely recognized possibility in a good cryonics case is that it might even be feasible to slightly improve the condition of the patient through the administration of cerebroprotective medications and washing out the blood, provided these procedures do not restore spontaneous circulation and consciousness, of course. A common perspective at Alcor to look at the objective of stabilization procedures is to say that these procedures should be aimed at maintaining viability of the patient by *contemporary* criteria. In the past I have characterized this objective as securing viability of the brain, but I think it would be better to aim for complete viability of the body unless there is a clear trade-off between viability of the brain (the most important organ in cryonics) and the rest of the body. Ultimately, though, we do not just want to be able to reverse the stabilization procedures but all cryonics procedures.

Before we walk through basic cryonics procedures to identify obvious and not-so-obvious opportunities for cryonics procedures to produce additional damage, let's look at circumstances in which the patient suffers additional damage that cannot be attributed to the cryonics organization. The most obvious situation is where there is a long delay between pronouncement of legal death and the start of cryonics procedures because hours go by before the patient is discovered or hospital administrators do not allow immediate access. It is important to recognize that the goal of maintaining viability can be defeated before we even start our procedures. Critics of cryonics often talk about compromising circumstances as if they are intrinsic aspects of cryonics instead of the result of tragic but avoidable events or hostile authorities. Reversible cryopreservation is only possible if the cryonics organization is notified in time and receives good cooperation from hospital administrators and other authorities.

The first real opportunity for a cryonics organization to "screw up" is to allow substantial periods of warm and cold ischemia. This can happen in a number of ways including, but not limited to, not restoring adequate circulation, inadequate ventilation, allowing blood pressure and cerebral perfusion to drop (restoring blood pressure does not guarantee good cerebral blood flow), suboptimal induction of hypothermia, or conducting surgery at high temperatures without metabolic support. In ideal circumstances a cryonics stabilization is conducted so that suboptimal results in one of these areas are offset by gains in the other protocols.

If a cryonics organization is able to provide metabolic support and rapidly cool down the patient to close to the freezing point of water the next challenges involve the cryopreservation process. The best known form of damage here is, of course, ice damage. While today's vitrification agents are formulated to inhibit ice formation at realistic cooling rates, there are still a number of things that can go wrong. The distribution of cryoprotectant in the brain can be incomplete as a result of surgical errors or

flaws during cryoprotective perfusion (e.g., vessels not properly cannulated, extremely low or high pressures, pumping air, etc.) The cryoprotectant can also be introduced at temperatures that are too warm or introduced too rapidly to allow the cells to maintain volume in an acceptable range. Even if none of these mistakes are made, we run into other challenges that cryonics organizations cannot successfully overcome yet.

"Critics of cryonics often talk about compromising circumstances as if they are intrinsic aspects of cryonics instead of the result of tragic but avoidable events or hostile authorities."

Successful vitrification requires the use of high concentrations of organic solutes (such as DMSO and formamide) and non-penetrating polymers. While much progress has been made by cryobiology researchers Gregory Fahy and Brian Wowk to formulate solutions with low toxicity, and such solutions have been shown to successfully cryopreserve brain slices, our current understanding is that it is not likely that the brain of a cryonics patient remains spontaneously viable after being equilibrated with these agents. This is partly because the "blood brain barrier" leads to a situation in which solutes naturally present in the brain become concentrated during cryoprotective perfusion (dehydration) as discussed in the next paragraph. This causes cells inside whole brains to be cryoprotected by a mixture of natural solutes and some components of the perfused cryoprotectant solution rather than just the carefully-formulated cryoprotectant solution. Sometimes natural is not good.

It is sometimes said that eliminating cryoprotectant toxicity is the "holy grail" of cryonics research. While there is good

empirical evidence to suggest that despite this toxicity good ultrastructure of the brain is still possible, true reversible human cryopreservation without reliance on sophisticated repair will require cryoprotectants with much lower toxicity. The need for less toxic cryoprotectants is especially tied into the problem of achieving concurrent and adequate distribution of cryoprotectant to all parts of the body that are vulnerable to freezing injury, which requires many hours of perfusion. In addition to cryoprotectant toxicity there are a number of other poorly-understood phenomena that could frustrate the ideal of cryonics without repair such as "chilling injury" and "thermal shock."

An interesting form of injury that is not well known by the general public but that triggers a lot of discussion among cryonics researchers is dehydration of the brain. Without exception, a well-conducted cryopreservation of the brain with present technology produces severe shrinking. In fact, this shrinkage, and the corresponding increase in concentration of salts and proteins naturally present in the brain, appears to be a key mechanism by which whole brains vitrify despite limited permeability to perfused cryoprotectants. Evidence of substantial dehydration (obtainable by direct inspection of the brain inside the skull or via CT scans) is often considered an indicator of good care in cryonics. Of course, this leaves the question unanswered whether such a degree of dehydration is compatible with viability of the brain. Yuri Pichugin, the researcher who developed the Cryonics Institute's current vitrification agent, VM-1, considered such extreme cerebral dehydration an obstacle to restoring viability after vitrification and identified a number of blood brain barrier modifiers that allowed him to recover brain slices after whole brain cryoprotective perfusion with improved viability. Whether such agents are of benefit or actually harmful is still an open research question.

Even if we could cryopreserve a human being without ice formation, toxicity, chilling injury, or other forms of injury associated with cryoprotection, there is still one remaining obstacle for reversible

cryopreservation: fracturing caused by thermal stress. While fracturing has been recognized as a problem and observed as an empirical phenomenon in patients as far back as the early 1980s, this form of injury has pushed itself to center stage (together with cryoprotectant toxicity and cerebral dehydration) since cryonics organizations started using vitrification agents aimed at eliminating ice formation altogether. If ice formation is eliminated, fracturing is the only *mechanical* form of damage left. While the significance of fracturing damage is sometimes downplayed by molecular nanotechnology experts, and fracturing at cryogenic temperatures doesn't result in actual fragmentation, letting a human brain form fractures is not what most people would consider appropriate treatment of a critically ill patient.

What is striking, however, is how little we actually know about fracturing in cryonics patients. Fracturing has been observed in patients that were cryopreserved with (relatively) low concentrations of cryoprotectants. Such protocols produced ice formation and we should therefore not be surprised about observing cracking in those patients. Even in patients who have been cryopreserved using modern vitrification agents acoustic fracturing events (which may or may not correspond with actual fractures) have been detected *above* the glass transition temperature (T_g) of the pure vitrification solution. But even these observations have little relevance to the question of what we should expect in a good case. Many cryonics patients are perfused under sub-optimal conditions due to delays after clinical death. It is therefore likely that many of these fracturing events, if real, can be attributed to ischemia-induced perfusion impairment and ice formation. And that cooling frozen tissues to very low temperatures can cause fracturing is something we already know.

There are some encouraging preliminary research results suggesting that under ideal circumstances (i.e., good equilibration, controlled cooling) fracturing is not as serious a problem as it has been made out to be. The current practice of long term care at liquid nitrogen temperature may not be salvaged by such observations, but

the intermediate temperature storage (ITS) systems that have been developed might be sufficient to eliminate this problem under good conditions at temperatures not too far below T_g. A related intriguing question is what the effect of severe cerebral dehydration is on the occurrence and frequency of fractures in the brain.

*“If ice formation is eliminated,
fracturing is the only
mechanical form of
damage left.”*

Let's say that one agrees with the objective of “cryonics without repair” (or very limited repair), and the identification of the biggest scientific and technical obstacles to achieve this. What should our research and clinical objectives be? For starters, cryonics organizations should continue to cultivate an interest in personal alarm systems and securing good legal and logistical cooperation with providers of medical care. One technical development that deserves to be introduced is “field vitrification.” Strictly speaking, the phrase is a misnomer because we are not really talking about the patient being *vitrified* in a remote location; it is the *cryoprotective perfusion* part of the procedure that is done prior to transport to Alcor (in remote cases). Evidence from at least three labs indicates that perfusing the patient in the field with a vitrification solution and shipping on dry ice is safe, practical, and superior to blood substitution in most scenarios. While remote blood substitution (“washout”) is clearly demonstrated to be better than shipping the patient without removing the blood, it is not likely that hypothermic organ preservation solutions capable of keeping the brain viable for longer than 24 hours, and capable of inhibiting whole body edema, will be developed any time soon. Field vitrification is simply the next logical development in high-quality evidence-based cryonics. Other important improvements include better cooling efficiency (e.g., using cyclic cold lung lavage), improved cardiopulmonary

support protocols, a renewed emphasis on monitoring during casework, and the introduction of intermediate temperature storage.

