

ALCOR LIFE EXTENSION FOUNDATION

A Non-Profit Organization

CRYONICS

NOVEMBER-DECEMBER 2016 · VOLUME 37:6

Quality Management in Cryonics

PAGE 12

**Bring in a New Member and
Save a Year's Dues!**

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**Cryonics in Europe:
Some Historical Highlights**

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CRYONICS



COVER STORY: PAGE 12

Quality Management in Cryonics

Alcor Quality Control Specialist

Christine Gaspar, R.N. contributes her first article on the topic of cryonics and quality control. At Alcor we aim to bring our procedures as close to reversible cryopreservation as possible. What are the goals of our procedures? What are our current challenges? What can be done to make improvements? And how we ensure good data collection and compliance?

On the cover: Suite Expansion 105 Dewar

Layout Rendering

22 **Bring in a New Member and Save a Year's Dues!**

For many members, making cryonics arrangements was not an easy decision and involved a lot of research and conversation. Talk to your friends and family about cryonics. If you bring in a new cryopreservation member you can save a year of dues by helping Alcor grow faster.

24 **FOR THE RECORD**

Cryonics in Europe: Some Historical Highlights

We take a look at cryonics in Europe, starting in the 1960s and extending to more recent events such as the formation of KrioRus, the first European cryonics organization. Over such a long period we can only cover some highlights but will aim for more interesting items, with emphasis on earlier times.

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Cryonics and Natural Selection

Evolution selects for reproductive fitness and not necessarily for strength, intelligence, or even longevity. What does this mean for cryonics? At this time, people who make cryonics arrangements have a higher chance of survival but as our numbers are small and our offspring limited, what does this mean for the evolution of mankind?

8 CEO Update

Alcor CEO Max More presents some rather encouraging membership numbers. For the first time in our history, Alcor has reached 1100 cryopreservation members! More members means Alcor will need more space for patients, and plans are currently being drawn to expand into other parts of our Phoenix building. Another positive development is the growth of the Patient Care Trust Fund, which recently exceeded **\$10,000,000** in investments.

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Alcor's new book, *Preserving Minds, Saving Lives*, is the most ambitious collection of articles about cryonics and Alcor ever published. Read here why you want to read this, donate, and give a copy to friends and relatives.

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QUOD INCEPIMUS CONFICIEMUS



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

CRYONICS AND NATURAL SELECTION By Aschwin de Wolf

“...it is not the strongest that survives; but the species that survives is the one that is able best to adapt and adjust to the changing environment in which it finds itself” so reads a quote that, in modified form, often has been mistakenly attributed to Charles Darwin but was in fact a description of Darwin's views penned by a Professor of Management and Marketing named Leon C. Megginson in 1963. But surely, one reason for the popularity of this quote is that it captures the modern view of evolution quite well. In this column I would like to briefly reflect on what cryonics means in the context of evolution and natural selection.

Any cryonicist that has not kept his support of cryonics completely to himself must have found himself in a situation where even the most reasonable arguments seemed to leave someone else completely indifferent, or even hostile. Even in the case of family members or friends there comes a point where one cannot help thinking, “well, if you would rather die than think, fine, I am not going to stop you.” It appears, then, that people who make cryonics arrangements are part of an extremely small group of people that will escape the common fate of all humans (i.e. death), as a consequence of being extremely open-minded and adaptable. But is this the “survival” that the theory of natural selection speaks of?

The modern theory of natural selection is essentially about *reproduction*. It is not necessarily the longest-lived individuals (the

survivors) whose (genetic) traits will become more common in a population but the ones whose fitness leads to greater reproductive success. It can hardly be denied that cryonicists are extraordinarily capable of adapting to change (or ready to adapt to *future* change) but it has also been quite firmly observed that cryonicists (or life extensionists in general) are lagging the general population in terms of reproduction, either because of the higher number of single persons or because of the lower interest in having children. It is sometimes observed that whereas most people seek “immortality” by ensuring their genes will survive in future generations, cryonicists see immortality by seeking to survive *themselves*. In addition, even allowing for a growing interest in cryonics, the number of people making cryonics arrangements is simply too small to have a meaningful effect on the genetic and mental traits of future generations. At best, cryonicists may find themselves being perceived as independent, courageous, individuals that were simply more capable of anticipating the future of science and medicine.

It is tempting, indeed, to think of cryonicists as a homogeneous group of people who are extraordinarily analytic and adaptable but a closer inspection of the motives of people who make cryonics arrangements suggests something different. If we look at the early days we see a disproportionate number of cryonicists who were extraordinary visionaries,

sometimes independently arriving at the same conclusions (think of Robert Ettinger and Evan Cooper). As cryonics received more mainstream exposure, however, we see different reasons why people endorsed cryonics. A partner had cryonics arrangements and the other person was persuaded to do so, too. Subcultures like transhumanism strongly favored it. A strong fear of death prompted a person to do *anything* not to die, regardless of a doubtful assessment of cryonics. In more recent times, even career considerations could have been a factor since more “market-based” salaries were available in the field. So it appears that the personality type that chooses cryonics is getting more diverse. Still it makes sense to ask about the demographics of cryonics so long as the cryonics population is substantially different from the mainstream.

Where does all this leave us concerning cryonics and natural selection? Natural selection is basically about reproductive success *despite* death. So it does not seem correct to characterize the small group of cryonicists that will survive (where others do not) as an example of Darwinian evolution in action. It may be tempting to use Darwinian terminology to characterize our situation but on closer scrutiny there are problems with this. What might be said, though, is that (successful) cryonicists will be in the extraordinary situation to live for such a long time that they can see human evolution further unfold and even be in a position to consciously *direct* it through human enhancement. ■

LETTER TO THE EDITOR

To the editor:

Thank you for publishing Ralph Merkle's fascinating proposal for a "Decentralized Autonomous Organism (DAO) Democracy" (Cryonics Magazine July-August, 2016). I wonder if Dr. Merkle can suggest a suitable online forum in which to discuss further some of the many questions it raises.

I too have proposed a DAO, with a complementary purpose, called Overlaid Personal Semantic Networks. It can be thought of as a "graph of all ideas", which can support decentralized discussion and collaboration. It's written up in "a Social Network for Ideas" at <http://oresmus.github.io>. It attracted high-quality discussion when crossposted to Google+ (which pointed me to several related proposals), so I can recommend that as a possible forum.

Bruce Smith



Merkle's Futarchy

By Robin Hanson, Ph.D. · July 6, 2016 3:00 pm · www.overcomingbias.com

My futarchy paper, *Shall We Vote on Values But Bet on Beliefs?*, made public in 2000 but officially "published" in 2013, has gotten more attention lately as some folks talk about using it to govern blockchain organizations. In particular, Ralph Merkle (co-inventor of public key cryptography) has a recent paper on using futarchy within "Decentralized Autonomous Organizations."

I tried to design my proposal carefully to avoid many potential problems. But Merkle seems to have thrown many of my cautions to the wind. So let me explain my concerns with his variations.

First, I had conservatively left existing institutions intact for Vote on Values; we'd elect representatives to oversee the definition and measurement of a value metric. Merkle instead has each citizen each year report a number in $[0,1]$ saying how well their life has gone that year:

Annually, all citizens are asked to rank the year just passed between 0 and 1 (inclusive). ... it is intended to provide information about one person's state of satisfaction with the year that

has just passed. .. Summed over all citizens and divided by the number of citizens, this gives us an annual numerical metric between 0 and 1 inclusive. .. An appropriately weighted sum of annual collective welfares, also extending indefinitely into the future, would then give us a "democratic collective welfare" metric. .. adopting a discount rate seems like at least a plausible heuristic. .. To treat their death: .. ask the person who died .. ask before they die. .. [this] eliminates the need to evaluate issues and candidates. The individual citizen is called upon only to determine whether the year has been good or bad for themselves. .. We've solved .. the need to wade through deceptive misinformation.

Yes, it could be easy to decide how your last year has gone, even if it is harder to put that on a scale from worst to best possible. But reporting that number is not your best move here! Your optimal

strategy here is almost surely “bang-bang”, i.e., reporting either 0 or 1. And you’ll probably want to usually give the same consistent answer year after year. So this is basically a vote, except on “was this last year a good or a bad year?”, which in practice becomes a vote on “has my life been good or bad over the last decades.” Each voter must pick a threshold where they switch their vote from good to bad, a big binary choice that seems ripe for strong emotional distortions. That might work, but it is pretty far from what voters have done before, so a lot of voter learning is needed.

“I, too, have proposed a DAO, with a complementary purpose, called Overlaid Personal Semantic Networks.”

I’m much more comfortable with futarchy that uses value metrics tied to the reason an organization exists. Such as using the market price of investment to manage an investment, attendance to manage a conference, or people helped (& how much) to manage a charity.

If there are too many bills on the table at any one time for speculators to consider, many bad ones can slip through and have effects before bills to reverse them can be proposed and adopted. So I suggested starting with a high bar for bills, but allowing new bills to lower the bar. Merkle instead starts with a very low bar that could be raised, and I worry about all the crazy bills that might pass before the bar rises:

Initially, anyone can propose a bill. It can be submitted at any time. .. At any time, anyone can propose a new method of adopting a bill. It is evaluated and put into effect using the existing methods. .. Suppose we decided that it would improve the stability of the system if all bills had a mandatory minimum consideration period of three months before they could be adopted. Then we would pass a bill modifying the DAO to include this provision.

I worried that the basic betting process could bias the basic rules, so I set basic voting and process rules off limits from bet changes, and set an independent judiciary to judge if rules are followed. Merkle instead allows this basic bet process to change all the rules, and all the judges, which seems to me to risk self-supporting rule changes:

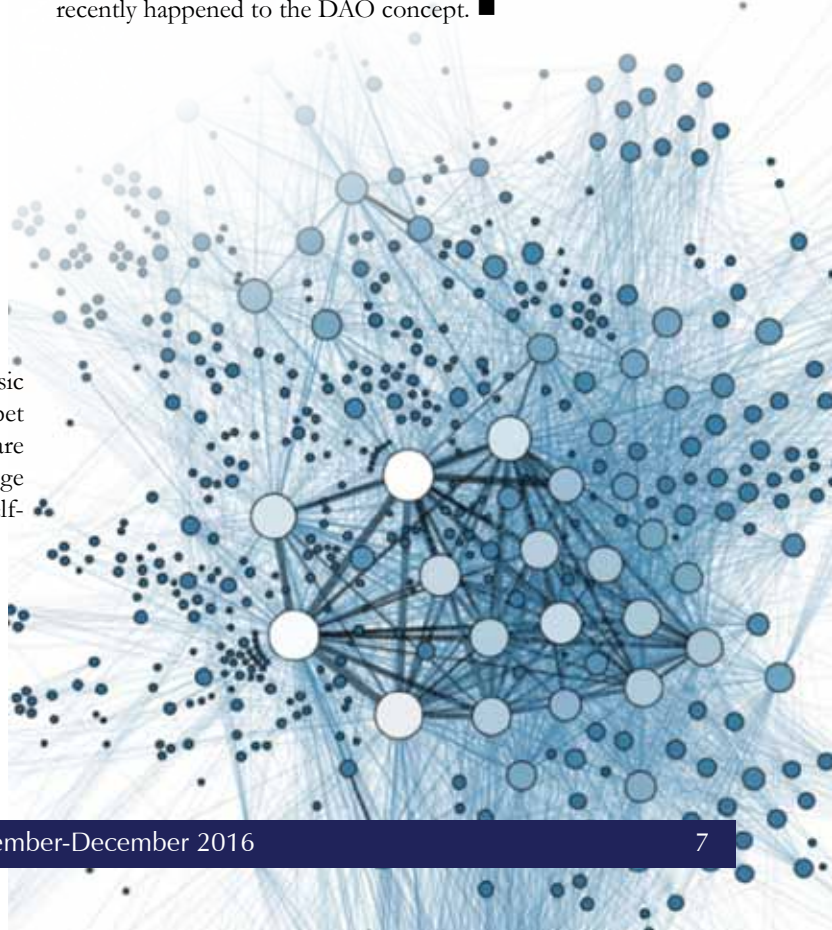
How the survey is conducted, and what instructions are provided, and the surrounding publicity and environment, will all have a great impact on the answer. .. The integrity of the annual polls would be protected only if, as a consequence, it threatened the lives or the well-being of the citizens. .. The simplest

approach would be to appoint, as President, that person the prediction market said had the highest positive impact on the collective welfare if appointed as President. .. Similar methods could be adopted to appoint the members of the Supreme Court.

Finally, I said explicitly that when the value formula changes then all the previous definitions must continue to be calculated to pay off past bets. It isn’t clear to me that Merkle adopts this, or if he allows the bet process to change value definitions, which also seems to me to risk self-supporting changes:

We leave the policy with respect to new members, and to births, to our prediction market. .. difficult to see how we could justify refusing to adopt a policy that accepts some person, or a new born child, as a member, if the prediction market says the collective welfare of existing members will be improved by adopting such a policy. .. Of greater concern are changes to the Democratic Collective Welfare metric. Yet even here, if the conclusion reached by the prediction market is that some modification of the metric will better maximize the original metric, then it is difficult to make a case that such a change should be banned.

I’m happy to see the new interest in futarchy, but I’m also worried that sloppy design may cause failures that are blamed on the overall concept instead of on implementation details. As recently happened to the DAO concept. ■



CEO Update

By Max More



As Alcor grows, it must expand its footprint, both physically and in terms of personnel. If you read my updates regularly, you will know that – at least recently – I like to provide current numbers on membership. That was not pleasant back in 2013, when membership contracted by 0.92%. In contrast, this feels like a good time for another update. Not only has membership growth continued to accelerate (so far), on August 29 we reached the nice round number of 1,100 members (1,101 at the end of the month). Here are the growth rates since then, as of the end of August 2016:

2014: 4.02%.

2015: 4.36%.

2016 YTD (August 31): annualized = 6.7%.

The most recent gain of 100 members came much quicker than the previous 100:

1100: 2016 – August

1000: 2014 – September 24

900: 2009 – August

800: 2006 – June 30

If we can maintain the current growth rate for the year as a whole, it will be the fastest growth in cryopreservation membership in 11 years (and a much larger growth in absolute numbers). It should go without saying that this is far from inevitable. Although applications are coming in at a pleasing rate, they could drop off. We could have more cancellations, especially if fiscal prudence and long-term sustainability point toward higher cryopreservation minimums or underfunding dues. (We also added patient numbers 147 and 148, but

membership growth has once again pulled ahead of growth in the patient population.)

Although 1,100 members is a pleasant enough round number, here's an even better one: The investments in the Patient Care Trust Fund recently exceeded \$10,000,000 for the first time. As of August 31, 2016, the investment account amounted to \$10,097,174.56. That does not include the funds in the PCT checking account. The latter is the account from which all PCT expenses have been paid, allowing the investment account to grow.

EXPANSION OF THE PATIENT CARE BAY AND OTHER BUILDING

We are making progress on shaping up plans and starting initial work on expanding the Patient Care Bay, as well as creating new office space. On July 25, we had most of the internal parts of unit 104 torn out. Stripping and retreating the floor was completed on August 8. As soon as curing was completed and permit obtained, we had the doorway cut higher (on August 22) and moved the Rescue Vehicle into 104, freeing up 105 for the first steps in the expansion. We have a new architect with an impressive collection of projects to his name. He and his team have proven themselves adept at securing permits quickly, and at being highly responsive in drawing up plans.

We expect to have detailed plans and cost estimates for various options ready in time for the Annual Meeting on September 10. We will also have a phased schedule, that includes, but goes beyond expanding the PCB. Management and Board can then decide on the timing and the scope of the work. Below is a rendering by Steve Graber of the proposed new layout.

The core of the project is to expand the Patient Care Bay into unit 105. Steve Graber produced some initial renderings of the layout as well as for an upgrade to the existing unit 106. We will gain extra office space and room for constructing tubing packs and other activities at the front end of 105. Even so, based on early sketches by Steve Graber, and assuming the adoption of the yet-to-be-tested Superdewars (each holding 9 whole-body patients, or 8 whole-body plus 10 neuro patients, or other combinations), the additional storage space allows for 22 Superdewars. That means room for another 176 whole-body patients plus 220 neuro patients (or 1,980 neuros!).

Other work we hope to have approved and underway very soon includes weather-proofing another roll-up door that has been letting in rain at times. The Emergency Vehicle will take up a good portion of unit 104, but that unit is deeper than most. That leaves us with space for a follow-up project that could include creation of new office space and installation of a mezzanine to give us more room for storage. (We *always* need more storage space, even though we have been weeding out obsolete equipment and supplies.)

The plan to move the server and phone system to a different, more secure and accessible room, is moving along. Our usual handymen came by to scope out the project of moving the power supply circuit from the existing server room to the new server room. Assuming approval is received once costs are determined, the contractor will have to run a new conduit pipe and pull wire from the circuit breaker board behind the O.R. (generator supply) over to the small server room, then install

a receptacle that matches the plug on the rack mounted server battery backup.

We finally got solid quotes on installing vacuum-jacketed lines for liquid nitrogen fills. As we suspected, doing this would not be financially sensible. We use the lines for fills far too infrequently and briefly to make this a sound investment.