The most formidable challenge will be to develop what I call “brain-friendly” cryoprotectants. What needs to be accomplished? These agents should have no, or tolerable, toxicity, eliminate chilling injury and other poorly-understood forms of cryopreservation injury, allow safe and fracture-free storage at intermediate temperatures, and allow cryoprotective perfusion with greater penetration of agents into brain tissue with less dehydration so that results in whole brains can more closely match the high viabilities now obtainable in brain slices.

At my own company, Advanced Neural Biosciences, we have successfully developed a rat EEG model to screen for such brain-friendly cryoprotectants. As I write up this presentation, we have been successful in recovering integrated whole brain electrical activity after hypothermic circulatory arrest at 0° Celsius. Our next objectives are to recover EEG activity in the brain after cooling to subzero temperatures and to understand the relationship between cryoprotectants, the blood brain barrier, dehydration, and viability. It is too early to report any significant findings yet, but one thing that has become quite clear to us is that adequate ventilation during cool down is essential to recovery of whole brain activity. This is rather important because cryonics organizations have not been that concerned about meeting the brain's demand for oxygen during stabilization, and during blood washout and blood substitution in particular. No doubt, if we continue this research we will learn other things that have direct relevance to the practice of cryonics. ■

The whole brain cryopreservation research project has been made possible by the generous support of the Life Extension Foundation. The author also wishes to thank the Immortalist Society, Cryonics Institute, Alcor, LongeCity, 21st Century Medicine, Alan Mole, York Porter, Jordan Sparks, David Ettinger, Ben Best, Mark Plus, Peter Gouras, James Clement, Luke Parrish, and John Bull for additional support.

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SENS Lecture: Technologies for Reading, Writing & Interpreting Omes: George Church, Harvard Professor of Genetics & Director of the NIH Center for Excellence in Genomic Science



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Professor, Dept. of Genetics,
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- **Calorie Restriction in Primates:**
Donald Ingram, Rozalyn Anderson, Luigi Fontana
- **Small-Molecule Interventions Effective at Late Age:**
Dongsheng Cai, Danica Chen, Frank Madeo
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Jan van Deursen, John Sedivy, Kevin Perrott, Janko Nikolich-Zugich
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Please bring this notice to the attention of your associates involved in biomedical aging research

COOLER MINDS PREVAIL

BRAIN FITNESS

By Chana de Wolf



Book Review: *The SharpBrains Guide to Brain Fitness: How to Optimize Brain Health and Performance at Any Age* by Alvero Fernandez

Of all the organs in the human body, a cryonicist should be most concerned about the health and integrity of his or her brain. Thousands of books have been written about physical health and fitness, but very few address the topic of how to keep the brain fit and healthy. Happily, interest in brain fitness, once relegated to academics and gerontologists, is now taking root across America and the world.

The importance of lifelong learning and mental stimulation as a component of healthy aging has long been recognized and touted as a way to stay mentally alert and to stave off dementia in old age. As with physical exercise, “use it or lose it” appears to apply to our brains too. And now that scientists are learning more about neuroplasticity and how brains change as a result of aging, they have begun to test the effects of various factors on brain health and cognitive ability across the lifespan.

Unfortunately, like much health-related research, the results reported by the media have often been convoluted, confusing, and even contradictory. Products developed by overzealous entrepreneurs make outlandish claims and frequently don’t deliver the purported results. Consumers and professionals alike are left wondering what works and what doesn’t when it comes to maintaining our brains in optimal working condition.

To aid all those navigating the murky waters of brain fitness, enter SharpBrains—a company dedicated to tracking news, research, technology, and trends in brain health and to disseminating information about the applications of brain science innovation. In so doing, they “maintain an annual state-of-the-market consumer report series, publish consumer guides to inform decision-making, produce an annual global and virtual professional conference,” and maintain SharpBrains.com, a leading educational blog and website with over 100,000 monthly readers.

Most recently, SharpBrains has published a book on brain fitness called *The SharpBrains Guide to Brain Fitness: How to Optimize Brain Health and Performance at Any Age*. A compilation and condensation of information accumulated over the lifespan of the company, *The SharpBrains Guide to Brain Fitness* emphasizes credible research and goes to great lengths to provide the most up-to-date research results in specific areas of brain fitness, followed by interviews with scientists doing work in those fields. The goal of the guide is to help the reader begin to “cultivate a new mindset and master a new toolkit that allow us appreciate and take full advantage of our brain’s incredible properties...[by] providing the information and understanding to make

sound and personally relevant decisions about how to optimize your own brain health and performance.”

“As with physical exercise, ‘use it or lose it’ appears to apply to our brains as well.”

The *Guide* begins by emphasizing that the brain’s many neuronal networks serve distinct functions including various types of memory, language, emotional regulation, attention, and planning. Plasticity of the brain is defined as its lifelong capacity to change and reorganize itself in response to the stimulation of learning and experience—the foundation upon which “brain training” to improve cognitive performance at any age, and to maintain brain health into old age, is predicated.

The difficulty of making sense of the scientific findings on brain health and neuroplasticity is discussed at length, with the finger of blame pointed squarely at the media for reporting only fragments of the research and for often reporting those results which are not most meaningful. The authors stress that “it is critical to complement popular media sources with independent resources, and above all with one’s own informed judgment.”

The following chapters go on to review what is known today about how physical exercise, nutrition, mental challenge, social engagement, and stress management can positively affect brain health. Along the way they provide dozens of relevant research results (as well as the design of each study) to support their recommendations. Reporting on all of those experiments is beyond the scope of this review, so if you are interested in examining them (and you should be!) please obtain a copy of the *Guide* for yourself or from your local library.

Physical exercise is discussed first because of the very strong evidence that exercise—especially aerobic, or “cardio,” exercise—slows atrophy of the brain associated with aging, actually increasing the brain’s volume of neurons (i.e., “gray matter”) and connections between neurons (i.e., “white matter”). While much of the initial research supporting the effects of exercise on the brain came from animal studies, the authors report that “several brain imaging studies have now shown that physical exercise is accompanied by increased brain volume in humans.”

Staying physically fit improves cognition across all age groups, with particularly large benefits for so-called “executive” functions such as planning, working memory, and inhibition. A 2010 meta-analysis by the NIH also concluded that physical exercise is a key factor in postponing cognitive decline and/or dementia, while other studies have found physical exercise to lower the risk of developing Parkinson’s disease, as well.

But don’t think that just any moving around will do the trick. When it comes to providing brain benefits, a clear distinction is drawn between physical *activity* and physical *exercise*. Only exercise will trigger the biochemical changes in the brain that spur neurogenesis and support neuroplasticity. It doesn’t need to be particularly strenuous, but to be most beneficial it should raise your heart rate and increase your breathing rate.

Of course, adequate nutrition is also imperative in obtaining and maintaining optimal brain health. *The SharpBrains Guide to Brain Fitness* primarily highlights the well-known benefits of the Mediterranean

diet, which consists of a high intake of vegetables, fruit, cereals, and unsaturated fats, a low intake of dairy products, meat, and saturated fats, a moderate intake of fish, and regular but moderate alcohol consumption. But I think it is safe to say that the jury is still out on the best diet for the brain, as evidenced by the recent popularity of the Paleo diet among life extensionists. And, of course, ethnicity and genetics are important, too. The authors do stress the importance of omega-3 fatty acids and antioxidants obtained from dietary sources, stating firmly that “to date, no supplement has conclusively been shown to improve cognitive functioning, slow down cognitive decline, or postpone Alzheimer’s disease symptoms beyond placebo effect.” This includes herbal supplements such as Ginkgo biloba and St. John’s wort.

maintaining long-term brain health. If you are an artist, try your hand at strategy-based games. If you’re an economist, try an artistic activity. Get out of your comfort zone in order to stimulate skills that you rarely use otherwise.