From outreach to efficiency: Over the last few years, we have done a great deal to improve Alcor's presence online and in the public mind: a revamped website, FAQ videos, a YouTube video channel, and other initiatives. We have some projects still to complete. These have been on hold due to other priorities, but include a New Member Package (designed to inform new members about next steps and improving their chances and support from those around them) and a few Science FAQ videos.

For the most part, especially in light of the persistently frequent media coverage we receive, I would like to shift emphasis from public education/marketing projects to business process engineering. We need to ensure that we can handle all the attention effectively and efficiently. To that end, we have started analyzing how to improve our business processes, especially to ease the load of billing and membership administration – making things easier for us and for members (and potential members).

Tours: We had a busy and interesting week or two for tours. This started with a tour by several people from the Association of Realtors, which will probably lead to more in future. On August 9, we met with and gave a tour to six people from a Chinese hospital. This is *another* group interested in setting up a cryonics organization in their province, with a close connection to the hospital. In yet another sign of improving relations with medical professionals, we had a visit by a group from a local hospital's biobank.

Finally, on August 11, I gave tour to the Scottsdale Violent Crimes Unit. This resulted from my conversation with a detective relating to a mid-July episode (not directly involving Alcor). She was intrigued when I explained what we do and quickly got her new boss to agree to a tour. She was also very willing to pass on the word to the police who patrol the area. Since we not

infrequently bring in patients during the middle of the night, it's important that the local police know who we are and not stop us in the midst of an urgent procedure.

International kits: Although we have been busy building multiple kits for deployment in other countries, we have been finding it remarkably difficult to deploy them. Our current focus is on Canada. Although we had little trouble getting two kits to England, Canada has been much more challenging, in part due to NAFTA regulations. We already have a kit in the Toronto area. Aaron Drake and myself simply dragged several Pelican cases with us through Customs.

Shipping kits presents much greater difficulties. It's almost as though someone had built a huge wall between the US and Canada, requiring filling out reams of paperwork and navigation of arcane rules to get through. We are not selling the kits. They are not for medical use (at least according to the law). And yet our professional shipping agents have so far not solved our problems. We may have to resort to having one or two people take the kits with them. We are trying to get a full kit (including field cryoprotection equipment) to Ottawa, followed by Vancouver.

Pet pricing: Finally, after several meetings, it looks like we are on the verge of having a new, more formalized schedule of pricing for pet cryopreservation. As I write this in early September, I'm hoping we can approve these prices at the September board meeting next weekend.

Media and public education: Briefly, among the media for the month: On August 10, Alcor co-founder (and current staff member of many talents) Linda Chamberlain and I were interviewed by Norwegian TV – NRK, the biggest channel in Norway – that is producing science shows being aired during primetime with a market share at 30-40% in Norway and other Nordic countries such as Sweden and Denmark. The producer said: "We are now producing a TV series (5 episodes) about the science of aging and research that give us new perspectives on life extension in the future." We also did filming for a STEM project, Xploration Earth 2050, and did a tour to lay the groundwork for participating

in a documentary. Linda also joined me for a USA Today interview on August 19.

At the RAADFest (Revolution Against Aging and Death Festival) in San Diego in early June, I gave a talk covering cryonics to an audience of around 800 life extension enthusiasts. We took four boxes of *Cryonics* magazine and the information packet with us. Every one of them was picked up. At the event, I was pulled in to give a half-dozen interviews. Among the speakers were at least another 8 Alcor members – a fact I pointed out to the audience along with a challenge: Why aren't YOU signed up?

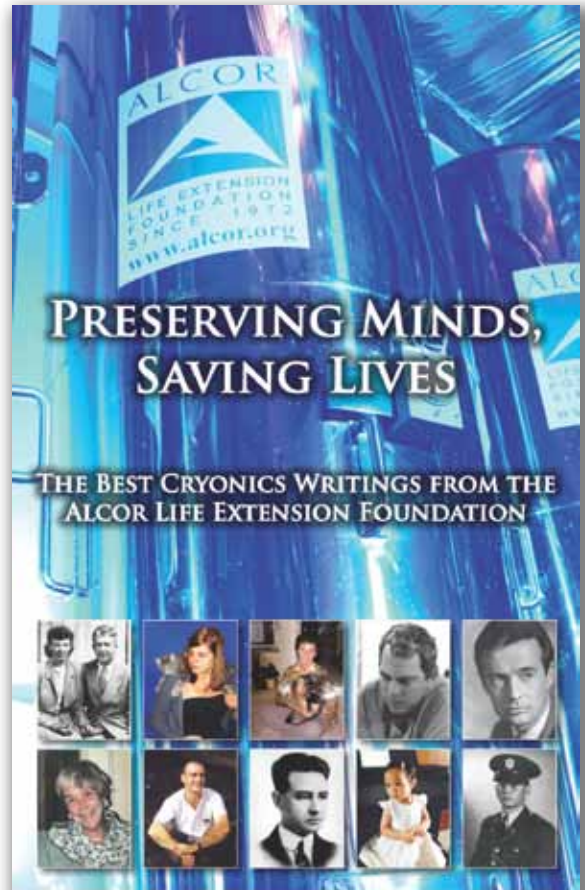
Among other media recently are several pieces focused on EDM (electronic dance music, for the unhip among you) DJ Steve Aoki. Steve's music (especially his recent Neon Future I and II) explicitly promulgates technological optimism, transhumanism, life extension, and cryonics. Neon Future I even has introductory words by Ray Kurzweil and concluding words by Aubrey de Grey, both Alcor members. See, for instance: "Inside Steve Aoki's Quest for EDM Immortality", Rolling Stone, August 24, 2016.

You can find one of this month's stories, "When Will Science Be Able Freeze People And Thaw Them Out In The Future?" (with accompanying video) here: <http://aplus.com/a/scishow-cryonics-health>

On a personal note: Well before you read this, I will have celebrated the 30th anniversary of Alcor membership. Back in 1986, I believe I was the 67th member, and Alcor had only 3 or 4 patients. Now we have 1,101 and 148 patients. From one point of view, this seems like major growth. But from a broader perspective this looks like extremely slow and disappointing growth. I call upon all of us to do our best to improve our practices and to spread awareness and understanding of cryopreservation and of Alcor's leading-edge approach. We could be near a tipping point, but it won't happen on its own. The public and the medical profession adopted anesthesia relatively quickly but took far longer to fully adopt antiseptics. Let's aim to emulate the former rather than the latter. ■

Why You Want to Read Alcor's New Book

By Stephen Bridge, co-editor



So perhaps you're fairly new to Alcor and cryonics. You're pretty sure this technology might be worth investigating; maybe you've even gotten signed up. But there's a lot you don't know. When your friends and relatives ask you those awkward questions about WHY you're doing this and what makes you think it will work, you haven't figured out solid answers yet. Especially if you live in an area without many other people involved in cryonics, you may really need solid ideas. You may even wish you have a book you could hand some of them, something that might make all of these ideas clear.

We have that book – *Preserving Minds, Saving Lives: The Best Cryonics Writings from the Alcor Life Extension Foundation*. We have been working on those answers for more than 35 years, often in the pages of our magazine, *Cryonics*. This book takes many of those great answers and puts them together in one volume for you.

Why do we preserve patients in liquid nitrogen? How might that change in the future?

What is the difference between freezing and vitrification? Why is vitrification better?

How does cryonics connect with religious beliefs?

What kind of research has been done in the past and what is needed for the future?

Why do some people choose whole body preservation and some choose to only preserve their brains?

When will the cryopreserved patients be brought back to life? Wait – should we even call them “dead” or are they already “alive” in some way? And who will pay for it?

How did this odd idea get started in the first place? What has Alcor gone through to get to this point? What mistakes

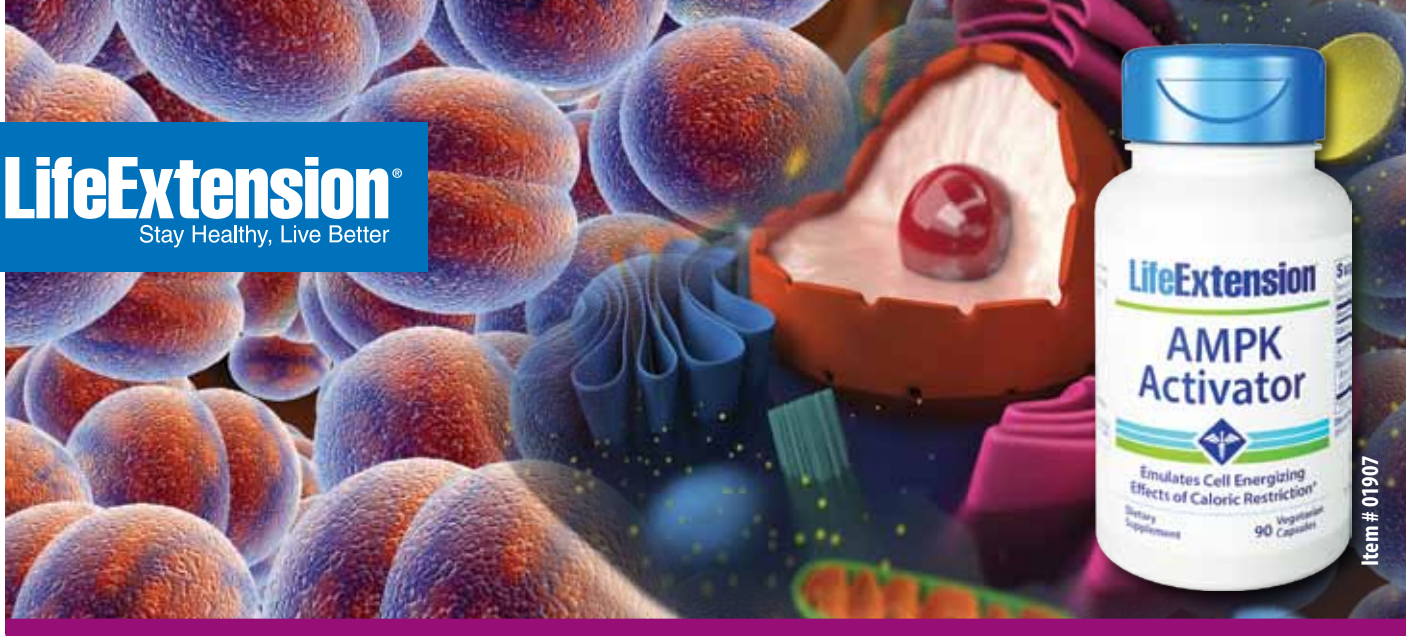
were made along the way and how do we know cryonicists have learned from those mistakes? Why the heck isn't cryonics wildly popular?

It's all here, along with many other discussions, by the best writers Alcor has had to offer for more than three decades. There are a handful of technical articles, because we want to make sure that the bases for this technology are readily available for future researchers. But most of the articles are accessible to anyone.

This is the book you need. We have both hardcover and paperback copies, and we're working on an e-book version. The book is printed on very high-quality paper and will last a long time. It ought to say something worth lasting as long as the paper.

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Item # 01907

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Life Extension® scientists have compiled years of research to create **AMPK Activator**, a specialized *dual-extract formulation* that supports AMPK activation for health optimization. This natural formula supports AMPK enzymatic activities required to safely support a more youthful cellular environment.

Importance of AMPK

Greater **AMPK** (*adenosine monophosphate-activated protein kinase*) activation has been shown to help target damaging factors of aging.⁵ Studies show **increased** AMPK activity supports reduced fat storage,⁶ new mitochondria production,⁷ and the promotion of healthy blood glucose and lipids already within normal range.⁴

Gynostemma Pentaphyllum

An extract of the plant *Gynostemma pentaphyllum* was traditionally used in Asian medicine to promote longevity and scientists now know why — *G. pentaphyllum* promotes **AMPK** activation!⁸⁻¹⁰ In one of many studies showing a wide variety of benefits, researchers documented a one-inch reduction in **abdominal circumference** in overweight individuals who took **450 mg** daily of *G. pentaphyllum* extract for 12 weeks.¹¹

Trans-Tiliroside

Trans-tiliroside, extracted from plants such as **rose hips**, also boosts **AMPK** activation, but triggers different downstream metabolic benefits

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15. *Bioorg Med Chem Lett*. 2007 Jun 1;17(11):3059-64.

than *G. pentaphyllum*.¹²⁻¹⁴ Among its many benefits, a low human equivalent dose of **56 mg** daily *trans*-tiliroside has been shown by researchers in preclinical studies to promote healthy blood glucose levels and body weight already within normal range.¹⁵

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Quality Management in Cryonics

Bridging the Gap Between Cryonics and the Medical Industry

By Christine Gaspar, R.N.

As the well-read cryonicist will know, Robert Ettinger, who by profession was a physics teacher, had thought of the idea of cryonics by the 1930s and published a story depicting it as a method of medical time travel in 1948. He promoted cryonics in 1964 with his book *The Prospect of Immortality*, and went on to found The Cryonics Institute in 1976.

Dr. James Bedford was the first human to be cryopreserved under controlled conditions – on January 12, 1967, by Robert Nelson and his associates. Bedford has been under the care of Alcor since 1982, after a checkered career at various locations, including a mini-warehouse where his son periodically had his capsule replenished with liquid nitrogen. Of all of the people cryopreserved prior to 1974, Dr. Bedford is the only remaining one.

Fred and Linda Chamberlain incorporated Alcor in 1972 and then cryopreserved their first patient in 1976. At last count, Alcor has 1101 members and 148 patients.

This progress has been glacial. Why? Alcor and the Cryonics Institute are both long-lived, stable organizations. New faces are entering the market, such as Oregon Cryonics and others, but historically, North America has only been able to support

two in the long run. What is the missing ingredient?

The average cryonicist today belongs to a rather homogenous group. Remarkable exceptions aside, the majority tend to be highly intelligent, with aptitudes for mathematics, physical, or computer sciences. They are overwhelmingly young to middle aged introverted Caucasoid men. They're generally very enthusiastic about the future, and prone to heated discussions on such esoteric topics as quantum mechanics, the persistence of identity after revival, uploading, and cryptocurrency when they are in groups of kindred spirits. They are the *Early Adopters*. The Chamberlains and Robert Ettinger were *Innovators*, along with the many pioneers

There is a second group of cryonicists who are very different. They might be interested in the concept and tread along the periphery of the various member forums, or maybe they have just been introduced to the idea. What these people have in common is that they are often grief-stricken patients or relatives desperate not to lose their lives or their loved ones. Or perhaps they just lost someone – a father, wife or child. For these people, conversations about ideology, or passionate arguments about

which cryonics organization is best are highly inappropriate. What they need to know is that the person they have just lost from their lives will be cared for in the most professional, effective, competent and dignified manner possible.

Only when cryonics graduates to the realm of mainstream medicine will it ever gain traction with the rest of society. Cryonics needs the approval and the support of the leaders of our communities, and this will not happen if we remain a fringe curiosity for the next hundred years.

All of this has been presented as an introduction to the main discussion to illustrate a few ideas. From its inception, only two Alcor CEOs have been medical professionals (Allen McDaniels, Jerry Lemler). While contract surgeons have been used in Alcor's operating room for decades, it wasn't until 2003 that paramedics began to be used by Alcor for field procedures. Alcor chief executives have been astounding, heroic, and well-meaning laymen for the most part, with incredible backgrounds and qualifications, but they lacked the depth and contextual knowledge to appreciate what it means to care for patients on the scale that they were taking on. They simply did not know what they did not know.

Since 2011 Alcor has incorporated Suspended Animation Inc. (SA) into their protocols for service to most of the continental US. Just as Alcor uses contract surgeons in its operating room, SA has extended this concept to using contract cardiothoracic surgeons and clinical perfusionists for performing field blood substitution of cryonics patients. This is an excellent concept that should extend the reach of professionals to deliver timely stabilization to patients. It can be fairly stated that they are falling short of this goal and are also in need of quality management administered by a third party observer. Evidence of these needs is described in this article.

As cryonics is now an expanding idea that is beginning to circle the globe, various volunteer groups have formed. Some have been present for many years and are quite well practiced. Others are just getting started. It needs to be emphasized that teaching a layman the mechanics of delivering good standby and stabilization is entirely different from having these procedures administered by seasoned medical professionals. To then take the matter up a level, the medical professionals also require education, ongoing support and oversight to ensure that they are applying critical reasoning to their cases in a manner *which is consistent with cryonics goals, not medical goals*.

The bottom line is that we do not *ultimately* need medical professionals or mortuary professionals to elevate our practice. We need cryonics professionals. We also need to establish the appropriate oversight and quality management to ensure that goals and standards are consistently met, that excellence in practice is achieved, and that transparency and accountability are maintained. How do we build cryonics professionals? We must start from within the medical professions and then shape these already experienced individuals into ones with our goals and our sensitivities in mind. Our act of cryonics is a gesture of trust and belief in the progress of science, and of hope that those who choose to bear the mantle of Pioneer, and take into their care our fathers, our mothers, and then ourselves will always strive for excellence and continue to break ground in our most important experiment.

Approximately a year and a half ago, James Clement, an Alcor Director, proposed that a position be created within

Alcor of Quality Management Specialist. Alcor has agreed to ensure that standards are being met, not only by its own employees, contractors, and volunteers, but also by those of their main support service, Suspended Animation, Inc. (SA). SA has long agreed to permit a third party observer to attend their cases and has shown interest in some of these ideas as they developed.

Ten months ago, after the latest Alcor conference, I was approached with this idea by Dr. Max More, the CEO of Alcor. We had discussed the possibility of my assisting with writing case reports. They had found themselves backlogged and increasingly busy with new patient activity, so it was a challenge to catch up in a manner that could give the case report writing the time and effort it deserved.

I wrote my first report draft, and after going over all the material found it necessary to submit written feedback on the case. This feedback was then added to the case report and can be seen on the Alcor website. Until then the case reports had mostly been written by the team members providing patient care, or the Medical Response Director. Looking at the situation objectively, without any suggestion of previous wrongdoing, it was clear that having the administrator and the care reporter be the same person was not a sound idea to implement broad-reaching oversight and quality management.

Giving a written case report the attention it deserves is almost a full-time job. It is a tremendous opportunity not only to assess a case from a bird's eye view, but to be able to collate data, find new opportunities for collecting data, and recognize patterns that may not otherwise be obvious. Separating this task from all of the other responsibilities of the Medical Response Director has the added benefit of freeing that person up to focus on patient-oriented tasks. Alcor cannot grow and remain healthy if it does not begin dividing these massively diversified jobs into more narrowly focused roles.

Concurrently and collaboratively, Dr. More also implemented changes that are helping to evaluate and standardize care in an effort to improve patient outcomes. These changes include instituting and reinforcing the practice of video recording all aspects of care delivery, and the careful review of such video and audio where applicable. As well, Dr. More authored a Case Report Checklist

which is used with each report to ensure that a consistent set of objectives are met each time. This checklist is also employed by the Medical Response Director to ensure that the items on the checklist are conducted, captured and related back to the author in an efficient and accurate manner.

For many years, Alcor has been capturing audio and video data of standby/stabilization and cryoprotective surgical procedures. This data was archived but seldom studied. When the task of case report writing shifted to a full-time consultant, there was an opportunity to begin watching, transcribing and assessing this valuable data. The task is very time-consuming and requires someone with a critical eye and a medical background to evaluate appropriately. It has also yielded unexpected, helpful information that would not have been obtained otherwise. It makes sense to maintain a separate job position for this task.

Changes to patient care have started to see an impact from these efforts. For example, a concern was raised from a remote team member that there was bleeding observed from a patient's endotracheal tube, which then required vigorous suctioning. By having a process in place to assess historical records, having the input of experienced providers and scientists, it was discovered that this was not the first example of this phenomenon. The matter is still under examination, but the key point is that through the input of the team, a decision was made quickly to hold one of the protocol medications and then administer it later in the cycle. It remains to be seen if this will alter the problem but now team members are being prepared to effectively deal with this adverse event.

This discussion, as well as the material of this article, is an effort to introduce the Quality Management initiative to the public, as well as demonstrate Alcor's dedication to transparency and accountability.

What is proposed in the following flow sheet is a series of objectives that are being brought in front of Alcor's chief decision makers for their consideration. It is a combination of efforts already underway as well as strategies proposed to remedy concerns related to recently assessed case video and carried forward from a long career in emergency medicine. All of the ideas are subject to modification by Alcor at their discretion.

AREA OF FOCUS

STANDBY

STABILIZATION

CRYOPRESERVATION

DOCUMENTATION

COMPETENCY

ACCOUNTABILITY

CONCERNS

Poor prognostication

Standby is often understaffed, underqualified, and/or poorly equipped

Errors and omissions in protocol administration

Frequent errors and/or disregard for universal precautions and sterile surgical technique.

Inadequate and infrequent video data capture

Inadequate video data capture

Frequent errors and/or disregard for universal precautions, sterile surgical technique and appropriate safe attire

Years of undocumented patient care in terms of missing case reports

Incomplete patient history and medical data which affects decision making regarding patient care

Errors in stabilization protocol delivery

Demonstrated inability to prioritize patient care, manage stress and apply critical thinking when providing stabilization support

Demonstrated inability to prioritize patient care, manage stress and apply critical thinking when providing stabilization support

INTERVENTIONS

Utilize remote telemetry, and end tidal CO₂ (EtCO₂) to monitor pre-arrest and peri-arrest patient decompensation
Review assessment skills with attending team members

Explore alternative solutions for increasing staffing pool in collaboration with SA and Alcor decision makers

Create a protocol flowsheet to be used during stabilization to ensure all tasks are met

Immediate re-education of all staff on proper sterile field creation and maintenance, and universal precautions

Review audio and video needs with team members

Review audio and video needs with team members

Strict application of universal precautions, aseptic, sterile principles & appropriate safe attire

Written case reports and video reports published for all patients by objective third party

Complete records for all patients including up-to-date medical history, records of final hospitalization and comprehensive original field notes

Create a non-punitive error reporting system and debriefing process modelled on similar hospital practices

Regular, frequent, ongoing, targeted educational opportunities, including selected subsidized medical modules
The use of flowsheets and decision trees as is mandated in hospital care delivery

Reporting must be conducted by an observer / author not associated with the delivery of care

EVALUATION

Assess length of time between cardiac arrest, pronouncement and initial stabilization Metrics TBD

Set target goals for staffing pool TBD
At minimum, a standby and stabilization team needs to have a surgeon, perfusionist, two high-skilled paramedical/nursing team members

Regular, scheduled, signed checks of equipment during standby and down-time which will be monitored

Immediate and ongoing evaluation of safety goals and observation of individual performance in real time in terms of maintenance of sterility and proper aseptic technique

Audio/video quality will improve. Important variables will be narrated by team

Audio/video quality will improve. Important variables will be narrated by team

Immediate and ongoing evaluation of safety goals and observation of individual performance in real time in terms of maintenance of sterility and proper aseptic technique

Target dates TBD in terms of completing backlogged case reports, case video reports and complete medical records for past and current patients

Assess for frequency of errors using live and video observation and determine if intervention has a measurable effect on numbers

Evaluate employee/ volunteer propensity to self disclose errors and investigate their attitudes towards implementing this system

Yearly competency assessments in select areas of practice as well as ongoing monitoring

Progress to be evaluated quarterly for the first year, and then yearly thereafter pending satisfactory evaluation

GOALS

Utilize remote telemetry, and end tidal CO₂ (EtCO₂) to monitor pre-arrest and peri-arrest patient decompensation
Review assessment skills with attending team members

Explore alternative solutions for increasing staffing pool in collaboration with SA and Alcor decision makers

Immediate re-education of all staff on proper sterile field creation and maintenance, and universal precautions

A 50% decrease in the time spent transcribing and assessing video data which would improve the efficiency of the author and enable them to take on other tasks within the first two new cases reviewed

Staff will demonstrate the ability to maintain a sterile surgical field and an understanding of how to correct for breaches 90% of the time within 3 months of training.

Staff will demonstrate appropriate universal precautions and wear approved attire while rendering patient care 100% of the time immediately following education

Documentation is a cornerstone of patient care. Creating comprehensive patient records will not only (potentially) serve future patients, but it is a resource for process improvement research, and serves to protect team members and Alcor from accusations of improper care. This goal has already begun to be met with the Quality Management Process

The goal is to improve general competency of all staff in terms of patient care and protocols with immediate re-education on key items. Based on video evidence, the problems are related to skill acquisition and critical thinking in a wide spectrum of interventions. The concerns at this time are greatest in standby and stabilization by many of the participating members.

These goals are in support of improving patient outcomes above all, public relations, strengthening relationships with members and supporters and creating an environment of enhanced transparency and accessibility

Ultimately, Quality Management is one strategy of many that is being implemented at Alcor in order to improve patient care delivery. The challenge is to link changes in patient care to specific, measurable results. These measurable results are represented by looking at the fundamental goals of current cryopreservation which are:

- **Standby:** To minimize time between circulatory arrest and start of procedures
- **Stabilization:** To keep the brain viable by contemporary medical criteria
- **Cryoprotection:** To inhibit ice formation and preserve ultrastructure
- **Cooling and long-term care:** To minimize fracturing, and maintain a secure long term patient environment.

This is still a work in progress, and it may take a few months to be able to assess the success of the changes as demonstrated in the above goals. This is a discussion that can be reopened once there is enough data to determine its success. Until then, Alcor will continue to make process improvements and continue to maintain accountability and transparency for its actions and plans. ■

ABOUT THE AUTHOR

Christine Gaspar is a Registered Nurse who specializes in emergency medicine, trauma and tele-triage. She served in the Canadian Armed Forces in the capacity of medic for the Lorne Scots Infantry Regiment and the 11th Field Royal Canadian Artillery Regiment. She lives near Toronto, Canada.



Christine has been the president of the Cryonics Society of Canada almost continuously since 2003. In this role she helps advocate for local cryonicists and is working with others to build an infrastructure in Canada to support cryonics standby efforts. She participated in the Alcor Southern California standby team. She has appeared in press interviews; on TV, radio and internet media in an effort to engage and educate the public on cryonics related matters as well as being a guest lecturer at McGill University in Montreal, Canada. She is a writer who has contributed essays and articles in support of cryonics and transhuman philosophy as well as working on a field manual for local DIY cryonics standby. She is a member of the Cryonics Institute and an associate member of Alcor Life Extension Foundation. Her goal is to realize a fully capable network of volunteer cryonics standby groups in Canada with professional support and service in an effort to stabilize patients over a large geographic area with field vitrification capabilities.

Christine is currently acting as a contractor for Alcor, assisting with writing and examining case reports, and helping to create a Quality Management system within the organization.



Aging as a Problem

By Martin Borch Jensen

Getting older is the single biggest risk factor for most scary diseases (cancer, heart disease, Alzheimer's...)¹. Such diseases, caused primarily by aging, kill about 32 million people per year, or 87 thousand people per day. The simple graph below compares this to the bloodiest conflict in human history, as well as the most violent incident of terrorism.

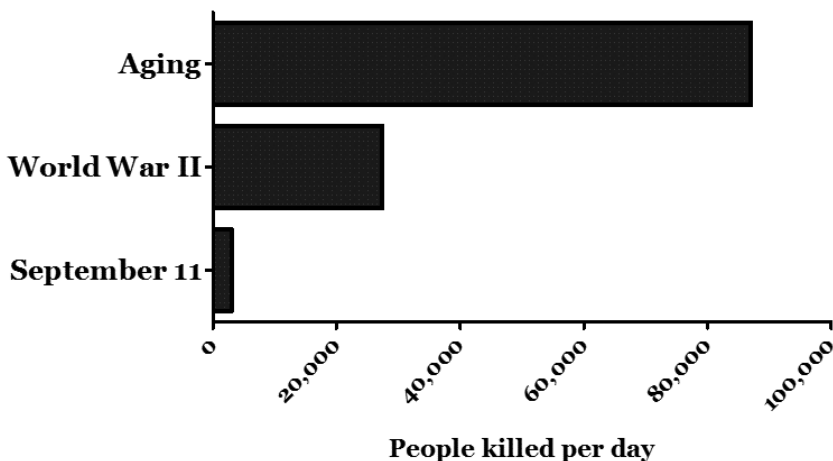
To be fair World War II didn't involve the entire world, and the total population was smaller back then. But the 3.5 fold scale should adequately balance that. Try to visualize WWII raging, people dying in agony; if there was a chance to end it,

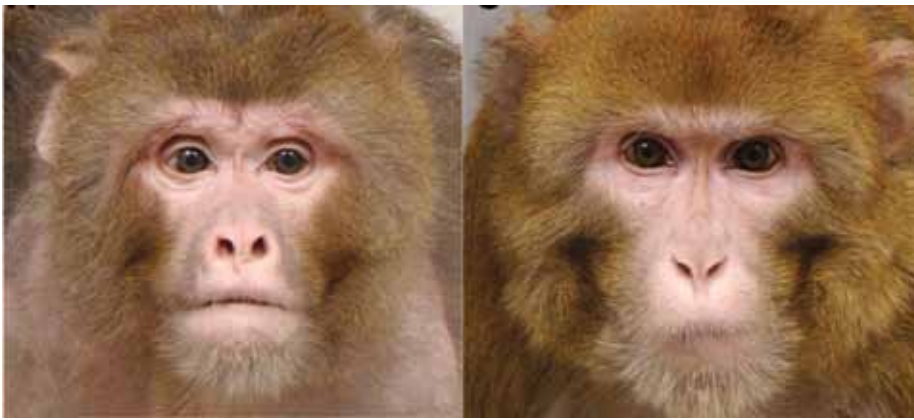
would that be worth trying? OK, Stalin may have had a valid point about millions of deaths being statistics rather than tragedies. But it's not hard to spot tragedy caused by aging: aging will kill your parents, and will force your children to watch you grow senile and forget who they (or you) are. They will likely watch you in a hospital bed that eats away a BMW-sized chunk of their savings every month², and when you are gone will feel the absence of one of the most important things in their lives.

Seeing aging as a problem is of course not new, and throughout history different people have tried different methods to avoid it. But the scientific method, which

has been so rewarding for us modern humans, has only been applied to aging for perhaps sixty or eighty years. And in fact, in the last two decades researchers have been able to slow down the aging process through genetic manipulation, drugs and environmental factors³. Almost all such work happens in model organisms (mainly worms, flies and mice), because they allow genetic modification and have short enough lifespans to make controlled experiments possible. This lack of anthropocentrism should not discourage us, however, since the same is true for almost all biological research and drug development. We are in fact surprisingly genetically similar to other animals: even fruit flies have parallels for ~75% of genes involved in human disease, and the biological pathways are even more conserved in terms of function. Thus aging is now *de facto* a modifiable property of organisms, though this has yet to be properly demonstrated in humans.

Despite this progress in understanding and modifying the process of aging, there is no clear-cut definition of *precisely* what aging is. This is in large part because the symptoms of aging (such as wrinkles, or age-related diseases) are often conflated with the underlying biological process⁴. In the research community, one currently favored definition is "loss of the body's





capacity to return to homeostasis after environmental insult.” A more traditional definition might be “comprehensive and progressive decline of physiological function,” and this conveniently serves as a decent working definition to distinguish aging from specific symptoms: does a given treatment alleviate a broad spectrum of symptoms, or just a few? And moreover, does it affect “normal” individuals, or only those suffering from a specific disease? Another reason we don’t have a clear definition is that we still don’t know exactly what causes the human body to decline with age. A number of theories have been proposed over the years: some have fallen by the wayside, while others remain popular despite evidence that they do not offer a *complete* explanation for the aging process (e.g. free radicals, or telomeres). More likely aging is multifactorial, although the different factors may converge on certain biological processes. Work is ongoing to identify measures of physiological age (as opposed to simple chronological age), of which DNA methylation has shown the best results so far.

Aging may seem universal because the animals we most commonly interact with (cats, dogs, livestock) go through much the same process as humans, albeit much faster. But there are many examples in nature of qualitatively different aging: tortoises can live much longer than humans, but more importantly their rate of mortality does not seem to increase over time. In other words they do age, but as far as we can tell they don’t undergo the same process of deterioration. Note that this doesn’t mean they never die, just that their probability of staying alive and healthy is constant year to year. This may also be true of lobsters, who also do not seem to lose fertility with age. Though less attractive, opposite examples

also exist: salmon and octopi mature, reproduce and then die abruptly rather than undergoing a gradual decline. Perhaps more remarkably, aging is not strictly a unidirectional process: some members of the *turritopsis* and *hydra* genuses do grow old and decrepit, but are then able to return their entire body to a youthful state. Axolotl salamanders and planarian worms are famously able to regrow large parts of their bodies, which is a similar process of turning old cells into young ones. Indeed, from a biological rather than individual point of view, humans routinely perform the same feat: the egg of a middle-aged woman has the capacity to produce a complete human body where all signs of aging have been erased. Similarly, the 2012 Nobel Prize in physiology recognized the demonstration that any cell in our body can be turned into a stem cell. Rejuvenation is thus biologically possible in humans, though we are still far from understanding the barriers that keep it from happening in our adult bodies.

The media can sometimes make it seem as though there’s a focused effort by brilliant scientists to solve the problem of aging (and all other problems, for that matter). Unfortunately that’s far from true. The biogerontological research community is growing, thanks in part to aforementioned progress, but is still very small. I don’t have actual numbers, but I would guess the number of researchers is on the order of

thousands. That is, comparable to a single mid-sized company. As another way to size things up, the National Institute of Aging is by far the primary source of research funding in the US, and has a budget of just over a billion dollars. ~20% goes to non-research expenses, and about a third of the remainder to social and geriatrics research. So we’re left with ~0.6 billion dollars. This may sound like a lot, but it is only ~12% of the National Cancer Institute’s budget (even though aging is the biggest risk factor for cancer). The military budget is more than a thousand times larger, but perhaps more critically the total US healthcare spending is at least one hundred times the *entire budget for biomedical research* (of which the biology of aging is ~2%). This despite the fact that a huge proportion of the healthcare spending is due to age-related diseases². I won’t discuss this allocation here, but simply emphasize that the cavalry is not on its way. A smallish number of researchers are working pretty hard, but regardless of their talent and effort scientific progress is not straightforward; the fact that you’re in unexplored territory inevitably implies many false starts and detours. With the current setup, real progress on avoiding the problems of aging is likely to be slow.