The SharpBrains Guide states that “lifelong participation in cognitively engaging activities results in delayed cognitive decline in healthy individuals and in spending less time living with dementia in people diagnosed with Alzheimer’s disease.” This is hypothesized to be because doing so builds up one’s “cognitive reserve”—literally an extra reservoir of neurons and neuronal connections—which may be utilized so that a person continues to function normally even in the face of underlying Alzheimer’s or other brain pathology. This observation raises another

“Staying physically fit improves cognition across all age groups, with particularly large benefits for so-called ‘executive’ functions such as planning, working memory, and inhibition.”

Beyond what we normally do to keep our bodies healthy, the *Guide* also discusses the relative effectiveness of different forms of “mental exercise.” Perhaps you’ve heard that doing crossword or Sudoku puzzles will keep you sharp and alert into old age, or that speaking multiple languages is associated with decreased risk of Alzheimer’s disease. The good news is that these things are true—to a degree. The part that is often left out is that it’s the *challenge* of these activities that is important. As with physical activity vs. physical exercise, mental exercise refers to the subset of mental activities that are effortful and challenging.

Puzzles and games may be challenging at first, but they (and other mental exercises) can quickly become routine and unchallenging. In order to reap the most benefit from mental exercise, the goal is to be exposed to novelty and increasing levels of challenge. Variety is important for stimulating all aspects of cognitive ability and performance, so excessive specialization is not the best strategy for

important point on which neuroscientists and physiologists do not yet fully agree. Will we all eventually get dementia if we live long enough without credible brain rejuvenation biotechnologies? This is a topic I would like to return to in a future installment of *Cooler Minds Prevail*.

Social engagement also appears to provide brain benefits. The NIH meta-analysis mentioned earlier concluded that higher social engagement in mid- to late life is associated with higher cognitive functioning and reduced risk of cognitive decline. Brain imaging studies indicate an effect of social stimulation on the volume of the amygdala, a structure that plays a major role in our emotional responses and which is closely connected to the hippocampus, which is important for memory.

Yet again, not all activity is equal. When it comes to social stimulation, “you can expect to accrue more benefits within groups that have a purpose (such as a book club or a spiritual group) compared to casual social interactions (such as having a

drink with a friend to relax after work).” To keep socially engaged across the lifespan, seek out interactions that naturally involve novelty, variety, and challenge such as volunteering and participating in social groups.

“The lifelong demands on any person have changed more rapidly in the last thousand years than our genes and brains have,” *The SharpBrains Guide* explains in the intro to the chapter on stress management. The result? It has become much more difficult to regulate stress and emotions. It is great that we have such amazing and complex brains, but humans are among the few animals that can get stressed from their own thoughts. And while there are some (potentially) beneficial effects of short bursts of stress, high and sustained levels of stress can have a number of negative consequences. Those of note include: increased levels of blood cortisol which can lead to sugar imbalances, high blood pressure, loss of muscle tissue and bone density, lower immunity, and cause damage to the brain; a reduction of certain neurotransmitters, such as serotonin and dopamine, which has been linked to depression; and a hampering of our ability to make changes to reduce the stress, resulting in General Adaption Syndrome (aka “burnout”).

Research-based lifestyle solutions to combat stress include exercise, relaxation, socialization, humor and laughter, and positive thinking. In particular, targeted, capacity-building techniques such as biofeedback and meditation are recommended to manage stress and build resilience. Mindfulness Based Stress Reduction (MBSR) programs have provided evidence that meditative techniques can help manage stress and research shows that MBSR can lead to decreases in the density of an area of the amygdala which is correlated with reduction in reported stress.

So it appears that multiple approaches are necessary to develop a highly fit brain capable of adapting to new situations and challenges throughout life. “Consequently,” *The SharpBrains Guide to Brain Fitness* states, “we expect cross-training the brain to soon become as mainstream as cross-training the

body is today, going beyond unstructured mental activity in order to maximize specific brain functions.”

“Social engagement also appears to provide brain benefits.”

There is growing evidence that brain training can work, but in evaluating what “works” we are mostly looking at two things: how successful the training program is (i.e., does it actually improve the skill(s) being trained?) and the likelihood of transfer from training to daily life. Building on an analysis of documented examples of brain training techniques that “work” or “transfer,” SharpBrains suggests the following five conditions need to be met for brain training to be likely to translate into meaningful real world improvements (condensed excerpt):

1. Training must engage and exercise a core brain-based capacity or neural circuit identified to be relevant to real-life outcomes.
2. The training must target a performance bottleneck.
3. A minimum “dose” of 15 hours total per targeted brain function, performed over 8 weeks or less, is necessary for real improvement.
4. Training must be adaptive to performance, require effortful attention, and increase in difficulty.
5. Over the long-term, the key is continued practice for continued benefits.

Meditation, biofeedback, and/or cognitive therapy in concert with cognitive training to optimize targeted brain functions appear to be winning combinations in terms of successful techniques facilitating transfer from training to real life benefits. Top brain training software programs, based on SharpBrains’ analysis and a survey of their users, include Lumosity, Brain

games, brainHQ, Cogmed, and emWave.

In the end, brain fitness needs are unique to each individual and brain fitness claims should be evaluated skeptically. SharpBrains recommends asking several questions when evaluating brain fitness claims, particularly whether there is clear and credible evidence of the program’s success documented in peer-reviewed scientific papers published in mainstream scientific journals that analyze the effects of the specific product.

Of course, your own individual experience with the product is ultimately the most important evaluation of all. If you are ready to take the plunge into the emerging brain fitness market, *The SharpBrains Guide to Brain Fitness* is a good place to start, and I’m sure they’d appreciate your feedback as this field continues to develop. ■

CRYONICS IN NEW YORK: DECLINE, TRAGEDY, AND TWILIGHT: 1969-1974 AND LATER

By R. Michael Perry



For a brief period in the late 1960s the Cryonics Society of New York was doing well. Their newsletter *Cryonics Reports* was the leader in the field and their technical expertise was quite high for such a small, controversial movement. When their human freezings started in July 1968 with Steven Mandell they were well-prepared, with a ready capsule and a mortician to assist with legal matters as well as details of the procedure. By the following spring they had carried out four cryopreservations, and that summer would pioneer the use of a new, upright patient storage container, dubbed the “forever flask.”¹

Early on, however, signs of trouble appeared. Mandell had been less than forthright about his medical history in applying for an insurance policy to pay for his cryopreservation; he had Crohn’s disease and would soon die of it. When he was frozen, the insurance company refused to honor the \$10,000 policy, leaving his mother, Pauline, struggling to raise the funds.² A funding problem also developed over Ann DeBlasio, frozen in Jan. 1969. Indeed, the only patient for which funds were always provided as needed was Paul Hurst, frozen in March 1969. Hurst would be the last case for the rest of the year. As 1969 drifted into 1970, in other ways there was a deepening slump. The CSNY newsletter, bravely retitled *Immortality* with the January 1970 issue, was soon being issued irregularly due to lack of funds

and would cease publication with the spring 1971 issue. (With the absence of newsletters it becomes more difficult to determine what happened and dates and other details are less precise.) A new case, in May 1970, was memorable nonetheless.

Beverly Greenberg had seen Bob Ettinger on TV and was interested in cryonics but hadn’t considered it enough of an urgency to be actively involved.³ That attitude changed dramatically in the spring of 1970, when the seventeen-year-old’s father, Herman, aged 42, suffered a fatal heart attack. Beverly, a very bright and

talented youngster, was working in Florida as a camera girl on the movie *The Beguiled* (which starred the young Clint Eastwood). Though the family’s main residence was in Philadelphia, the death occurred in their other home in Atlantic City, New Jersey. Beverly’s mother, who had no interest in cryonics, arranged for burial in a cemetery near Philadelphia. But Beverly refused to give up, even though she would later say, “My father’s last words were: ‘Don’t freeze me.’” (It appears she wasn’t actually present at his death. Beverly was known for sometimes fantasizing out loud, as if



Beverly Greenberg stands in front of the capsule holding her father. Curtis Henderson at right. July 1972.

PHOTO CREDIT: Retouched image based on photograph from Mike Darwin, private communication 23 Mar. 2011; date of photo (cropping) from CH-6.