In summary: Negligible aging is biologically possible. Barring extinction of the human race, we will eventually turn the implausible-but-possible into reality, as we have for such miracles as flight, space travel and wireless communication. Whether this will happen in 50 or 5000 years is impossible to say for certain, because it depends both on our efforts and how many unknown unknowns we run into. At present only a minority of research is aimed at modulating the rate of aging itself, with the majority addressing individual age-related diseases or trying to understand specific cellular mechanisms that seem to be involved in aging. Some would argue that this should change, although such research is



undeniably providing clues about aging itself. Regardless of allocation, more resources directed at this problem would unquestionably accelerate progress⁵.

But what if we were to get there? What if we developed technologies that eliminated disease and death completely. In reality there would never be such an abrupt switch, but rather a continued development of things that add a few months or years of healthy living (as we have already been doing throughout modern human history). Thus one common fear, that life extension would mean additional years of frailty and sickness, is rather unfounded; speaking as a biologist, it's simply inconceivable that we would continue to find ways to keep a profoundly broken organism alive. Modern medicine does have tools to sustain life at its very end, but although the emotional impact of these final days is great, the actual period of time is tiny compared to the added years granted by treating disease in mostly healthy individuals. Come old age and multiple morbidity, the effectiveness of treatments drops drastically. And indeed the premise of research into aging, rather than specific age-related diseases, is to slow down the process that causes such diseases and thus maintain the youthful state.

So we can rest assured that the fate of Tithonus is not a realistic consequence of aging research. And as I've addressed in another post, neither is overpopulation. So these common fears are actually not things we need to worry about. But of course there *are* a number of likely consequences from significant life extension, some desirable and others challenging.

The most obvious, perhaps to the point of under-appreciation, is that we would not suffer the loss of loved ones. But beyond the obvious, the vacuum left when someone passes away extends beyond personal loss; in the modern world, what you learn is indubitably a greater factor in your ability to contribute to society than is the infinitesimal genetic improvement that comes with being part of the next generation (in fact I would argue that genetic evolution is no longer applicable, but that's a separate post). Particularly if we subscribe to the notion of combinatorial creativity, a person who continues to accumulate knowledge and is not subject to dementia or other debilitating effects of aging would perpetually and increasingly outpace even genetically superior persons

that suffered from a complete knowledge reset every few decades.

And this effect of keeping everyone healthy and active would be on top of the direct healthcare savings that would follow from reducing, let alone eliminating, age-related disease and infirmity (recently estimated to be trillions of dollars, just from the effect of currently available drugs on animal models). It's highly possible (and discussed elsewhere) that the current demographic trajectory will lead to the collapse of traditional retirement plans in the foreseeable future, which would evidently be alleviated by simultaneously preserving people's ability to do useful work and reducing their demand for healthcare. But honestly this is a bit misleading, because if we did not age there would almost certainly not be a concept of 'retirement' involving indefinite cessation of productive work.

This is an example of something that *would* be a radical and not strictly positive change in a post-aging world. On the other hand, if we remember that we would not be 'worn out' at this age, it's not necessarily strictly negative either: The basic premise would be the same as now, that we work enough to support periods of non-work. We would only be changing the timing and frequency of such periods (which some people already do). At present, it is very rare for people to have more than one or two careers; there simply isn't enough time to get good at many things. But if "retirement" meant some years of complete separation from your profession without any acute loss of ability to support yourself, you might decide to go in a different direction upon reentering the 'active work' phase. Without physiological decline, you would be able to have as many or as few careers as you had appetite for. And here's it's worth noting that physiological decline is not limited to disease: Post-aging, we (women especially) would no longer need to balance the choice of parenthood against building career capital or pursuing other life goals. While I'm not qualified to offer personal experiences here, I would estimate having the option of raising children whenever it suited your lifestyle of inclination to be exceptionally liberating. And breaking the confines of our biology in this manner would empower more than reproduction: no longer would professional sports (or dance, or military service...) be the

exclusive realm of people in the early stages of life.

Of course, opening up such possibilities would break some of the assumptions we currently make in social interactions. Unable to correlate wrinkles with wisdom, we would have to do a lot more research to discover other people's situations and perspectives. There would likely be serious (or complete) dilution of recognizable 'life stages', and quite likely we would have fewer spontaneous instances of social groups with a shared identity (e.g. college). The 'elders' of a family would not be easily recognizable for outsiders, and without attrition families might expand indefinitely (albeit likely much slower). It's hard to predict how our ties to blood relations separated by many decades of experience might feel.

Returning to more tangible issues, one challenge that would be alleviated by extended lifespans is that of absorbing the ever-increasing sum of knowledge in the world. In 1940, ~25% of Americans finished high school, <5% college. In 2014 those numbers were 88 and 32% respectively. Even since 2000, the fraction of US population with at least a college degree has risen from 25% to 33% (and graduate degrees from 13 to 18%). The average age of college attendance is also rising. In other words, the part of our lives deemed necessary for meaningful contributions to society keeps increasing. One solution (which is already taking place) would be increasing specialization, in other words allowing ourselves to be ignorant in many areas. But if we don't want this taken to extremes, either our lifespan or rate of learning must be increased in pace with the amount of information worth knowing.

On the other hand, I sometimes hear the objection that with endless time we would end up trying everything and grow bored. This does not seem relevant, for the simple reason that the human race is creating faster than any individual's capacity to consume⁶. More than a million books per year are published in the US alone, so to even stand a chance of running out you'd have to read three thousand books per day, under the incorrect assumption that the output won't continue to increase. Similarly, there is no real end to creative processes, nor to improving your ability in whatever area. Certainly you could grow bored of it, but not because you "finished."

A more plausible objection is that without new blood there would be a dearth of innovation and creativity. This does seem to be a general trend, although it is not without exceptions; I think *Tempest* is an excellent album, and Dylan was 71 when he put that out. Plenty of examples exist in other fields as well. I don't really have any hard data on this topic, and would not venture to explain what drives creativity in people at any age. But I wonder to what extent a drying up of ideas could arise from a choice not to get into new things "this late in life"...

At this point we've covered a lot of possible consequences, so let me conclude with a few short answers to objections that I hear with some regularity:

Curing aging is unnatural: Only if you don't consider humans and the things we make to be part of nature. Either way, the same argument is equally applicable to correcting poor vision or brushing your teeth. Or to wearing clothes, for that matter.

With endless horizons, we would not be motivated to do anything: Possible, I suppose. But as far as I can tell, a decades-off demise doesn't really seem to guide our daily routines. Overwhelmingly, our actions seem to be motivated by "*I want people to admire me,*" "*All my friends are going to college,*" "*This person is nice/mean to me,*" "*I want that person to get naked with me,*" "*That*

guy makes more money than me" ... Americans work an average of 47 hours/week, even though less than a third of this would provide food and shelter. We compare ourselves to our peers, and compete for whatever is scarce. When material needs are fulfilled we eagerly compete for scarce intangibles, such as love or fame. And the absence of death would not change this.

Curing aging goes against God's plan: I am still unable to understand how anything we humans do could legitimately challenge an omnipotent God. If (some) God exists and this goes against his plan, then our attempts will simply fail. No need to worry.

"Death does not concern us, because as long as we exist, death is not here. And when it does come, we no longer exist": OK, this argument from Epicurus was not actually delivered to me in person. The idea persists, though, and it may even be well-founded. But accepting it does not imply that we shouldn't seek to make each of our future moments of existence as desirable as possible (which Epicurus would no doubt have agreed with). Whether or not we consider death to be part of our life, curing aging would make the experience better.

To summarize this section, most of our worries arise from imagining a future without aging but absent any other changes

from the societal structure we have now. There is no question that things would change drastically if we cured aging. But this cannot be used as an objection, because society is certain to undergo drastic change regardless. Moreover, drastic societal changes were also incurred by codes of law, the steam engine, computers, the internet... Yet now that the damage is done, few of us would want to return to the society that preceded these changes. In some cases we can fairly imagine that change would have been resisted if the full consequences had been known in advance (e.g. pollution post industrial revolution), but nobody is suggesting that we reverse even these examples.

If you happened to be born female a few hundred years ago, your lot in life was to be pretty, perhaps play an instrument, and hope that whoever you were married off to wasn't abusive. From our present perspective, this lack of choice seems utterly barbaric. Now imagine that you are restrospecting from a future society that has cured aging: would our lack of choice regarding sickness and death be considered similarly barbaric? ■

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1. Age outshines even diet (saturated fats etc.) for heart disease, although for diabetes it is second to diet in importance. For lung cancer smoking is a bigger risk (with aging 2nd), but aging is #1 for cancer as a whole. For the various neurodegenerative disorders and dementia there's absolutely no comparison. And of course there are a miscellany of non-lethal diseases where aging is also the biggest risk factor (e.g. arthritis).
2. In terms of society, on average about 20% of lifetime medical costs (including birth-related) occur before age 40, ~30% between 40 and 60, and half after age 60.
3. The size of the effect is generally larger in simpler organisms. In a somewhat reliable organism, mice, genetic manipulation (of growth hormone pathways) has doubled the healthy lifespan, drugs extended healthy life by ~10% (Rapamycin, Metformin) and caloric restriction 30-40% (although there's controversy about whether this effect is specific for inbred strains of lab mice).
4. Not a single "anti-aging" cosmetic sold by under well-known brands has any effect whatsoever on aging. Some may remove wrinkles, but that's like saying that morphine cures cancer because the pain disappears. Some existing drugs (e.g. rapamycin, possibly NSAIDs) may affect the aging process, although they are not sold for this purpose. A huge number of supplements claim to affect aging, and the vast majority are undoubtedly bogus. A few are based on legitimate scientific studies, though without human studies it's not clear that they will work as advertised (nor what the relevant dose is). I should note that aging is currently not recognized as a disease by the FDA, which means that one could not get a drug targeting aging itself approved for sale. It is possible that the first effective drugs against aging will be sold as supplements until the regulation changes (though it might change rather quickly if we have something in hand that clearly works).
5. One successful example of this kind of impetus is the Apollo program, where a large influx of funding and manpower in the 1960s allowed the US to leapfrog the USSR space program.
6. This ever-evolving world also discredits the concern that a post-aging human race would stagnate due to a lack of natural evolution. I will go over the details in a separate post, but in short the fact that the modern world now changes much faster than our reproductive cycle means that the mechanism of Darwinian selection is approaching irrelevance: increasing the successful reproduction of individuals whose genetics are better suited to the environment will not improve the next generation when the environment that the child grows into is very different from the one that favored its parents.

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Greetings to *ALL Young Cryonicists*,

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

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our getting to know you and
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Some individuals are social butterflies. This is not so for everyone. And we want everyone to meet everyone. Therefore, I have designed a diverse range of “getting to know you” activities. IF you would enjoy participating in these various getting acquainted activities, THEN this is for you.

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Membership growth has been slowly accelerating since bottoming out in 2013. But we would benefit from faster growth. Alcor is now at a point where we could enjoy considerable economies of scale: We could manage many more members with minimal or no increase in staffing costs. That would enable us to *reduce membership dues* while building up our resources. A modest acceleration in membership growth would move us into a virtuous circle where growth enables reductions in dues which further spurs membership growth. Growth will also make it easier to hire highly skilled people in medical and technical areas.

The most effective way to bring in new members has been through direct encouragement by existing members. Many of us realize this, but may not make it a priority to nudge our friends a little more to sign up and potentially save their lives. How can we spur more members to gently persuade those they care about to move ahead with making cryonics arrangements? Perhaps some financial incentive will help.

Anyone who is primarily responsible for getting a new member to sign up will, at their request, be given a one-year waiver of membership dues.

For an existing member to receive the dues waiver, they must (a) be credited by the person who has signed up; (b) ask for the waiver; (c) not be otherwise profiting from the signup; (d) wait until the new member has completed all essential cryopreservation paperwork and has paid at least six months of dues; and (e) the new member must not be a member of their family. If the member signs up two new members, they are eligible for a two-year waiver of dues. If the new member is a student, the existing member is eligible for a waiver of six months of dues.

Who do you know who could do with some encouragement to sign up? Please, give it some thought, then help yourself and help the organization by helping to stimulate membership growth. Bring in one new member per year, and you will never pay dues again!





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In 2003, the **Life Extension Foundation**[®] introduced a standardized **resveratrol** extract shown to favorably alter genes implicated in the aging process—many of the same genes that respond to **calorie restriction**.

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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.

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CRYONICS IN EUROPE: SOME HISTORICAL HIGHLIGHTS

By R. Michael Perry



Cryonics started in the United States and still has most of its following and activity in this country. It is well stated, however, that death is international in scope, and the movement to combat it by cryogenic storage has also taken root in other parts of the world. Here we take a look at cryonics in Europe, starting in the 1960s and extending to more recent events such as the formation of KrioRus, the first European cryonics organization, in 2005. Over such a long period we can really only cover some highlights but will aim for more interesting items, with emphasis on earlier times.

STARTUP

The cryonics movement had two principal originators, Robert Ettinger and Evan Cooper. Ettinger's main early milestone was his book, *The Prospect of Immortality*, commercially published by Doubleday in June 1964, which widely publicized the idea that persons should be cryogenically preserved immediately after clinical death for eventual reanimation. Cooper also independently wrote a short book, *Immortality: Physically, Scientifically, Now*, which paralleled Ettinger's, but was never commercially published and for a long time was difficult to obtain (now it's online¹). Cooper, however, accomplished something crucial to the early movement that no one else did. His Life Extension Society (LES), dating from late December 1963 and based in Washington, D.C., was the first organization promoting the cryonics idea and the first to have conferences and publish

a newsletter where like-minded people could communicate as they developed their own organizations and approaches. (The term *cryonics* itself wasn't coined until mid-1965, initially for the Cryonics Society of New York (CSNY); within a few years it had spread to more general usage.) The first issue of the *Life Extension Society Newsletter* appeared in January 1964. (With the January 1965 issue the rather prosaic title was changed to *Freeze-Wait-Reanimate*. There it remained until publication ceased with issue number 60 dated September 1969.) Interested individuals, some of them in other countries, read and contributed to the newsletter, or otherwise heard about the practice, and cryonics groups began to take shape elsewhere.²

The first appearance in the newsletter of a contribution from outside the United States was in the September 1964 issue, from a Welsh telecommunications worker and science fiction writer named Gerald Evans. Here quoted as printed (with occasional ellipses, corrections of typos, and the like, as elsewhere in this article; see note following Sources), the letter offers a lively, apparently independent synopsis of Ettinger's basic thinking from another sharp mind. (Evans doesn't refer to Ettinger's book and does not appear to have read it.)³

Dear Ev Cooper,

Thank you for the copy of Life Extension Society's Newsletter. I am very interested in your freeze and wait idea. If science

will continue to progress at its present pace, and I see no reason why it would not, sooner or later, either the bio-chemists or other medical scientists will achieve a break through into sustaining human life beyond its present paltry period of existence.

It seems to be that we who are alive now are rather unfortunate in being born about a century too soon. This idea therefore of freezing the newly dead human body and storing it ready for future scientists to re-animate is a bold, imaginative and courageous suggestion.

However, whilst your society are enlightened on this conception, it may be well to consider some of the objections of those who will oppose it.

(a) The expansion of the earth's population up to explosion dimensions might well deter any scientists of the future re-animating stocks of millions of frozen bodies to add further to the protoplasmic congestion of a groaning planet.

(b) Unless there is some protective continuous

organization set up, dedicated with a fanaticism to see that stored bodies are brought back to life, we might be trusting posterity too much to do the necessary for frozen lives.

(c) The bodies that are frozen must be bodies that are not too mutilated by disease. Brain cells can be so damaged before death for instance, that on re-animation the person would be an imbecile. Still, it can be argued in this case that a science that could bring back life to frozen dead could even look after a problem like that.

(d) Storage space for millions of frozen bodies may also prove a problem, but there is always the Arctic and Antarctic--incidentally the low temperature of these regions would be a "natural" for the grave yards of the deep frozen bodies.

(e) There will be strong opposition from religious organizations who believe in "pie in the sky" after death as we move around in bodies made of fog. Perhaps these people can be answered best by agreeing that if they are right, then our scheme will fail, as future science will not succeed in bringing us back to life if their primitive belief is a correct one. So why should they interfere with us?

(f) The vultures who now bury us may lose a lot of revenue, and will oppose, if freezing and storage can be done more cheaply, on the other hand, it may be more costly and those creatures will take it over as a new and better money spinner.

(g) Some difficulties could be created if a married man dies at thirty (and is frozen) and later his wife dies at eighty (and is also

frozen), for on re-animation he could not expect a great deal of glamour from his wife. A father could die at thirty and his son at ninety. Who then be the father on re-animation?

I have listed these obstacles; because in your campaign they will have to be faced. Perhaps (g) at least could be answered in the belief that these future scientists will be able to average out the age of anybody to say late youth. ...

Please let me hear from you again. Could you tape your next conference, or, at least high lights from it? ...

Very best wishes and great success to your project. Yours sincerely,

Gerald Evans
(Swansea, Glamora, [Wales,] Great Britain)

Another early indication of cryonics activity in the U.K. was this short notice by Cooper in the July 1965 issue:⁴

NEWS OF BUDDING FREEZING FACILITIES IN ENGLAND

Our LES Coordinator in Hull, England, Alan Worsley, reports that he is now "on telephone" and will attempt to do his best to freeze anyone in need provided they help him manage the costs. He suggests that as a university research fellow his salary doesn't allow him to be so reckless as to offer free freezing. However, he has ordered a refrigerator for experimental purposes and his advice will be free. Heartfelt thanks are in order for Alan's great effort.

Shortly after this, in the September issue, there was electrifying news:

ASTOUNDING ADVANCE IN ANIMAL BRAIN FREEZING AND RECOVERY.

Dr. Isamu Suda and colleagues, at Kobe University in Japan, had detected electrical activity in a cat brain that had been frozen

to -20° C (-4° F) for more than six months and then restored to body temperature. The cat had been anesthetized and the brain removed. The blood was replaced with a protective solution of glycerol prior to freezing; the glycerol was again replaced with blood on rewarming. Not only did the brain revive and resume activity, but the brain wave pattern did not appear to differ greatly from that of a live control. The following month (October 1965) there was further confirmation:⁵

The report last month that the brain of a laboratory animal had been perfused, frozen for six and one half months and revived to the extent of having a good EEG, [was] almost too good to be true. We feared it might be a hoax or an exaggerated account. For if the report were true it would probably be the most dramatic cryobiological advance since Dr. Audrey Smith froze hamsters to -5°C, stiff as cardboard for an hour, and revived them with long term survival. The report now appears to be true in its rough outline with a confirmation and short report from Prof. Suda.[...]

The following year the Suda experiment was reported in the well-respected science journal *Nature*. A few months later, in the January 1967 issue that reported the freezing of James Bedford, the first cryonics preservation under controlled conditions, Cooper further reports on Gerald Evans' activities in England.⁶

With the headline "Freeze-Wait-Reanimate" Geoffrey Moorhouse writing for the prestigious British weekly, the Manchester Guardian, interviews Gerald Evans our LES coordinator for Swansea. In a very casual good natured way Mr. Moorhouse discusses the main ideas with a flourish and then some of the possibilities for Britain.

"Unlike a lot of visionaries he can also see a lot of obstacles in his path. He would like to hope that the

Life Extension Society will become an extension of the National Health Service, with bunkers up and down the country full of encapsulated people (they can hardly, in this condition, be called corpses) awaiting reanimation. And if this is not practicable there are always the unpopulated spaces of the Arctic and Antarctic, heaven-sent, you might almost say for this very purpose.

"He can imagine the day when the cryobiologists will not only be able to reanimate but rejuvenate as well; they will be able to give us back not only life but what Mr. Evans calls 'the fire of 30.'"

Readers of our newsletter will remember Gerald Evans as a frequent contributor including a long write-up in our November issue of Prof. Suda's deep freeze cat brain experiments. His work is with the G[eneral] P[ost] O[ffice] in Britain, but his avocation has always been with new ideas, writing about them in science fiction and science journals and now acting upon them. A letter of his that follows [...] tells of some of the results of the Guardian story including a television program in London.

Here is Evans' response, in his usual lively, informative style. (Readers may note that the date of the Frost Program referred to in the letter is the very day of the Bedford freezing, now celebrated as Bedford Day by observant cryonicists.)

Dear Ev,

Now for the news. The Guardian Newspaper publicity led to the best television plug for LES so far in this country. I appeared in the FROST PROGRAMME with David Frost and Dr. D. E. Pegg, a specialist on low temperature biology, on 12th Jan. 1967. This was a London only transmission, but one

of the programme editors claimed that it reached an audience of over 5 million. [...]

One of the most sensational results that came out of the programme was when Frost asked the live audience of some two hundred people to indicate how many of them would follow me into freezing after death with the hope of possible reanimation some day. To my amazement twelve people put up their hands. [...] So 6% are with us! It sounds promising.

Dr. Pegg, who was on that Twenty Four Hour programme of the B.B.C. last year, put in some deglamourising material against me. He said that our claim of hamsters being frozen at -5 degrees C was wrong--it was -1 degree C. He even downplayed Suda's success with the cats' brains.

I think I upheld our flag however. I said that quite a few scientists believed that Freeze-Wait-Reanimate was possible and disagreed with Dr. Pegg's pessimism. Dr. Pegg has asked me to provide him with the names of these scientists and he said that he would write to each one personally.

Earlier in the show, I made the following points which I think helped to tarnish Pegg's merchandise of gloom and death. I said that Dr. Audrey Smith [...] by writing in the Penguin Science Review "that she did not think biological immortality would be available through deep freezing during our life times" [had] implied that it was however possible, and that coming from a British scientist was hopeful indeed. I reminded the TV audience of traditional British scientific gloom, the worst instance of all being the

statement by the Astronomer Royal back in 1958, [when asked] what he thought about space travel[, that] "it was all bilge!"

We had quite a party after the show. Rediffusion Television are fine to their guests. They gave me a wonderful welcome. The intellectual atmosphere generated by other guests removed all inhibitions. I felt that at last I was in the company of "free minds." I felt too, for the first time, that some people really want LES to succeed, and are tired of intellectual timidity and religious childishness. [...]

Dr. Pegg was quite friendly to me off the air, and I showed him NATURE'S article about Suda's experiment, and asked him if he questioned the accuracy. He said that he had found some errors in the past. You can't win can you? But whether they like it or not--Prof. Suda has shaken Western science and the LES can go forward with confidence.

Sincerely,

Gerald Evans, Swansea,
Great Britain

FRANCE

Here we backtrack a bit. Cryonics in Europe really began in France, though the French didn't start making the pages of the LES newsletter as early as the English. But they were more proactive over all, and started their own organization when finally they were frustrated with LES, then another organization when frustrated with each other; and published newsletters. LES at least *was* instrumental early on. In the spring of 1964 a photographer named Marc Collet living in Rosieres-aux-Salines near Nancy read an article in the magazine *Science et Vie (Science and Life)* which focused on *The Prospect of Immortality*. An exchange of correspondence with Ettinger brought Collet in touch with Ev Cooper, who named him LES Coordinator in France in January 1965. An article in *Science et Vie* in April

that year carried Collet's address. Several people wrote to him and soon a chapter of LES was formed with Collet as president and Andre Chareyre, a general semantics teacher and mentor of a group of non-aristotelians in Paris, as vice president.⁷ The June 1965 *Freeze-Wait-Reanimate* carried this notice:⁸

Marc Collet, our LES Coordinator in France, has been most active investigating freezing costs for the more expensive liquid nitrogen freezing, and being interviewed by the French scientific journal Science et Vie. The following are translations of Marc Collet's words as published by Jacques Ohanessian in Science et Vie.

"I am sure that tomorrow men will be capable of resuscitating the people that will have been properly frozen. Of course, the first experiments will be doomed. The way is a long one, but why not start now? I am trying for this reason to assemble around me all the good will possible to bring about an organization for freezing on a high scale. I have contacted several French enterprises of the cold industry. The financial problems are almost insoluble. To freeze one person would cost about 30 or 40,000 francs, plus 3 or 4,000 francs per year for the upkeep. But if the practice became widespread the prices would decrease considerably.

"There is no doubt hope. No one denies it. Therefore why should we let such hope escape? What is the risk?

"As for myself, if by carelessness I did not have a member of my family frozen upon death--for which of course I do not wish--I would have the feeling that I am committing murder. Some of your readers will probably believe I am crazy. I believe I am reasoning logically, on valid scientific hypotheses.

Because the scientific bases are real."

A further tribute came two months later:⁹ Marc Collet, LES representative in France, continues to be irrepressible. He continues to get articles about freeze-wait-reanimate and LES in the papers. He continues to gather in new members and would enjoy visiting with LES members who come to Rosieres-aux-Salines from other parts of the globe. Write to him in advance, of course, and in French if at all possible. Collet has also been traveling throughout France meeting with people who might be helpful in the freezing movement. We cannot thank him enough for the



Marc Collet¹⁰

tremendous amount of work he has done.

In the end, though, according to Anatole Dolinoff, another early French activist, Collet's group "failed to launch a viable program, although membership cards and testamentary forms were printed." In October 1965 another French LES group formed around Roland Missonnier, a 22-year-old cosmetic salesman in Lyon. In 1966 Missonnier published two issues of a cryonics newsletter. Meanwhile there was a further enthusiastic writeup in the March 1966 *Freeze-Wait-Reanimate*, shortly before someone was finally frozen with some thought of reanimation.¹¹

FRANCE EXPLODES WITH
YOUTHFUL, ZESTFUL LES
ACTIVITY

In Paris, Andre Chareyre says good-bye to his LES Coordinator's position

and desires to be frozen immediately. Andre is a handsome vigorous 33, with an unimaginably beautiful wife of 24. He is working on his doctorate at the Sorbonne in psychoanalysis and is interested in politics. But considering everything he wishes the honor of being the first person frozen. Considering everything, his wife agrees.[!]

Turning for a moment to Lyon, Roland Missonnier, LES Coordinator, has made an immediate conquest of the press. He has been instrumental in getting at least five newspapers to carry a long article about the freezing possibility, and radio broadcasts which have carried the idea to both areas in France and [in] Germany. Friends and others interested have been formed into a group of a good dozen for Lyon and surrounding region.

If Lyon is bursting into flower, LES in Paris is distraught, agitated, and at sixes and sevens. There are various reports, all of which are not clear. However, if we understand Chareyre's position and suggested program it is as follows: 1. LES and the freezing forces should make a whopping frontal attack on the Catholic Church--and various other major parties. 2. There should be a general language reform along the lines of General Semantics. 3. As long as LES is so slow and pokey a separate French freezing formation should be created to implement the objectives above. 4. Andre Chareyre wishes the honor of being the first person frozen and offers to do this immediately.

Some of our more suspicious LES readers will jump to the

conclusion that Chareyre has a radical or possibly Communist approach. However, according to today's Washington Post the French Communists "offered the Party's hand to people with Christian beliefs" and "respect for the convictions of every one." French politics are very confusing.

Marc Collet, who heads LES coordinating activities for France, suggests that although Chareyre's offer to have himself frozen is generous, freezing is only a last chance alternative. It would be better not to be a guinea pig at this time when the state of the art is so little advanced. Freezing is advocated for those who are immediately faced with death or who have just died, but not for those with years of life ahead of them. LES policy should be based on reason and scientific hope, with full recognition of the dangers, but not on romanticism.

Several LES officers in Washington, with no knowledge of French politics, nevertheless observed that if the new Parisian freezing forces did overwhelm the Catholic Church and the major political parties, that would take all the life out of French politics and religion. Then where would Andre Chareyre be?

In the next (April 1966) issue: "Andre writes that his suggestions on policy are nowhere near as drastic as described in the previous newsletter. Added to these misunderstandings, Chareyre's father is now very ill. We hope that Chareyre continues with us and that his father's illness can be alleviated and cured."¹²

Chareyre himself responds in a letter that appeared in the June issue, written before receiving the news of the freezing ("Someone Has Been Frozen at Last," May 1966 *FWR*).¹³

Paris, May 3, 1966

Dear Ev,

It is with great sorrow that I write of my father's death, on the night of April 21, following an embolism. I never thought it would be so quick. His body has been inhumated in a little cemetery in the village where he lived.

For me, who do not believe in death, it has been a harrowing experience. If luck would have had it that we be equipped with cryogenic material, I would have been able to save my father.

This brings me to consider a reality we cannot elude. What good is it to inform people through the press if we do not have the technical means to give tangible proof of our works' conclusiveness? To this day not a single person has been frozen. And how would that be as long as we do not create "frigorific dormitories"?

Rather than talk, wouldn't it be better that we unite ourselves to gather the funds needed for the creation of our enterprise? If we wait for generous patrons to come forward, don't we run the risk to see a number of ourselves be entombed when the day of our death comes?

The Mormon people have been able to hoard up a huge fortune by establishing regular monthly dues (10% of salary). Why not do the same? Don't you agree that this course of action would be a beneficial addition to that of public information?

At the moment, we are representative of a new minority in a world running to its end because it is a prisoner of an antiquated and obsolete valuation (i.e., man is mortal).

Our minority must become strong, structured, organized.

Our mission is to awaken consciousness deluded by ancient negative philosophies.

We are not born to die. I am trying to teach this through General Semantics. Naturally, I have to face enormous difficulties. But the world wasn't made in a day. .../...

I would now like to [...] straighten out a few aspects of what was written about me in the last newsletter.

1. I don't think I have ever told you, in any of my letters, that a frontal attack should be opened on the Catholic Church and other influential groups. Since you have written it, you must have heard it somewhere else. Followers of Korzybski, the father of General Semantics, do not attack anyone, and on the contrary, regret that men fight each other. I merely told Marc Collet and Roland Missonnier that in the case our thesis did not agree with that of Church and political parties, complications were to be expected. To avoid this, we had to be on the look-out.

2. I do advocate language reforms through General Semantics (see the trouble we have in understanding each other in our letters) to the extent it would widen our vision of human life and would bring men to this brotherhood they talk so much about but haven't as yet acquired. The training received from earliest childhood conditions the least of our behavior. When we think we are acting, we are in fact being acted upon. I've had this experience a few days before my father died when talking about the freeze and reanimate program. Those who were listening, simple, friendly, amicable

folks from my father's village reacted in a way which left little doubt as to the judgment they held on my words. At any rate, not one of them came up to sign the freeze card. The words we use are not the things. To convince people, we must act and not talk.

3. It is correct that I've volunteered to be frozen ... but there is nothing romantic or generous about this. Not any more than I consider myself a guinea-pig. Or in that case, [astronauts] Glenn, Sheppard, Gagarin, Leonov, etc. ..., also are romantics and guinea pigs. Please, dear Ev, do not believe that I shall jump in the ice, eyes closed, yelling "Long live LES." In the case where my offer was to be accepted, I would require all care was taken to give me a chance to come back as soon as possible. Also, the experiment would have to be carried under international scientific control. Where do you see any romanticism there? ...

I won't sign off without thanking you and all of our LES friends (Collet, Dr. Leclerc, Mr. Hope, Mr. Ettinger, etc ...) who have helped in the ordeal I had to face.

Act quickly to create in the world "frigorific dormitories" ... so that soon sons will not mourn their fathers gone in death. .../...

All my thanks, and endless best regards.

Andre Chareyre--
Paris, France

The frustration with the slow pace of LES continued, however. Dissatisfaction with the organization had led Saul Kent and others to form the Cryonics Society of New York in July 1965. With encouragement from Kent, Missonnier formed the Association Cryonics Francais

(French Cryonics Association, ACF) in December 1966. Missonnier himself was president and Andre Chareyre vice president, but soon the leadership began to change. Chareyre resigned and left the organization in September 1967. His place was taken by Anatole Dolinoff, an engineer and teacher of chemistry and physics. Missonnier published three issues of *Cryonics Nouvelles* (*Cryonics News*) in 1967, with articles mostly translated from CSNY's mouthpiece *Cryonics Reports*. There would be five more issues through 1968 into early 1969.¹⁴

Dolinoff, for his part, purchased a typewriter, mimeograph machine and copier for ACF activities, and subsequent meetings were held in his living room. He constructed a wood and aluminum temporary cryonics storage unit lined with polystyrene, and, in 1968, published ten detailed committee reports. Among the other principals in the organization were Dr. Guillaume Roy, a specialist in alternative medicine; Dr. Raymond Martinot, an assistant physician also licensed in atomic physics; and his wife, Monique Martinot-Leroy, a mathematics teacher. In 1968 Dr. Roy obtained the right to carry out the initial stages of cryonics procedures, a difficult matter in France where law required nothing be done until 24 hours postmortem. (The law could be circumvented in special circumstances, for example, for organ donations, and it appears this is what the cryonicists were counting on.)

A talk was organized and given in Geneva, Switzerland, 18 September 1968, under the theme "Principles and Fundamentals of Physical Survival by the Method of Suspended Animation." A writeup was given in a local paper, and Dr. Roy, the main speaker, was invited to another speaking engagement nearby.¹⁶ All was not well organizationally, however. A dispute over a wealthy patient of Dr. Roy



Board of Directors of the French Cryonics Association (ACF) 25 Feb. 1968. From left: Anatole Dolinoff, Jacques Laure, Guillaume Roy, Roland Missonnier.¹⁵

who was interested in being frozen split the group. Dolinoff and 12 other ex-ACF members formed a second organization, the Societe Cryonics de France (Cryonics Society of France, SCF) in January 1969. Dr. Martinot became the new president of ACF, and Missonnier the general secretary.

ACTIVITY OUTSIDE OF FRANCE

Outside of France cryonics activity burgeoned in 1968, in a limited way. Dr. Ernst Fasan, an Austrian attorney in Neunkirchen, met with Dolinoff after corresponding with Ettinger and meeting the CSNY leaders in New York. He proposed creation of a for-profit company. In Munich, Germany, 31-year-old Rudolf Burkhart founded the Deutscher Cryonics Club (German Cryonics Club, DCC) on December 23, 1968 with his brother, a nuclear physicist, as Technical Director. In Barcelona, Spain Jorge Blaschke, a 26-year-old astronomy student, founded a Spanish Cryonics Society with himself as president. Because of archaic Spanish laws and traditions they feared there would be serious barriers to cryonics in their country. In England Gerald Evans, Brian Blair-Giles, and V. Reed had shown considerable interest by late 1969, as had an engineer, Iginio Tansini in Milan, Italy, yet no cryonics societies had evolved in these countries.

FUTURE PLANS

Plans were laid by late 1969 to create an international Cryonics Equipment Corporation (CEC) which would purchase,

sell, and maintain the necessary equipment for permanent cryonics storage. The shareholders would be the members of the various European cryonics societies. As a "proof of sincerity" each member of each society was required to make arrangements for cryopreservation.