Herman Greenberg.

“play-acting.” But her anti-death stance was serious enough.) In the words of her friend Mike Darwin, “Beverly hated death, she hated the terrible imposition it was on her freedom to be with her father, and she took the action she did because she didn’t believe in giving up—not ever.” Beverly herself said, “I simply could not go on with my own normal existence thinking of my father decomposing in the ground.”

So one morning around 3 o’clock a call came in to Fred Horn. Soon he and Curtis Henderson were on the road to Atlantic City. When they got to the Greenberg residence there was an ongoing dispute. Beverly, who had called on her own initiative, wanted to freeze her father, but her mother was angrily opposed. Curtis noticed that Beverly had dragged big “hunks of the sidewalk” into the house, apparently for some art project of hers. Considering the weight of these “three to four foot” sections, he suspected Beverly of having the sort of will that found a way, no matter what. “I knew this was the kind of person who would really go through with this,” he later said, and that’s the way it turned out.

An insurance policy covered the \$8,000 that would be charged. A new capsule was not needed; for now the patient would be stored on dry ice. A quick trip was made to Philadelphia, where the body was retrieved from its burial plot with a backhoe, and Henderson and Horn carted their patient back to St. James for freezing, first with dry ice, then (eventually) liquid nitrogen. His cryopreservation was certainly not ideal (he had died two weeks before and been embalmed⁴)—and Beverly seemed

to realize her father’s chances could be minuscule. As she said in a 1973 Pacifica interview, “There’s always that hope on the horizon that he may be brought back. But that was not the primary reason I got into it. I got into it simply to keep him preserved.”

To further “get into it” Beverly spent some time in Sayville, Long Island, staying at the Henderson residence on Holmes Court. Curtis remembered how the teenager had “memorized whole sections of Shakespeare” and was “stunned” by her brilliance and wit.

Organizationally, things were not going well. CSNY and its sister, Cryo-Span, which handled actual details of freezing and storage, existed mostly on paper. Even so, Henderson doggedly maintained the patients which, with Greenberg, now numbered four. Beverly’s arrival may have briefly seemed to turn back the increasingly somber tide of events; in any case she quickly assumed some prominence despite her youth. “Gillian Cummings”—the pseudonym she liked to use—is listed in various sources as “vice president” of one or the other organization. Take your pick, the designation was “informal” at best, but her enthusiasm, charm and dedication were real enough. To Mike Darwin, “she was one of those truly incredible people you are lucky to meet but once in a lifetime. She was so outrageous, so full of life, so able to captivate that it seems impossible to have known when she did not exist.”

Mike was especially intrigued by pictures Beverly made of her father’s treatment, including a short movie, *The Ice Men Cometh*. “The photographs and slides were beautiful, simply beautiful in the artistic sense. Others were awesome, such as the picture of her father immersed in liquid nitrogen; obviously requiring many hours

of labor, careful thought and technical perfection. Above all, I think the thing that drew me to those pictures was her aesthetic sense. Beverly knew about the drama of what we were doing, I think she saw it more clearly than anyone else ... In light of the tools and money she had to work with, the film she produced was and is nothing short of a miracle.” The movie in fact shows all the steps of the encapsulation, with most of the action by Curtis Henderson, from splitting big white blocks of dry ice at the start to hoisting and pushing the heavy capsule with its frozen occupants upright and finally, filling it with liquid nitrogen. (Actually, eleven months elapsed between the arrival of the patient in May 1970 and the encapsulation and immersion in liquid nitrogen. The patient was placed back-to-back with Paul Hurst, so another capsule was not needed.⁵) The drama was intriguingly mirrored in the facial gestures of Curtis as he goes about the various tasks, something I’ve never seen in the many other documentaries on cryonics that have by now been made, often by professionals with far larger budgets. Appropriately, the film concludes not with “The End” but “The Beginning.”

Meanwhile, the woes continued. Attitudes and funding considerations played their parts. There were various short-lived initiatives to set up new cryonics organizations in the New York area and establish new facilities, which essentially came to naught. Pauline Mandell around late 1971 reported on the formation of two new New York endeavors, Cryonics Unlimited which was to do cryopreservations, and the Society for Advancement of Cryonic Sciences, which would handle research.⁶ But these organizations do not seem to have left much imprint, nor did another



Scenes from *The Icemen Cometh*. Saul Kent, left, assists as Greenberg/Hurst capsule is hoisted upright; Curtis Henderson at a dramatic moment.

initiative, the storage-oriented Cryo-Crypt Corporation, which involved, among others, Edward Kuhrt, John Bull, and Paul Hurst, Jr.⁷ (Kuhrt was a New-York-based private detective who was hired by an insurance company to investigate CSNY, when in fact he was a member of CSNY, so naturally he found them legitimate. He became a member of Alcor in 1986 and was cryopreserved by them in 1997.⁸ Bull too would maintain long-term interest in cryonics and is still involved, while Hurst after a few years would drop out—see below.)



From left: Robert Nelson, Pauline Mandell, Nicholas DeBlasio in finished New Jersey vault; Ann DeBlasio capsule in background; about late 1971.

Nick DeBlasio meanwhile was dissatisfied with CSNY's handling of his wife (liquid nitrogen levels were too low, he said, cigarette butts were on the floor, and so on, according to Curtis Henderson). DeBlasio thought he could do better, using some money from a medical malpractice settlement over his wife's death. Robert Nelson of the Cryonics Society of California helped him set up a below-ground vault at the Mount Holiness Cemetery in Butler, New Jersey, as a branch facility of Nelson's own organization.⁹ Ann DeBlasio was moved there in her capsule in August 1971.¹⁰ (Curtis had a policy that relatives owned the capsules of their patients—the Greenbergs being an exception—and when they wanted to stop maintenance or otherwise remove a patient from the care of Cryo-Span, they generally took the capsule too.) By the following spring another patient had also been moved elsewhere: Pauline Mandell, who was financially strapped, transferred her son,

Stephen, also in his capsule, to Nelson's main facility at the Oakwood Memorial Park Cemetery in Chatsworth, California.¹¹ (Both moves would eventually have tragic consequences in which these and other patients were thawed and lost.¹² The policy that relatives took back their patients in difficult circumstances prevented this sort of disaster at CSNY's facilities.)

In December 1972 there was another freezing at CSNY, bringing their then patient count to three. Clara Dostal, a 61-year-old cancer victim and CSNY member from Washington, D.C., was perfused and frozen under relatively good conditions and stored in dry ice, since no capsule was then available.¹³ (A little fascinating background: born in Queens, New York, in 1911, Clara Adelaide Weidmann earned a Master's degree in Education from New York University, graduating at the top of her class. In 1941 she married Frank Dostal, a man with a heart condition who might otherwise have gone off to war; they had two children. Stricken with polio when the second child was born in 1944, she eventually recovered but inspired by the experience designed a self-propelled vacuum cleaner to make it easier for handicapped people to clean, received a patent on it, and was written up in the *New York Times*. The Hoover company then started marketing a very similar product as their "Hoover Dialomatic." Mrs. Dostal was preparing a lawsuit against them when stricken with cancer and she turned to cryonics.¹⁴)

Mike Darwin, a seventeen-year-old protégé of the New York group who hailed from Indianapolis, Indiana, had been intrigued by low-temperature biology and the prospects of using it for life extension since grade school. Born Federowicz, Mike was called Darwin in his Catholic high school due to his atheist's rejection of creationism in favor of evolution. The name stuck, along with a fascination for solving problems scientifically, which had already led to experiments in extending the lives of turtles and honeybees using the home refrigerator. Mike had contacted CSNY before they had frozen anyone, was now visiting and making or renewing acquaintances (one important contact was Beverly Greenberg), had assembled some equipment for doing perfusions himself (though he didn't bring it with him), and suddenly there was this case.



Mike Darwin at CryoSpan facility, West Babylon, Long Island, Jul. 1972.