1970-1984

For the next few years, in the early '70s, there was a flurry of activity among the existing groups on the European continent; England also got in the act and started a "cryogenics" (really cryonics) society. Much of this is documented in *The Outlook*, mouthpiece of the Michigan cryonics group headed by Robert Ettinger, and the steadiest source on the ongoing cryonics movement during the difficult decade of the 1970s. (The publication bore the title *Cryonics Society of Michigan Newsletter* for two of its then-monthly issues starting in January 1970, then changed to *The Outlook*. It changed again, to *The Immortalist*, in March 1976, and finally, to *Long Life*, in November 2006, where it continues today.)

In the August 1970 *Outlook* there is a report of progress, excerpted below, on a European Cryonics Corporation, a later incarnation, it appears, of the CEC noted above.¹⁷

EUROPEAN CRYONICS CORPORATION

The cryonics movement in Europe has shown increasing activity of late. The most important news concerns the formation of the European Cryonics Corporation (E.C.C.), which is being organized to provide a storage facility of international scope.

The activities of the corporation will at first be of limited nature. Initial working capital is planned of 80,000 Swiss Francs (about \$20,000) to be provided by the sale of 400 shares of stock to be valued at 200 Swiss Francs each.

Only officers and members of boards of directors of Cryonics Societies are eligible for membership in the ECC. Shares are to be allotted by country and by

population. The amount of shares purchasable by an individual will be limited to 40. [...] Shares will cost about 200 FS (about \$50) each.

The original capital is intended to finance a small cryatorium with but one capsule capable of holding two people. It is estimated the costs will be as follows: [about \$20,000, including ground, building, capsule and reserves].

Cryatorium

The proposed site of the cryatorium is located between the towns of Rodez and Decazeville in the Aveyon Department in the south of France. Apparently the ground has not previously been built upon. It will be designated as a cemetery and will not be owned outright by ECC but will be granted as a concession in perpetuity.

Detailed plans for the cryatorium have been prepared by M. Jean Michael Huet, architect and SCF Director of Works. The building is designed to eventually hold twenty two-person capsules and will be built underground at a depth of approximately four feet in order to use the earth as an insulating system. A drainage well and forced ventilation are added features. Space will be provided as well for a machine to produce the needed liquid nitrogen in the future.

It is estimated that such a machine, suitable to such an installation, would cost about 200,000 SF. It would require 36KW of electricity and approximately 90 cubic feet of water per hour and would produce 58,400 litres of liquid nitrogen per year. This would yield the nitrogen at a cost of approximately 15¢ per litre which is much

more expensive than that available from commercial sources (at the distribution point) as reported by Joseph Cannon in Wisconsin (6¢ per litre).

There are additional cost estimates, suggesting the operation would be more expensive than a comparable facility in the U.S. though still presumably within the expected budget. Overall however the project was never completed and no cryonics patients were stored by the ECC, which had a shadowy existence at best.

Some highlights of individuals or their groups are also worth noting. All quotes until noted otherwise are from the respective issue of the *Outlook*.

In March 1971 difficulties with French laws regarding cryonics are noted.¹⁸

FRENCH LEGAL PROBLEMS

Apparently the laws involving interment in France were so narrowly drawn that cryonic suspension is illegal in that country.

Accordingly, it has become necessary that the Societe Cryonics de France launch a program to bring about the adjustment of certain parts of the civil code of the nation so that they will accommodate cryonic suspension.

Working on the proposal were Anatole Dolinoff, dynamic president of the society, Jacques Wartell, Judicial Director of the society and a magistrate, whose name was omitted in the lengthy report that appeared in the December 1970 issue of the *Bulletin de la Society Cryonics de France*. [Note: these Bulletins were massive works, much more detailed and in some respects much better than anything then produced in the U.S.]

The proposed changes will involve a number of articles in the Civil Code [article numbers are given]. It is largely a matter of slight changes in wording or additions of phrases

that convey the concept of cryonic suspension.

Needless to say, we in the United States are lending our good wishes in the success of this great endeavor.

(Sad to say, cryonics is still illegal in France.¹⁹)

In August there is a report of Dolinoff's visit to Russia, followed by an article about progress on the new cryotorium:²⁰

DOLINOFF BACK FROM RUSSIA

Anatole Dolinoff, President of the Societe Cryonics de France, has called us from Paris and followed with a letter, reporting on his visit to the laboratory of Prof. Vladimir Negovski in Russia.

Dr. Negovski is one of the leading experts on resuscitation in Russia and in the world. M. Dolinoff is descended from a famous Russian biologist, Pachoutine, a member of the Russian Academy of Medicine, who discovered certain vitamins and studied the metabolism of glucose.

Prof. Negovski was not only very cordial personally, but was friendly to cryonics, expressing the opinions that it may work and should be encouraged. (On the pessimistic side, however, he believes the human brain more delicate than that of the cat, and present freezing methods are not fully adequate; of course, no one has claimed they are, and we still have to rely on the repair of some freezing damage.) Dr. Negovski authorized the French society to reprint his articles, "Terminal States" and "Reanimation of the Body." Even more remarkable, he has agreed to come to Paris for the formalization of the European Cryonics Corporation! M. Dolinoff is a splendid ambassador indeed.

Finally, we learn that Dr. H. Lecompte is to reprint one

of M. Dolinoff's cryonics articles in the Acta Gerontologica et Geriatrica Belgica, and that M. Dolinoff is currently touring Tunisia. In September he is to meet with Art Quaife of BACS [Bay Area Cryonics Society, Northern California] in Paris.

FRENCH PRESS FEATURES NEW CRYOTORIUM

In late June and early July three Parisian newspapers reported the decision of the mayor and city council of the village of Beauvoir sur-Mer to sell to SCF 1100 square meters of land (equivalent to a lot of about 100 ft by 100 ft.) for 1 franc, for the purpose of erecting a cryotorium. The only stipulation is that the building must be completed within five years. The transaction has been completed.

Le Figaro, leading morning paper, had the lengthiest article. Beauvoir is described as a small village, "all white, all clean, on the edge of a road shaded by tamarisks tossed by the wind and sea." The reclaimed land was at one time an oyster bed and duck marsh. The mayor frankly admitted that he thought a cryotorium would be an asset to the village in attracting tourists. Beauvoir is located near l'Ile de Noimoutier, which is on the Atlantic coast just south and east of Nantes in the department of Vendee, approximately 150 miles from Paris.

In all three papers the attitudes expressed were, though slightly skeptical, for the most part favorable. In fact, there was a tendency towards exaggerating the

popularity and existing accomplishments of the movement.

One negative aspect noted was the expense of cryonic suspension quoted at from 150,000 to 170,000 francs (approximately \$40,000), which is considerably increased from the amount quoted by SCF in 1970 (80,000F).

Not mentioned in the news stories but communicated by M. Dolinoff by letter is the intention of SCF to acquire its own nitrogen generator, which should decrease the



The meeting in Russia. From left: Elisabeth Brisbart, fiancée of Anatole Dolinoff; Vladimir Negovsky; Anatole Dolinoff.²¹

cost to some extent.

In 1972 there were several short notices about a newly-formed Spanish cryonics society. This is excerpted from the July issue.²²

SPANISH SOCIETY GAINS MORE NOTICE

The Cryonics Society of Spain (La Asociacion cryonics de Espana) has been given its latest write-up in Karma 7, a magazine devoted to the "New Horizons of Science." Although the magazine provides some questionable company including astrology, the article seems, at least to one with little Spanish, to be fairly straightforward. It contains short interviews with, and photographs of, several Society members:

President Jorge Blaschke,

astronomer and writer; Vice President Salvador Torroella, a naturalist; Secretary-General Ernesto Olivan; Research Director Dr. Buenaventura Deusedes, psychologist and criminologist; Legal Director Francisco Saez, attorney. [Photographs shown.]

The vigor of the Spanish group is admirable, especially in view of the conservative character of



Jorge Blaschke, Cryonics Society of Spain, 1972²³

Spanish society.

Greater coverage was given in the 1972 newsletters to cryonics in England under the newly formed British Cryogenic Society. There was a lengthy writeup in the March issue, followed by a travelogue report in the September issue by editor Mae Junod (later Mrs. Ettinger) who made a trip to England. Her interesting report is excerpted here.²⁴

TRAVELOGUE - LONDON - BCS

[...] London has restored its buildings to a large extent rather than destroy them and replace them with modernity. Consequently walking about in the city is a joy. Most especially the Georgian architecture is charming

with a grace and simplicity which I have seen no place in America other than New Orleans.

I wrote to Brian Blair-Giles, of BCS (The British Cryogenic Society) before I left the U.S. and was contacted when I arrived in London by Geoffrey Pearl, Chairman of that organization. He does not live in London but spends every evening there at a social club in [or very near] Soho. [...] It is close to the theater district and Old Compton Road, where are located Wheeler's and Le Bistingo, which no one should miss when in London. The food and company are of the best--and the wine!!! [...]

Geoffrey and I had a lengthy conversation about the cryonics movement in England. It seems to have come up against the stone wall of indifference and adherence to old traditions and even hostility that the movement has encountered and is only slowly overcoming in the U.S.

However, Geoffrey has many plans to overcome these obstacles. He feels that research to perfect methods of cryonization and resuscitation is of primary importance. There are plans afoot to make a start in this direction, and a building is available upon completion of the plans.

Also a comprehensive public relations program is being developed.

There have been complaints from The British Cryogenic Council in regard to the use of the term Cryogenic in the name of the society in England. Apparently it has developed into a legal matter and is being dealt with. The probability is that the term Cryonic will be substituted. My opinion is that this is for the best as it will lend cohesiveness to the international aspect of the movement. [...]

I also met and had an even longer visit with Jean Francois Le Cot [...]. In fact I spent an evening at his home, where I met a number of handsome and interesting people, most of whom were French.

Jean Francois is intensely interested in the research aspect of cryonics and wishes to become a cryobiologist. However, he says the opportunity to achieve his aim is practically nonexistent in Europe. He feels he may decide to study in the U.S. if he can work out an arrangement at some university whereby he can teach as well as study. He is at present a teacher of French in England. I soon found out, from talking to Jean Francois's friends, that the philosophical aspects of the cryonics concept are exceedingly important. This was evident in my discussion with Geoffrey as well. It is difficult for a culture steeped in ancient and valued traditional ways of thought to accept something so radical as cryonics. There are many attendant areas of disbelief and objection that are going to have to be overcome. Granted a victory over the problem

of successful resuscitation would obviate much of the philosophical resistance, nevertheless, much of it is not going to yield to even guaranteed immortality. For instance, much of religious belief is inherently nihilistic, holding that the life of the body is inferior to that of the "soul." Also, life is difficult for many people. It is not easy for them to believe that it will be any better in the future than it is now, or for that matter, that it might not be worse.

I think the discussions I had with Geoffrey and Jean Francois and his friends were of value in several ways; they gave us all a feeling of being involved together in a movement, a feeling that cannot be brought about by mere printed words. Also I have a clearer picture of the difficulties that are confronting the people in England and it is possible we may be able to help them to overcome them. It must have been heartening for them to know that we have faced the same difficulties here and are making at least some progress in overcoming



Brian Blair-Giles²⁵

them.

The above reports suggest a vigorous cryonics community was growing up in Europe, accompanied, we might expect, by a similar successful movement in the Western hemisphere. Unfortunately,

the reality of the situation is that things were deteriorating and the remainder of the seventies would not be a good time for the fledgling movement, even in its American homeland, let alone elsewhere. Most of the early cryonics patients would be lost and only a handful of new cases would be added to the ranks by the mid-eighties.²⁶ Cryonics organizations needed to be restructured along more financially solid lines. And it would be done—in the U.S. Meanwhile in Europe cryonics activity would die down after 1972 and reach a state of near-dormancy. No ECC or other continent-wide organization would be set up. There would be no cryatorium. No one in Europe would be cryopreserved and stored there during this period, nor for the rest of the century, with one strange exception.

THE MARTINOT CASE: 1984

We met the Martinots above: Raymond the assistant physician, and his wife, Monique, the math teacher. Both were involved in forming the first French cryonics organization, back in 1966. Their organization soon split, Raymond heading one part, Dolinoff the other, though the two men were apparently still on good terms. But after fifteen years, suddenly a crisis developed, an all-too-familiar one connected with the fragility of human life.... The story is well enough told from a contemporary source, *The Immortalist* (formerly *The Outlook*) of August 1984, reprinted below.²⁷ (By this time the Michigan group had formed the Cryonics Institute, a major cryonics organization which continues today.)

SUSPENSION FUROR IN FRANCE

On July 27 the French news media erupted with the story of a freezing in that country, last February, which had just come to light. The largest newspapers carried prominent stories--a large photo and story on the front page of *France Soir*, for example--and TV, radio, and print coverage have continued apace. We have been able to piece together the following information, but of course cannot guarantee the accuracy of all the details.

(Dr.?) Raymond Martinot (at

first spelled "Martineau" in the press), 62, is a retired Assistant (Professor?) of the Academy of Medicine in Paris. His wife, Monique Leroy, died at 49 of bleeding related to an iliac tumor. She was perfused in the hospital with dextran/heparin at the request of her husband, who then, at home, put her in a refrigerator which had been purchased at an earlier time, when it appeared he himself might be fatally ill. The refrigerator apparently functions in the range of -60 to -95 degrees Centigrade--roughly as cold as dry ice.

The story broke when it did because a power failure made Dr. Martinot buy dry ice, and some unfriendly busybody told the police. The local population are mainly sympathetic, we gather, although the parish priest "does not know on which leg to dance", but there has been official harassment, including an effort by the Ministry of Environment to prove the refrigerator is a threat to the ecology. However, permission to keep the frozen patient at home had been obtained from the town mayor, and it now seems the hostile forces in officialdom have run out of ammunition, at least for the time being.

Press commentary at first ranged from bad to extremely bad, with the all-too-familiar refrains: (1) Trying to cheat death is unnatural, antireligious, and not very sporting; (2) You-can-freeze-isolated-cells-but-a-whole-large-dead-organism-leaves-no-hope-whatever.

However, Dr. Martinot has received warm support from Anatole Dolinoff, President of the Societe Cryonics

de France, with which Dr. Martinot--although not a member--has long been associated. Dr. Dolinoff has been able to arrange several exposures in the various media, at least once in the company of Dr. Martinot, and in addition to the technical questions has emphasized these points:

(1) Cryonicists seek indefinitely extended life, but do not expect infinite life, since destruction from some catastrophe will occur sooner or later, so for the religious their faith does not lose relevance. (2) The French society (like some of those in the States) is strictly nonprofit, Anatole himself working for zero francs, so those looking for get-rich-quick schemes can forget it. The reports we have seen indicate that Mr. Dolinoff's vigorous and intelligent efforts have made France a little bit friendlier to cryonics.

Dr. Martinot's decision to go it alone, in the way he did, does not seem the wisest, of course, but at least he did something, putting love and honor ahead of convenience and public opinion, and for that he has our respect and admiration. We have written to express these feelings, and to ask whether he has any new plans. If he has any requests or proposals for the Cryonics Institute, we will do our best to help him.



Raymond and Monique when they were young.²⁸

Some further details: Dr. Martinot (he really was "Doctor" as other accounts attest) had purchased a chateau in the 1970s near Saumur in the Loire Valley, France, along with a freezer to hold his frozen remains should the need arise—as in fact it did for his wife.²⁹ Authorities challenged the non-burial non-cremation, but were warded off and Martinot charged admission to tour groups to pay the freezer's power bill (see below). He lived on for many years after this incident and there was much concern over what would happen when he himself arrested. Dolinoff may have been initially supportive but later seems to have become hostile. I was in touch with Dolinoff starting late in 1996; his main response is included in the CryoNet posting reprinted below.³⁰

[from Mike Perry, 30 Jan. 1997:] Recently there was some discussion of a freezing in France that took place some years ago (for example Anatole Dolinoff, #7353, Dec. 24). A woman, Monique Martinot, was frozen by her husband Dr. Raymond Martinot after she died 25 Feb. 1984. Since then she has been maintained at -55 C in a freezer, but might be thawed out when her husband dies. I've had some correspondence with Dolinoff, which is reprinted below edited by me for English. I thank Mr. Dolinoff for reviewing the present posting in its entirety and for giving permission to post it to CryoNet.

[Anatole Dolinoff to Mike Perry, Dec. 27, 1996:]

Hi Mike !

There is nothing confidential in the following.

Dr Raymond Martinot intends to be frozen and hopes that his son will do that in France. He hopes also that the same son will continue to store his wife Monique at -55 C or so. As I see it, this is an infeasible dream.

I don't support the cold storage of Monique because

she began by remaining at room temperature 7 hours. This was because of a technical problem with refrigeration in the clinic where she died. Since then, she has been stored at -55 C (that is, since 1984). Under these conditions, to pretend as Martinot does that the chances of a future return to life of his wife are 15% is, in my estimation, a madman's fantasy.

In return, Dr Martinot has refused to put me in touch with another man desiring to put his deceased mother into cold storage. As a result, the said mother remained a month and a half at a few degrees below zero centigrade. After that, as soon as this man got my address thanks to an American organization, this woman was put into dry ice (stored in a cemetery), and contract negotiations were started--but these dragged on for some time. Finally, after a year and a half on dry ice, the woman was sent to Cryonics Institute and, being found in acceptable condition, was placed into liquid nitrogen storage.

Thus, I have no contacts with Dr Martinot. I know only that the Authorities have told him that if they permit his wife to remain at -55 C in the basement of his chateau, this authorization will cease when he dies.

As I see it, Dr Martinot doesn't have and never will have the money to allow his wife and/or himself to be sent to the States for cold storage. Also, his son will not have the right to continue the cold storage of his parents.

But if it is your wish to get in touch with him, I give you the address of Dr Martinot from ten years ago: 15, Avenue Victor Hugo

RUEIL-MALMAISON 92500 FRANCE
Sincerely : Anatole
DOLINOFF

[MP again:] In a later message Mr. Dolinoff also added that, according to what he heard several times, he thinks it is likely that Dr. Martinot would *not* send his wife to the States nor permit himself to be sent (after his freezing, if it happens). The way he has carried out the freezing it has been very inexpensive for him--because he charges admission to tour groups who come to visit the basement of his chateau where his wife is stored!

It looks then as if it could be difficult to arrange for more secure storage for this case, given the mindset of the people involved. I very recently wrote to Dr. Martinot at the above address, and am waiting for a reply. (Has anyone had any success contacting him?) Another point worth making, I think, is that, without further information to go on, I would favor continuing the freezing (contrary to Mr. Dolinoff's opinion) in spite of the 7 hours of warm ischemia and other problems (not excepting that -55 C is not very cold for longterm storage, and there is the additional problem of whether any warming from *this* temperature has occurred in the more than ten years since the freezing). An x-ray or CT scan would reveal something about the condition of the brain. To save on cost the sensible thing would be to convert Ms. Martinot to neuro, which might then permit the authorities to commit the rest of the body to burial and satisfy their requirements--but it remains to be seen if neuro would

be acceptable to the people involved.

I asked Mr. Dolinoff about the possibility of freezing brains in France and sending the brain out of the country (minus the body of course). The main problem with this, according to him, is that brain death criteria would be applied, i.e. the brain could not be removed until brainwave activity had ceased (for a "sufficient" time--three hours by clinical standards in France)--very bad for cryonics.

Anatole Dolinoff died in 1999 of ALS, and was not cryopreserved. He thought the chances of cryonics working were slim and didn't want to deprive his widow of money. Robert Ettinger, who posted this information at CryoNet, commented further: "A very depressing case. He was a delightful fellow, with diverse interests, and kind-hearted, adopting several stray dogs. He visited me and Mae a few years back. He also helped in the suspension of a French person years ago, building a transport container. I miss him."³¹

As for Dr. Martinot, I never received a reply from him, and no one contacted me who had heard from him. He died of a stroke in 2002, and his son Remy had him placed in the freezer with Monique. Authorities contested again, and Remy held them at bay for four years. Then there was a freezer malfunction that caused warmup of the patients to an estimated -20°C for several days. Remy thought this ended the chances of revival (mistakenly, I think many knowledgeable cryonicists would agree, if conditions were otherwise favorable. Consider the Suda experiment where the cat brain was at this temperature for months and still showed recognizable brain waves). The son then had the bodies cremated, a sad, tragic conclusion to this gripping drama.³²

WHAT HAPPENED TO THE REST?

Full information is lacking but it appears that nearly all of the early European activists have died and were not cryopreserved.³³

MORE RECENT HAPPENINGS

To conclude on a little lighter note, here is a very brief summary of some more recent

cryonics-related activity in Europe.

The start of "modern" cryonics in Britain goes back to May 1986 when the British Cryonics Society was formed; within two months its name had been changed to Mizar (the companion star to Alcor in the Big Dipper);³⁴ in 1989 it became Alcor UK.³⁵ The main purpose of the organization was to provide emergency transport and other cryonics services, up to but not including long-term patient storage. In October 1990 Alcor UK hosted a "first European cryonics conference" at the Gatwick Airport, London. About 50 attended from Great Britain, France, Germany, Austria, Portugal, Italy, Japan, Canada, and the United States.³⁶ Eventually Cryonics UK, another organization with a broader theater, would become active in assisting cryonics cases in Britain and neighboring countries. Much credit is due to Alan Sinclair for his hard work and financial sacrifices in shaping and assisting the British cryonics organizations throughout their history.³⁷



Alan Sinclair about 1990³⁸

After the 1990 conference a long interval passed without much in the way of similar European events. In 2010 the German Society for Applied Biostasis (DGAB) held a symposium "to create a milieu for scientific discussion of cryonics-related issues as well as to elevate the scientific status of cryonics and bring more scientists into the field." A second, similar symposium was hosted by the DGAB in 2014.³⁹

Today there are, in fact, a good number of cryonics groups in Europe. A "Cryonics Europe" website lists and gives links to groups in fourteen countries: Belgium, Denmark, Finland, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Russia, Spain, Sweden, UK.⁴⁰

Interestingly, France is not included, though I know of French people who are interested, one of them Roland Missonnier, who is still involved after half a century.⁴¹

But in Russia there is now something special. KrioRus is a full-service cryonics organization based on the outskirts of Moscow, the first of its kind outside the U.S. Started in 2005, as of April 2016 it had 51 human patients and 20 or so pets. It offers a full range of preservation options: brain only, head only, and whole body.⁴²

As a parting shot I note the upcoming cryonics conference in Basel, Switzerland, planned for Nov. 12-13.⁴⁴ Are you going? ■



Staff working at the KrioRus facility located at Sergeyiv Posad on the outskirts of Moscow.⁴³

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Note concerning quoted material. For lengthier, quoted
 passages in courier font minor spelling, typographical
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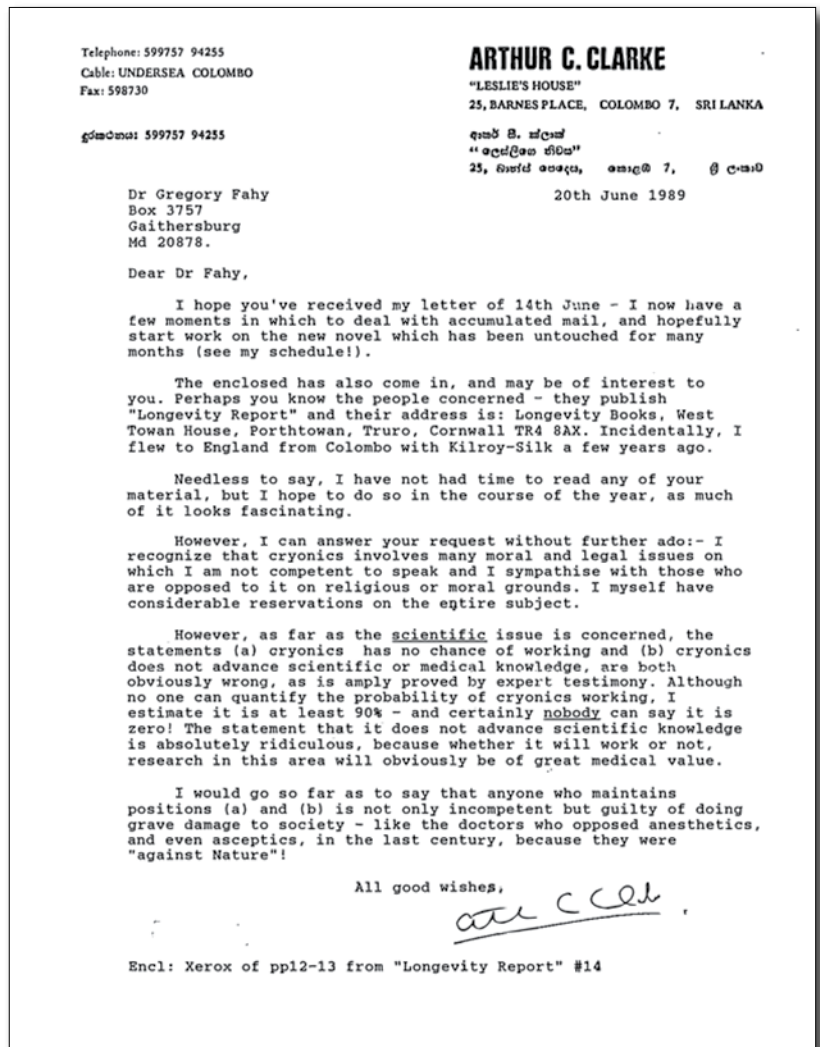
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Acknowledgments. *I thank York Porter of the Immortalist Society for permission to use text and photographs from back issues of the (now) IS newsletter (Outlook, Immortalist). I thank Roland Missonnier for help with some of the early French material, including images. I thank Danila Medvedev for permission to use the KrioRus photo. I thank Max More for clarifications regarding cryonics in the UK since the mid-1980s. Any use of copyrighted material outside of permission is consistent with what I believe to be “fair use” policy for nonprofit, educational purposes—RMP.*

IMPORTANT HISTORICAL DOCUMENT BROUGHT TO LIGHT

At Alcor's website, <http://www.alcor.org/Library/html/declarations.html>, is a section, "Scientist Declarations." These supportive communications were provided to Alcor in 1988 and 1989 in connection with legal proceedings involving various state and local officials in Alcor's then location of Riverside, California. Cryonics was a controversial practice, and its propriety was being challenged on various grounds, including (though not limited to) whether it was scientifically defensible. In one such case, "Roe v Mitchell," an Alcor member, Dick Jones (anonymized in the proceedings as John Roe), sued for the right to be cryopreserved. This rather draconian response followed a declaration of David Mitchell, Chief of the Office of the State Registrar, Department of Vital Statistics, that "Existing California statutes provide no basis to authorize cryonic facilities to store human remains. Therefore, if the Alcor Foundation has any bodies or body parts stored in the facility, the foundation is guilty of a misdemeanor ... and should be reported to the local district attorney for investigation and prosecution as appropriate." (In the end Alcor won the right to practice cryonics in California, which had important repercussions for cryonics organizations in general both in and outside the state.)¹

In one of the declarations connected with the Mitchell case the famous science fiction and science author Arthur C. Clarke made a much-heralded endorsement: "Although no one can quantify the probability of cryonics working, I estimate it is at least 90% – and certainly nobody can say it is zero! The statement that it does not advance scientific knowledge is absolutely ridiculous, because whether it will work or not, research in this area will obviously be of great medical value." (Clarke was not personally attracted to cryonics, though, and died in 2008 without being cryopreserved. I should also note that cryonics today uses vitrification with significantly less damage to tissues than the procedures Clarke had in mind.)² The above quote from Clarke and a bit more, actually part of a letter from him, will be found at the website. Due to sensitivities of the time and later, the rest of the document was not made public. Greg Fahy, the recipient of the letter, has now okayed its full publication, so here it is—read and enjoy! ■



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All sources accessed 12 Sep. 2016—Mike Perry.



REDUCE YOUR ALCOR DUES WITH THE CMS WAIVER

Alcor members pay general dues to cover Alcor's operating expenses and also make annual contributions to the Comprehensive Member Standby fund pool to cover the costs of readiness and standby. Benefits of Comprehensive Member Standby include no out-of-pocket expense for standby services at the time of need, and up to \$10,000 for relocation assistance to the Scottsdale, Arizona area.

Instead of paying \$180 per year in CMS dues, Alcor also provides members the option to cover all CMS-associated costs through life insurance or pre-payment. Members who provide an additional \$20,000 in minimum funding will no longer have to pay the \$180 CMS (Comprehensive Member Standby fund) fee. This increase in minimums is permanent (for example, if in the future Alcor were to raise the cost of a neurocryopreservation to \$90,000, the new minimum for

neurocryopreservation members under this election would be \$110,000). Once this election is made, the member cannot change back to the original minimums in the future.

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Become An Alcor Associate Member!

Supporters of Alcor who are not yet ready to make cryopreservation arrangements can become an Associate Member for \$5/month (or \$15/quarter or \$60 annually). Associate Members are members of the Alcor Life Extension Foundation who have not made cryonics arrangements but financially support the organization. Associate Members will receive:

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

To become an Associate Member send a check or money order (\$5/month or \$15/quarter or \$60 annually) to Alcor Life Extension Foundation, 7895 E. Acoma Dr., Suite 110, Scottsdale, Arizona 85260, or call Marji Klima at (480) 905-1906 ext. 101 with your credit card information.

Or you can pay online via PayPal using the following link: <http://www.alcor.org/BecomeMember/associate.html> (quarterly option is not available this way).

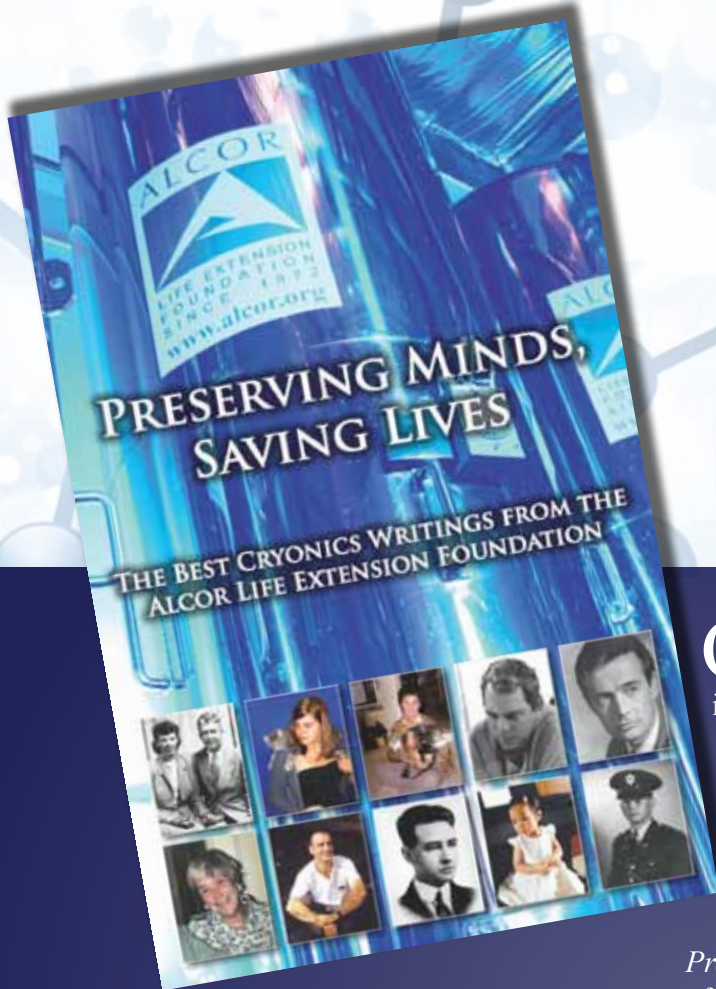
Associate Members can improve their chances of being cryopreserved in an emergency if they complete and provide us with a Declaration of Intent to be Cryopreserved (<http://www.alcor.org/Library/html/declarationofintent.html>). Financial provisions would still have to be made by you or someone acting for you, but the combination of Associate Membership and Declaration of Intent meets the informed consent requirement and makes it much more likely that we could move ahead in a critical situation.



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THE BEST CRYONICS WRITINGS OF THE ALCOR LIFE EXTENSION FOUNDATION



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– Max More, Ph.D.
President and CEO of Alcor

Cryonics is an experimental medical procedure that uses ultra-low temperatures to put critically ill people into a state of metabolic arrest to give them access to medical advances of the future. Since its inception in the early 1960s, the practice of cryonics has moved from a theoretical concept to an evidence-based practice that uses emergency medical procedures and modern vitrification technologies to eliminate ice formation.

Preserving Minds, Saving Lives offers an ambitious collection of articles about cryonics and the Alcor Life Extension

Foundation. From its humble beginnings in 1972, and its first human cryonics patient in 1976, Alcor has grown to a professional organization with more than 1,000 members, more than 140 human patients, and more than 50 pets, all awaiting a chance to be restored to good health and continue their lives.

This book presents some of the best cryonics writings from *Cryonics* magazine from 1981 to 2012. There are clear expositions of the rationale behind cryonics, its scientific validation, and the evolution of Alcor procedures. Also covered are repair and resuscitation scenarios, philosophical issues associated with cryonics, and debates within the cryonics community itself.

Soft Cover Edition: \$20 – Hard Cover Edition: \$35

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or call 1-877-GO ALCOR (462-5267)

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"Society's failure to take cryonics seriously is a tragedy that is probably costing countless lives. Alcor, notably via its magazine, is leading the fight to change that."

– Aubrey de Grey, Ph.D.

Biomedical Gerontologist and Chief Science Officer
of the SENS Research Foundation

"Alcor appears to be the leading organization in the application of cryonics in medicine.