Struggling with perfusion equipment furnished by Fred and Linda Chamberlain in California (who earlier that year had founded Alcor), and assisted by "Corey Noble," a young graduate student in cryobiology, Mike found the experience unnerving. "It was one thing to talk about cryonics, to think of it in abstract and distant terms, and quite another to put it into practice—to stop decay—but to do so at an enormous cost in added injury. Close to 70% of the water in Clara Dostal's brain had been converted into ice. Her body's cells had been dehydrated and chemically injured, but even more troubling, those cells and the scaffolding that held them together had been macerated by ice."¹⁵ Curtis Henderson, not overlooking the problems either, was more pragmatic, if also indulgent. "We finished up early in the morning of the next day, and after we put Dostal on dry ice, I said I needed a drink. So, we headed out to this bar that was close to the facility. It was right there in amongst the cemeteries and not very far from the garbage dump. I look at Mike Darwin and he is green, absolutely green, and he is just saying over and over, 'I can't believe things could be this bad, I can't believe things could be this bad. This thing is never gonna work. This thing is never gonna work.' Reality had finally sunk in, and I guess it was at that moment that Mike decided he was going to remake cryonics in the image of medicine, or die trying."¹⁶ (Mike would go on to a long, technically productive and colorful career in cryonics, including five

PHOTO CREDIT: Mike Darwin, private communication 23 Mar. 2011.

years as Alcor's president, late 1982 – early 1988, and is still active.)

Beverly's cryonics activities and antics meanwhile had continued off and on, including a Henderson-backed spy mission about 1971 to Nelson's rival facility in Chatsworth (where she found at that point that only one patient was being maintained—on dry ice). Then came the fateful November of 1973. She was back in Long Island, and had obtained a part-time job, ironically, with an ice cream truck (the company name was "Circus Man"). She was trying to finish a sound track for her cryonics film. At this time the CSNY patients were being stored in a facility in West Babylon close to Sayville, where Curtis still lived, with part of the building also rented to tenants. Beverly would come there two or three times a week, drive her car inside, and stay overnight. (Curtis's wife had by then forbidden Beverly to stay at their home.¹⁷) Just a few feet away loomed the tall capsule with Beverly's father back-to-back with Paul Hurst; Clara Dostal was still on dry ice.

On November 16 police, on a tip from a tenant, found Beverly's lifeless body in the front seat of her car, in the Cryo-Span facility. The keys were in the ignition and the gas tank read empty, suggesting she had been running the engine to keep warm in the autumn chill and suffocated from carbon monoxide that built up in the enclosed space. The police affirmed that her death was due to carbon monoxide,¹⁸ but to Mike Darwin who would soon see the body, her chalky-white features seemed to rule this out since carbon monoxide poisoning leaves a characteristic, flushed or rosy appearance. In any case, by law, all suspicious or unattended deaths required investigation, including autopsy. Mike and Corey Noble, both now in Georgia, rushed out with perfusate chemicals, trying to save Beverly from the dissecting blade and get her frozen—but to no avail. At the time she had neither written arrangements nor funding for cryopreservation, despite serious involvement now stretching back several years. In such situations, next of kin had legal standing; the day after the autopsy, her unfrozen remains were cremated.

Her movie remained unfinished, silent, its sound track never completed. Sometime later Curtis found the deteriorating film in storage and had a video copy made. (He also tried to get the partly completed

sound track from a relative but was unable.) Apparently then the original film was lost and all we have is this imperfect copy to give an idea of what it contained.

Mike Darwin was devastated by Beverly's tragic passing and outraged at the intransigence of those in charge who couldn't understand the importance of freezing her. And this horror was not the end of it. Beverly's unusual death came to the attention of the New York State Department of Health, and when they learned about the frozen bodies, they took action that further compromised CSNY and contributed to its demise. A letter dated January 29, 1974 ordered Curtis to dispose of "deceased persons" at the West Babylon facility within 15 days, threatening a fine of \$1,000 per day for non-compliance. Beverly's mother also made it clear she wasn't interested in continuing the freezing of her husband. Mr. Greenberg was reburied.

Space was found elsewhere for the capsule, still containing Paul Hurst, and Mrs. Dostal was put inside where Greenberg had been. In November 1974 Mrs. Dostal was removed from storage at the request of a family member who no longer wanted the burden of keeping her frozen.¹⁹ (The Dostal children had previously made overtures to Nelson to take on the storage of their mother and had sent money to make the arrangements, but nothing came of it other than bitter feelings and a lawsuit against Nelson which others would eventually join and would culminate in the notorious "Chatsworth trial" in California in 1981. Nelson and a mortician who assisted him were assessed nearly \$1 million in penalties for allowing patients to thaw and other irregularities, while Nelson maintained that the problems were caused by circumstances beyond his control, mainly, lack of funds. The mortician's insurance paid \$400,000 to relatives of one of the California patients; proceedings against Nelson himself would eventually be dropped, and others including the Dostals would receive nothing.²⁰ Prior to the lawsuit the Dostals had also obtained a capsule which went unused and had then been sold—see below.²¹) As for Hurst, according to Henderson, "his son was doing research at University of Pennsylvania in Pittsburgh, and they cut his grant or something. He thought there was going to be a nuclear war, so he moved to



Clara Dostal.

New Zealand. So he couldn't keep paying me to keep his father frozen anymore. And he was the best customer I had, because he had always paid his bills, and then he told me straight out, he'd had enough and it was time to bury the man, and that was it."²²

With the death of Beverly CSNY was all but finished but one more time they would freeze somebody. Michael Baburka, a 62-year-old who lived in the area, suffered a fatal heart attack April 10, 1974. His son, Michael Jr., contacted CSNY and the freezing was carried out, though it appears that immediately or very soon the encapsulated patient was returned to the son who arranged for storage and maintenance on his own. More than three years later, in October 1977, a newspaper article reported that the father was still being maintained in a mini-warehouse by his son, who periodically added liquid nitrogen to the \$5,000 capsule, which evidently was horizontal and (very unusual outside of movies) equipped with a see-through window. A permit to store the body had been obtained from the Borough of Brooklyn. At some time subsequent to this (details undetermined, presumably soon) the maintenance was terminated and the whole capsule with its occupant was buried.²³

Ironically, in the midst of the woes that were bringing it down with the loss of all its patients, the dying CSNY would help in the rise of another cryonics organization, Trans Time, in Northern California. Backtracking slightly from the Baburka freezing: on February 9, 1974 "Frank Riley," a Maryland resident, died and was frozen by his enterprising, cryonics-seeking son, who liked to carry wads of \$100 bills around for

PHOTO CREDIT: Author's rendering based on photograph, Mike Darwin, private communication 23 Mar. 2011.

important missions. He first enlisted Mike Darwin and Corey Noble to help with the freezing, then, with Dad on dry ice, made a journey to New York and looked up Curtis Henderson, completing the trip to Sayville from the airport on foot when he couldn't hail a taxi. Henderson did not want to take on any more patients but called Art Quaife of Trans Time and, with funds provided by the son, helped obtain a capsule (from the Dostals), which was then used to store Mr. Riley at the California facility. Though formed in 1972, Trans Time was just then finishing its first cryopreservation, and the organization was still very much in a startup phase.²⁴ At any rate the help worked to good effect: Riley's preservation nearly 40 years ago now continues at

Alcor. As a cost-saving measure, in 1983 while in Alcor's care he was converted to neuropreservation,²⁵ a possibility that seems to have escaped notice in earlier cases that ended so disastrously.

In any case, we must temper our judgment. A tiny group of what the rest of society saw as extremists sought immortality by the only physical means that appeared to have a chance of success. They had their faults and foibles, and made a fair share of blunders attempting the near-impossible, yet tried long, hard and heroically. Much of their efforts were undone in the end, yet from their mistakes a stronger cryonics movement emerged that endures today and may yet bridge the gap to a brighter tomorrow. ■

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In the references that follow there are frequent citations to portions of "Thus Spake Curtis Henderson," a 6-part interview conducted by Charles Platt and annotated by Mike Darwin, now online. The sections referred to here and their abbreviations are as follows. Part 4, <http://chronopause.com/index.php/2011/02/10/thus-spake-curtis-henderson-part-4/>, accessed 29 Jun. 2013, here abbreviated CH-4; Part 5, <http://chronopause.com/index.php/2011/02/11/thus-spake-curtis-henderson-part-5/>, accessed 30 Jun. 2013, CH-5; and Part 6, <http://chronopause.com/index.php/2011/02/12/thus-spake-curtis-henderson-part-6-2/>, accessed 29 Jun. 2013, CH-6.

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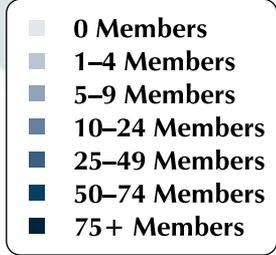
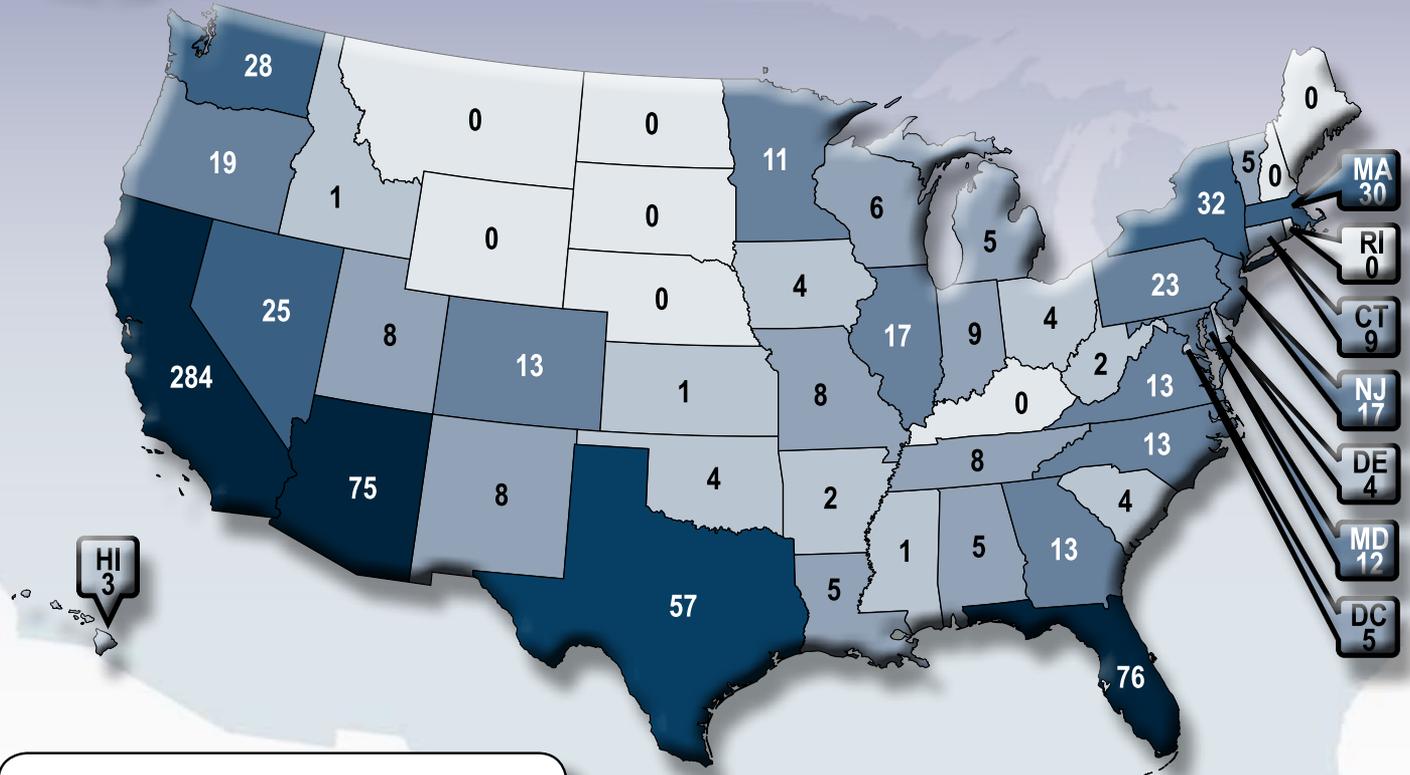
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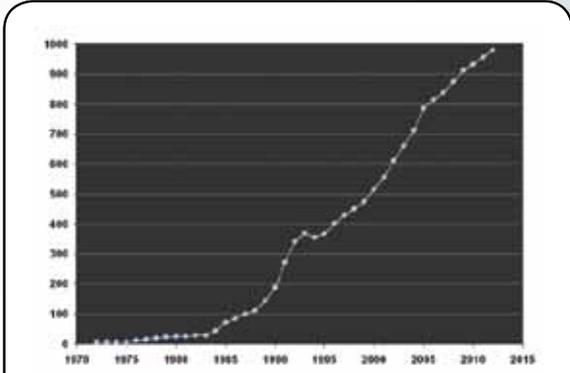
Membership Statistics



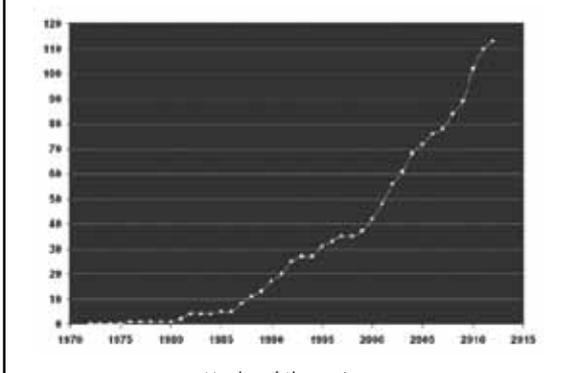
2013	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
Members	981	983	985	974	980								
Patients	114	115	117	117	117								
Associate	37	40	42	44	45								
Total	1132	1138	1144	1135	1142								



Country	International	
	Members	Patients
Aruba	1	0
Australia	13	2
Canada	42	2
Denmark	2	0
France	0	0
Germany	4	0
Israel	1	1
Italy	2	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	1
Thailand	3	0
United Arab Emirates	1	0
United Kingdom	22	2
TOTAL	110	8



Number of Alcor members



Number of Alcor patients

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**.

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

Supportive but not conclusive evidence shows that consumption of EPA and DHA omega-3 fatty acids may reduce the risk of coronary heart disease. IFOS™ certification mark is a registered trademark of Nutrasource Diagnostics, Inc. These products have been tested to the quality and purity standards of the IFOS™ program conducted at Nutrasource Diagnostics, Inc.

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EPA (eicosapentaenoic acid)	1,400 mg
DHA (docosahexaenoic acid)	1,000 mg
Olive Fruit Extract (std. to 6.5% polyphenols (39 mg), 1.73% hydroxytyrosol/tyrosol (10.4 mg), 0.5% verbascoside/oleuropein (3 mg))	600 mg
Sesame Seed Lignan Extract	20 mg



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Organic Transistors for Brain Mapping

To improve brain mapping, a group of French scientists have produced the world's first biocompatible microscopic organic transistors that can amplify and record signals directly from the surface of the brain, building on prototypes developed at the Cornell NanoScale Science and Technology Facility (CNF). This is the first *in vivo* use of transistor arrays to record brain activity directly on the surface of the cortex using electrocorticography (ECoG). This is a ten-fold improvement in signal/noise quality compared with current ECoG electrode technology, the scientists say. In epileptic patients, ECoG recordings help to scout brain regions responsible for seizure genesis. For patients with brain tumors, recordings help to chart the brain for tumor removal. In addition, electrical recordings of neuronal activity are being used in brain-machine interfaces to help paralyzed people control prosthetic limbs. Unlike previous ECoG amplifiers, the new biocompatible microdevices are flexible enough to go *inside* the skull and follow the curvilinear shape of the brain surface.

Kurzweil AI
15 Apr. 2013

<http://www.kurzweilai.net/organic-transistors-for-brain-mapping-2>

New Technique to Deliver Life-Saving Drugs to the Brain

Researchers from the Herbert Wertheim College of Medicine at Florida International University (FIU) report developing a novel technique that uses magneto-electric nanoparticles (MENs) to deliver antiretroviral therapies to HIV-infected brain cells. According to Professor Madhavan Nair, PhD, a natural filter prevents most substances from passing into the brain. As a result, more than 99 percent of HIV therapies, such as AZTTP, go to

the lungs, liver, and other organs, leaving reservoirs of HIV hidden in the brain. Nair and Professor Sakhrat Khizroev, PhD—an electrical engineer and physicist—developed a technique that binds AZTTP to a MEN that is inserted into a monocyte/macrophage cell and injected into the body. Next, the team uses a magnet to draw the MEN into the brain, where a low electrical current triggers release of the drug. Magnetolectricity then guides the drug to its target. The team has successfully tested the technique in a laboratory setting, and will soon begin the next phase of testing. The full report was published online in the journal *Nature* (2013; doi:10.1038/ncomms2717).

National Prevention Information Network
16 Apr. 2013

<http://www.cdcnpi.org/scripts/display/NewsDisplay.asp?NewsNbr=61440>

Samsung Demos a Tablet Controlled by Your Brain

One day, we may be able to check e-mail or call a friend without ever touching a screen or even speaking to a disembodied helper. Samsung is researching how to bring mind control to its mobile devices with the hope of developing ways for people with mobility impairments to connect to the world. The ultimate goal of the project, say researchers in the company's Emerging Technology Lab, is to broaden the ways in which all people can interact with devices. In collaboration with Roozbeh Jafari, an assistant professor of electrical engineering at the University of Texas, Dallas, Samsung researchers are testing how people can use their thoughts to launch an application, select a contact, select a song from a playlist, or power up or down a Samsung Galaxy Note 10.1. While Samsung has no immediate plans to offer a brain-controlled phone, the early-stage research, which involves a cap studded with EEG-monitoring electrodes, shows how a brain-computer interface could help people with

mobility issues complete tasks that would otherwise be impossible.

Susan Young / MIT Technology Review
19 April 2013

<http://www.technologyreview.com/news/513861/samsung-demos-a-tablet-controlled-by-your-brain/>

Bold Move Forward in Molecular Analyses

A dramatic leap forward in the ability of scientists to study the structural states of macromolecules such as proteins and nanoparticles in solution has been achieved by a pair of researchers with the U.S. Department of Energy (DOE)'s Lawrence Berkeley National Laboratory (Berkeley Lab). The researchers have developed a new set of metrics for analyzing data acquired via small angle scattering (SAS) experiments with X-rays (SAXS) or neutrons (SANS). Among other advantages, this will reduce the time required to collect data by up to 20 times. "SAS is the only technique that provides a complete snapshot of the thermodynamic state of macromolecules in a single image," says Robert Rambo, a scientist with Berkeley Lab's Physical Biosciences Division, who developed the new SAS metrics along with John Tainer of Berkeley Lab's Life Sciences Division and the Scripps Research Institute. "Our new set of metrics fully extends SAS to all particle types, well-behaved and not well-behaved," Rambo says.

Lynn Yarris / Lawrence Berkeley National Laboratory
25 Apr. 2013

<http://newscenter.lbl.gov/news-releases/2013/04/25/new-saxs-molecular-analyses/>

Researchers Bypass the Blood-Brain Barrier, Widening Treatment Options for Neurodegenerative and Central Nervous System Disease

The first known method to permanently bypass the blood-brain barrier, using mucosa, or the lining of the nose, has been demonstrated by researchers in the department of Otolaryngology at the Massachusetts Eye and Ear/Harvard Medical School and the Biomedical Engineering Department of Boston University. The method opens the door to new treatment options for those with neurodegenerative and CNS disease. In this study using a mouse model, researchers describe a novel method of creating a semi-permeable window in the blood-brain barrier using purely autologous (the patient's own) tissues to allow for higher-molecular-weight drug delivery to the CNS. They demonstrated for the first time that these membranes are capable of delivering molecules to the brain that are up to 1,000 times larger than those excluded by the blood-brain barrier. Study co-author Xue Han, PhD, said, "The development of this model enables us to perform critical preclinical testing of novel therapies for neurological and psychiatric diseases."

Kurzweil AI
26 Apr. 2013

<http://www.kurzweilai.net/researchers-bypass-the-blood-brain-barrier-widening-treatment-options-for-neurodegenerative-and-central-nervous-system-disease>

Brain Region May Hold Key to Aging

While the search continues for the Fountain of Youth, researchers may have found the body's "fountain of aging": the brain region known as the hypothalamus. For the first time, scientists at Albert Einstein College of Medicine of Yeshiva University report that the hypothalamus of mice controls aging throughout the body. Their discovery of a specific age-related signaling pathway

opens up new strategies for combating diseases of old age and extending lifespan. The paper was published May 1 in the online edition of *Nature*. "Scientists have long wondered whether aging occurs independently in the body's various tissues or if it could be actively regulated by an organ in the body," said senior author Dongsheng Cai, M.D., PhD, professor of molecular pharmacology at Einstein. "It's clear from our study that many aspects of aging are controlled by the hypothalamus. What's exciting is that it's possible—at least in mice—to alter signaling within the hypothalamus to slow down the aging process and increase longevity."

Albert Einstein College of Medicine,
Yeshiva University
1 May 2013

<http://www.einstein.yu.edu/news/releases/894/brain-region-may-hold-key-to-aging/>

Printable 'Bionic' Ear Melds Electronics and Biology

Scientists at Princeton University used off-the-shelf printing tools to create a functional ear that can "hear" radio frequencies far beyond the range of normal human capability. The researchers' primary purpose was to explore an efficient and versatile means to merge electronics with tissue. The scientists used 3D printing of cells and nanoparticles followed by cell culture to combine a small coil antenna with cartilage, creating what they term a bionic ear. "In general, there are mechanical and thermal challenges with interfacing electronic materials with biological materials," said Michael McAlpine, an assistant professor of mechanical and aerospace engineering at Princeton and the lead researcher. "Previously, researchers have suggested some strategies to tailor the electronics so that this merger is less awkward. That typically happens between a 2D sheet of electronics and a surface of the tissue. However, our work suggests a new approach—to build and grow the biology up with the electronics synergistically and in a 3D interwoven format."

EurekaAlert / Princeton University
1 May 2013

http://www.eurekaalert.org/pub_releases/2013-05/pues-pe050113.php

New Perspective Needed for Role of Major Alzheimer's Gene

Scientists' picture of how a gene strongly linked to Alzheimer's disease harms the brain may have to be revised, researchers at Washington University School of Medicine in St. Louis have found. People with harmful forms of the *APOE* gene have up to 12 times the risk of developing Alzheimer's disease compared with those who have other variations of the gene. Many researchers believe that the memory loss and cognitive problems of Alzheimer's result from the buildup over many years of brain amyloid plaques. The plaques are made mostly of a sticky substance called amyloid beta. For years, researchers have thought that the *APOE* gene increases Alzheimer's risk by producing a protein that binds to amyloid beta. Scientists thought that this bond could make it easier for plaques to form. But in a new study now available online in the *Proceedings of the National Academy of Sciences*, Washington University researchers show that *APOE* and amyloid beta don't bind together in cerebrospinal fluid and in fluids present outside cells grown in dishes.

Michael C. Purdy / Washington University
in St. Louis
6 May 2013

<https://news.wustl.edu/news/Pages/25386.aspx>

FAQ Cryonics Convention

Friday, Saturday & Sunday
October 25 – 27, 2013

Sponsored by: **The Society for Venturism, along with the help of Don Laughlin and the Riverside Resort in Laughlin, Nevada**

The **Society for Venturism**, along with **Don Laughlin and the Riverside Resort** is hosting a cryonics convention in October this year. **The following information is not the final announcement and is tentative and may change.** The Name of the convention will be the FAQ Cryonics Convention. FAQ, as most people know, stands for Frequently Asked Questions. This convention will be open to people who are already signed up for cryonics, and for prospects for cryonics as we also we expect a good turnout from people who are thinking about joining.

In addition to the speakers and presentations here are some other considerations:

There will be an adjoining Exhibition Room with information tables and/or booths where attendees can pick up literature from leading cryonics and life extension organizations, and talk with some of their representatives in person. Any cryonics organization, or any cryonist individuals that attend the event can have one info table (at no charge) to display their information, offer handouts, sell gifts, books or other items of interest to cryonicists.

The Riverside Resort and Laughlin Nevada are great places to have conventions and have some fun at the same time. Besides the casino with gambling, bowling alley, several movie theaters, and conventional game rooms, there is swimming in the Colorado River and places for a beach picnic. Or you can rent a ski-doo for river fun. And there is the whole rest of the town of Laughlin with several more casinos to explore that feature Las Vegas type shows. The rates for the convention, meals, and the rooms will be extremely reduced rates for us as Mr. Laughlin is a long-time cryonicist and wants to help make this an annual and affordable event. You will want to be a “charter attendee” to these conferences!

So this convention will have everything, speakers, info booths, parties, relaxation and fun in the sun AND IT WILL BE VERY AFFORDABLE. If you have any questions, or suggestions, please send them to me at pizerdavid@rocketmail.com.

Room Reservation Information



Attendees are responsible for making their own room reservations. To do this for this conference, call **Don Laughlin's Riverside Resort** at one of these numbers: toll-free nationwide: 1-800-227-3849; Nevada: 702-298-2535; or Arizona: 928-763-7070. Please tell the reservation clerks that you are attending the FAQ Cryonics Conference, and give them the nights (not the days) you'll be spending to get the special discounted rate on your rooms at the resort, and be ready to give the clerk your credit card number to guarantee your reservation.

Directions to get to Laughlin, Nevada

The Riverside Resort is easy to find once you arrive.

From Phoenix: US 93 north to I-40 west through Kingman. Take the Bullhead City / Las Vegas exit and turn right at the signal at the end of the exit ramp. Continue west taking the Highway 68 ramp toward Bullhead City / Laughlin. Highway 68 merges into Arizona Highway 95. Turn right at the Laughlin Bridge.

From Southern California: I-15 north to Barstow; I-40 east to Needles, CA. Exit on River Road cutoff, turn north for 22 miles on Needles Highway to Casino Drive, turn right.

From Las Vegas: Interstate 515, US 93/95 south through Las Vegas towards Boulder City. After passing through Henderson and the Railroad Pass, take ramp and turn right onto US 95 south toward Searchlight/Laughlin for 55 miles. Turn left onto NV 163. Head east for 19 miles. Turn right on Casino Drive.

Conference Schedule

(Subject to Change)

Friday • October 25

- 1:00p Attitude Evolution**
An increasing attitude of “Peaceful Tolerance” is evolving within human culture. This evolution provides a critical benefit to cryonicists. “Peaceful Tolerance” pertains to those beliefs and activities that you DO NOT endorse. As long as that belief or activity is voluntary and peacefully held or practiced amongst those not under undue influence or weakened mental capacity, you refrain from interfering. You might say: “That’s not for me, but I accept that is your choice.”
By Cairn Idun, BA: Human Development and Family Life –Early Education.
Affiliations:
Alcor, Venturists, Options for Safe, Secure and Legal Asset Preservation for Post-Resuscitation Access, The Young Cryonicists Gathering, Singles Week for Immortalists, Cryonicists, and Life Extensionists
- 2:00p History of Venturism**
Creating a Cryonics Hall of Fame & History
By Mike Perry, Ph.D. and Cryonics Historian, Alcor Treasurer and Patient Care Taker
- 2:30p Cryonics on Wikipedia: A Survey of Cryonics-Related Entries on Wikipedia and the Struggle to Have Cryonics Represented Accurately**
By Ben Best, BSc (Pharmacy), BSc (Physics/Computing), BBA (Accounting/Finance, PRP)
Affiliations:
Cryonics Institute, Mensa, Life Extension Foundation, National Association of Parliamentarians
- 3:00p Break**

- 4:00p Review of the Venturism Charity Programs and Recipients**
By Mark Plus, BS Mathematics, MS College Teaching
Affiliations:
Secretary for The Society for Venturism. Alcor
- 4:20p The Affordable Immortalist: Maybe you CAN defeat Death and Taxes**
By Rudi Hoffman, Cryonics Insurance Expert
- 5:00p Break**
- 6:00p Buffet Dinner & Party (\$20pp)**
- 7:30p A Biologist’s View on Why Cryonics is Feasible**
Many non-biologists presume that cryonics must be fantasy because it is not mainstream. This is a reasonable inference for those who do not appreciate how appallingly balkanised biology is, with almost all biologists being expert in only a very narrow area and having no time to study other areas. Since a field’s reputation for infeasibility is a reason not to pay attention it, this parlous situation is self-fulfilling. In this talk I will see to rectify it.
By Aubrey de Grey, Ph.D.
Affiliations:
SENS Research Foundation

Saturday • October 26

- Breakfast on your own
- 10:00a TBA**
By Catherine Baldwin, Chief Operating Office, Suspended Animation Inc.
- 11:00a TBA**
By Chana de Wolf, Research Update from Advanced Neural Biosciences, Inc.

- 12:00p Break**
- 1:00p TBA**
By Stephen Valentine, representing the TimeShip project
- 2:00p Group Discussion**
“How Can We All Make Cryonics Better?”
- 3:00p Break**
- 4:00p Cryonics Procedures and Improvements at Alcor**
By Max More, Ph.D.
Affiliations:
Alcor Life Extension
- 5:00p (1) How the Venturist No Autopsy card might prevent you from an autopsy and therefore improve your suspension, (2) Once you are in suspension, how the Venturists can provide backup protection.**
By David Pizer, BS (Political Science) Grad Study, Philosophy
Affiliations:
Society for Venturism, retired VP and Treasurer for Alcor Life Extension
- 5:30p Break**
- 6:30p Buffet Dinner & Party (\$20pp)**
- 8:00p Meet Don Laughlin**
Mr. Laughlin takes questions from the audience on any subject.

Sunday • October 28

- Breakfast on your own.
- 10:00a Presentation: TBA**
- 11:00a Group Discussion: TBA**
- 12:00p Conference Closing**

Venturist FAQ Conference Registration Form

To be held in Laughlin, Nevada on October 25, 26 & 27, 2013.

(This is to reserve attendance at the conference.)

Name: _____

I will be attending with: _____

(Each person in your party needs to fill out a registration form.)

Mailing Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ E-mail: _____

Enclosed is my payment for the following items:

Quantity

_____ Early Bird Registration (required): \$75pp \$ _____

_____ Buffet Dinner Party – Friday Night: \$20pp \$ _____

_____ Buffet Dinner Party – Saturday Night: \$20pp \$ _____

Subtotal \$ _____

Voluntary additional donation to defray conference expenses \$ _____

TOTAL ENCLOSED \$ _____

Method of payment (check one):

Check enclosed with this form and mailed to: Society for Venturism, 11255 S. Highway 69, Mayer, AZ 86333

I have emailed the form to societyforventurism@gmail.com and am paying through PayPal on the Venturists' website: <http://venturist.info>

Conference Table Resevation Information

As an attendee at this conference, you may have use of one table in the exhibition room, at no charge, to display cryonics or life extension-related information, products, books, gifts or other items of interest to cryonicists and life extensionists.

Would you like to have use of a table? YES NO

If YES, for what purpose would you like to use the table? _____

We cannot be responsible for items left unattended on guests' tables.



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 \$150 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.

Call toll-free today to start your application:

877-462-5267 ext. 132

info@alcor.org

www.alcor.org





Will You Be Alive and Healthy 10...20...30 Years from now?

Your best chance at achieving future immortality is to protect your precious health now so you can benefit from future medical breakthroughs. Staying informed about the latest health discoveries can mean the difference between life and premature death.

And the **Life Extension Foundation** can be your passport to the future. As the largest anti-aging organization in the world, we are dedicated to finding scientific ways to prevent disease, slow aging, and eventually stop death.

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.

**Join today and you'll receive
these life-prolonging benefits:**

- **A subscription to *Life Extension* magazine** (\$59.88 yearly newsstand value)...Over 100 full-color pages every month are filled with medical research findings, scientific reports, and practical guidance about using diet, nutrients, hormones, and drugs to prevent disease and slow aging.
- 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.

FREE BONUS!

- ***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.

Life Extension Foundation funds advanced vitrification and gene-chip research. Your \$75 membership fee helps support scientific projects that could literally save your life.

Call 1-866-820-4967 today.

LIVE
Healthier & Longer

LifeExtension™
FOUNDATION

Join today. Call toll-free 1-866-820-4967. Or visit www.lef.org/pim

Mention Code: PIM