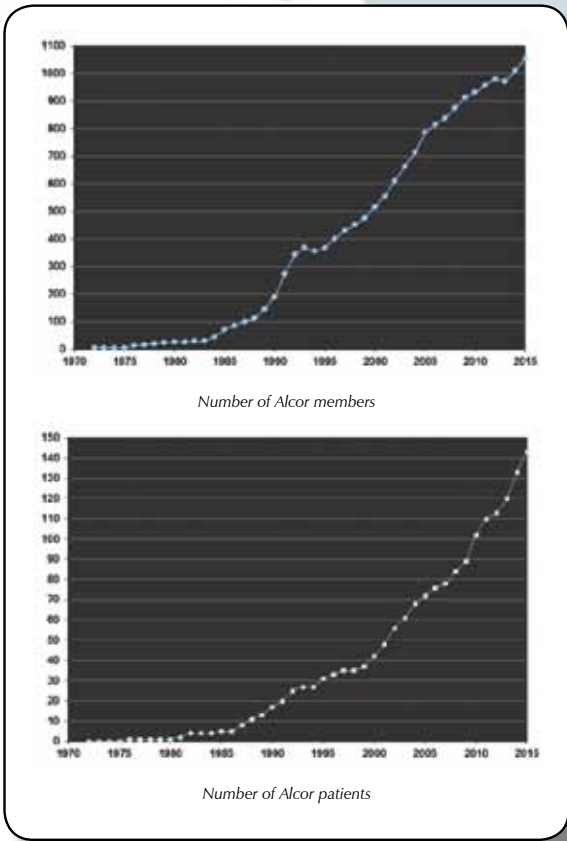
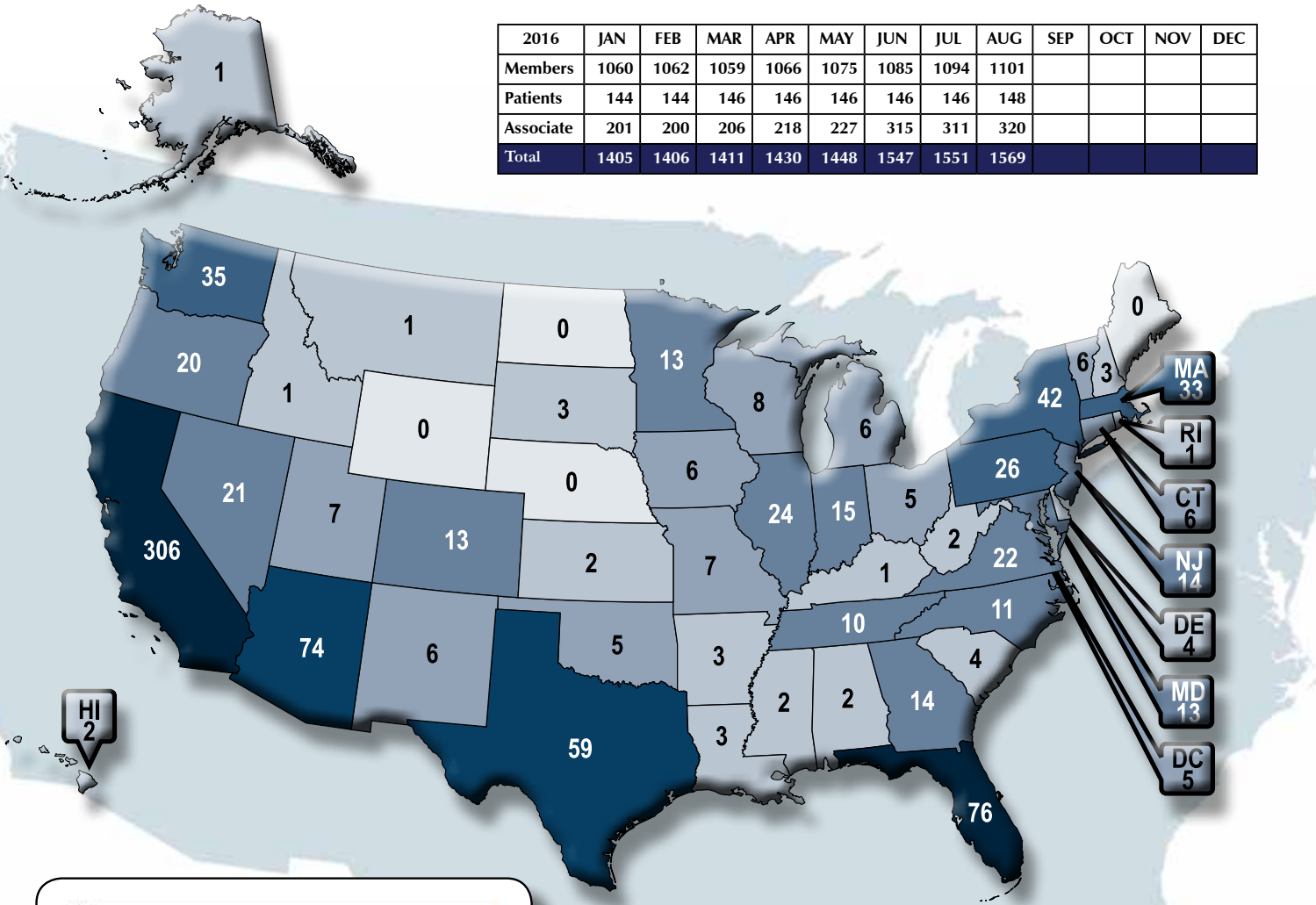
I'm proud to be a part of this effort."

– Michael D. West, Ph.D.

Stem Cell Scientist and Chief Executive
Officer of BioTime, Inc.

Membership Statistics

2016	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Members	1060	1062	1059	1066	1075	1085	1094	1101				
Patients	144	144	146	146	146	146	146	148				
Associate	201	200	206	218	227	315	311	320				
Total	1405	1406	1411	1430	1448	1547	1551	1569				



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

International

Country	Members	Patients
Australia	13	3
Canada	50	2
Chile	1	0
China	0	1
Germany	10	0
Hong Kong	2	0
Israel	1	1
Italy	3	0
Japan	4	0
Luxembourg	1	0
Mexico	4	0
Monaco	1	0
Netherlands	1	0
New Zealand	1	0
Norway	1	0
Portugal	4	0
Singapore	1	0
Spain	3	1
Thailand	4	1
United Arab Emirates	1	0
United Kingdom	31	3
TOTAL	137	12

Putting a Computer in Your Brain Is No Longer Science Fiction

Like many in Silicon Valley, technology entrepreneur Bryan Johnson sees a future in which intelligent machines can do things like drive cars on their own and anticipate our needs before we ask. What's uncommon is how Johnson wants to respond: find a way to supercharge the human brain so that we can keep up with the machines. From an unassuming office in Venice Beach, his science-fiction-meets-science start-up, Kernel, is building a tiny chip that can be implanted in the brain to help people suffering from neurological damage caused by strokes, Alzheimer's or concussions. Top neuroscientists who are building the chip — they call it a neuroprosthetic — hope that in the longer term, it will be able to boost intelligence, memory and other cognitive tasks. The medical device is years in the making, Johnson acknowledges, but he can afford the time. He sold his payments company, Braintree, to PayPal for \$800 million in 2013. A former Mormon raised in Utah, the 38-year-old speaks about the project with missionary-like intensity and focus.

Elizabeth Dwoskin /
The Washington Post
15 Aug. 2016

<https://www.washingtonpost.com/news/the-switch/wp/2016/08/15/putting-a-computer-in-your-brain-is-no-longer-science-fiction/>

Brain Mapped at Single-Neuron Resolution

Neuroscientists today publish in *Neuron* details of a revolutionary new way of mapping the brain at the resolution of individual neurons, which they have successfully demonstrated in the mouse brain. The new method, called MAPseq (Multiplexed Analysis of Projections

by Sequencing), makes it possible in a single experiment to trace the long-range projections of large numbers of individual neurons from a specific region or regions to wherever they lead in the brain—in experiments that are many times less expensive, labor-intensive and time-consuming than current mapping technologies allow. Although a number of important brain-mapping projects are now under way, all of these efforts to obtain “connectomes,” or wiring maps, rely upon microscopes and related optical equipment to trace the myriad thread-like projections that link neurons to other neurons, near and far. For the first time ever, MAPseq “converts the task of brain mapping into one of RNA sequencing,” says its inventor, Anthony Zador, M.D., Ph.D., professor at Cold Spring Harbor Laboratory.

Peter Tarr / Cold Spring
Harbor Laboratory
19 Aug. 2016

<http://www.cshl.edu/news-and-features/revolutionary-method-to-map-the-brain-at-single-neuron-resolution-is-successfully-demonstrated.html>

Chinese Scientists Discover Molecules to Repair Organs

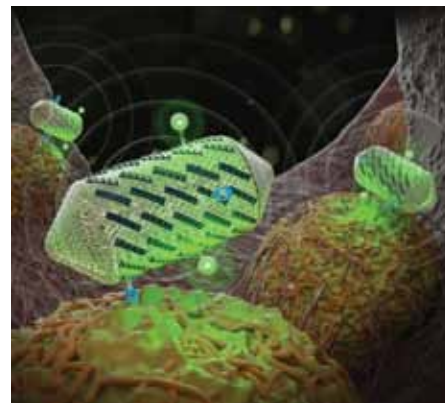
Chinese scientists have discovered a small molecule that can regenerate tissue, which in the future could make tissue regeneration much easier for many. The research was led by professor Zhou Dawang and Deng Xianming of the School of Life Sciences, Xiamen University, and professor Yun Caihong of Peking University. The findings were published in the latest edition of *Science Translational Medicine*, on August 17. Zhou said they have discovered a drug, XMU-MP-1, which can promote repair and regeneration in the liver, intestines and skin. In the future, the pills may do away with the need for organ transplants or complex biomaterial and cell therapies, he said. Zhou and his colleagues specifically targeted a critical signaling molecule in

the Hippo pathway, which controls organ size. XMU-MP-1 has proven to inhibit the activity of MST1/2, the central component of this pathway and promote cell growth in four different mouse models of acute and chronic injuries, including acetaminophen-induced injury, which is a common cause of liver failure worldwide. Zhou said they have applied for a patent . . .

Xinhua News Agency
20 Aug. 2016

http://news.xinhuanet.com/english/2016-08/20/c_135618154.htm

Designing Ultrasound Tools with Lego-Like Proteins



Protein-shelled structures called gas vesicles, illustrated here, can be engineered with Lego-like proteins to improve ultrasound methods. The gas vesicles can help detect specific cell types and create multicolor images. Credit: Barth van Rossum for Caltech

Ultrasound imaging is used around the world to help visualize developing babies and diagnose disease. Sound waves bounce off the tissues, revealing their different densities and shapes. The next step in ultrasound technology is to image not just anatomy, but specific cells and molecules deeper in the body, such as those associated with tumors or bacteria in our gut. A new study from Caltech outlines how protein engineering techniques might help achieve this milestone. The researchers

engineered protein-shelled nanostructures called gas vesicles—which reflect sound waves—to exhibit new properties useful for ultrasound technologies. In the future, these gas vesicles could be administered to a patient to visualize tissues of interest. The modified gas vesicles were shown to: give off more distinct signals, making them easier to image; target specific cell types; and help create color ultrasound images. “It’s somewhat like engineering with molecular Legos,” says assistant professor of chemical engineering and Heritage Principal Investigator Mikhail Shapiro ...

Whitney Clavin /

California Institute of Technology

24 Aug. 2016

<https://www.caltech.edu/news/designing-ultrasound-tools-lego-proteins-51834>

Science Set to Upstage Fiction with Fantastic Voyage

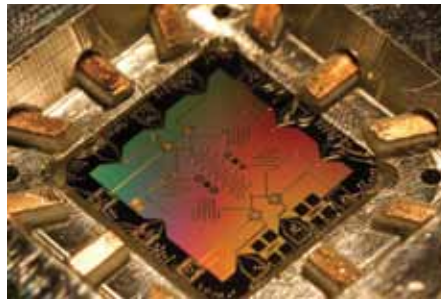
Fifty years to the day after the film *Fantastic Voyage* was first shown in theatres, the Polytechnique Montreal Nanorobotics Laboratory is unveiling a unique medical interventional infrastructure devoted to the fight against cancer. The outcome of 15 years of research conducted by Professor Sylvain Martel and his team, it enables microscopic nanorobotic agents to be guided through the vascular systems of living bodies, delivering drugs to targeted areas. An action-packed 100,000-kilometre journey in the human body, *Fantastic Voyage* recounted the adventure of a team of researchers shrunk to microscopic size who, aboard a miniature submarine, travelled into a patient’s body to conduct a medical operation in a surgically inoperable area. This science fiction classic has now been eclipsed by procedures and protocols developed by Professor Martel’s multidisciplinary team comprising engineers, scientists and experts from several medical specialties working together on these projects that herald the future of medicine.

Space Daily

26 Aug. 2016

http://www.spacedaily.com/reports/Science_set_to_upstage_fiction_with_Fantastic_Voyage_999.html

Google’s Plan for Quantum Computer Supremacy



Superconducting qubits are tops
UCSB

Last month, Google engineers quietly published a paper (arxiv.org/abs/1608.00263) detailing their plans for “quantum supremacy”: to build the first quantum computer capable of performing a task no classical computer can. “It’s a blueprint for what they’re planning to do in the next couple of years,” says Scott Aaronson at the University of Texas at Austin, who has discussed the plans with the team. So how will they do it? Quantum computers process data as quantum bits, or qubits. Unlike classical bits, these can store a mixture of both 0 and 1 at the same time, thanks to the principle of quantum superposition. It’s this potential that gives quantum computers the edge at certain problems, like factoring large numbers. But ordinary computers are also pretty good at such tasks. Showing quantum computers are better would require thousands of qubits, which is far beyond our current technical ability. Instead, Google wants to claim the prize with just 50 qubits. That’s still an ambitious goal – publicly, they have only announced a 9-qubit computer – but one within reach.

Jacob Aron / New Scientist

31 Aug. 2016

https://www.newscientist.com/article/mg23130894-000-revealed-googles-plan-for-quantum-computer-supremacy/?utm_source=NSNS

Atomic Scale Pipes Available on Demand and By Design

Materials containing tiny capillaries and cavities are widely used in filtration, separation and many other technologies,

without which our modern lifestyle would be impossible. Those materials are usually found by luck or accident rather than design. It has been impossible to create artificial capillaries with atomic-scale precision. Now a Manchester group led by postdoctoral researcher Radha Boya and Nobel laureate Andre Geim show how to make the impossible possible, as reported in *Nature*. The new technology is elegant, adaptable and strikingly simple. In fact, it is a kind of antipode of the famous material graphene. When making graphene, people often take a piece of graphite and use Scotch tape to extract a single atomic plane of carbon atoms, graphene. The remaining graphite is discarded. In this new research, Manchester scientists similarly extracted a strip of graphene from graphite, but discarded the graphene and focused on what was left: an ultra-thin cavity within the graphite crystal. Such atomic scale cavities can be made from various materials ...

University of Manchester

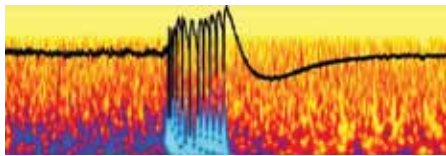
7 Sep. 2016

<http://www.manchester.ac.uk/discover/news/atomic-scale-pipes-available-on-demand-and-by-design/>

Brain Connections Are More Sophisticated Than Thought

Inhibitory synapses act as the brakes in the brain, preventing it from becoming overexcited. Researchers thought they were less sophisticated than their excitatory counterparts because relatively few proteins were known to exist at these structures. But a new study by Duke University scientists, published Sept. 9 in *Science*, overturns that assumption, uncovering 140 proteins that have never been mapped to inhibitory synapses. “It’s like these proteins were locked away in a safe for over 50 years, and we believe that our study has cracked open the safe,” said the study’s senior investigator Scott Soderling, an associate professor of cell biology and neurobiology at Duke. “And there’s a lot of gems.” In particular, 27 of these proteins have already been implicated by genome-wide association studies as having a role in autism, intellectual disability and epilepsy, Soderling said, suggesting that their mechanisms at the synapse could

provide new avenues to the understanding and treatment of these disorders.



This colorful graph shows a peak of abnormal epileptic brain activity in a brain's hippocampus in which an inhibitory protein called *InSyn1* has been depleted.

Duke University / Eurekalert!
8 Sep. 2016

http://www.eurekalert.org/pub_releases/2016-09/du-bca083116.php

Landmark Map Reveals the Genetic Wiring of Cellular Life

Donnelly Centre researchers have created the first map that shows the global genetic interaction network of a cell. It begins to explain how thousands of genes coordinate with one another to orchestrate cellular life. The study was led by U of T Professors Brenda Andrews and Charles Boone, and Professor Chad Myers of the University of Minnesota-Twin Cities. It opens the door to a new way of exploring how genes contribute to disease, with a potential for developing finely-tuned therapies. The findings are published in the journal *Science* on September 23. "We've created a reference guide for how to chart genetic interactions in a cell. We can now

tell what kind of properties to look for in searching for highly connected genes in human genetic networks with the potential to impact genetic diseases," said Dr. Michael Costanzo, a Research Associate in the Boone lab and one of the researchers who spearheaded the study. The study took 15 years to complete and adds to Andrews' rich scientific legacy for which she was awarded a Companion of the Order of Canada.

Jovana Drinjakovic / Donnelly Centre,
University of Toronto
22 Sep. 2016

<http://tdcbr.med.utoronto.ca/news/landmark-map-reveals-genetic-wiring-cellular-life>

A Roadmap to Resuscitation

Successful rejuvenation of cryonics patients will require three distinct technologies: (1) A cure for the disease that put the patient in a critical condition prior to cryopreservation; (2) biological or mechanical cell repair technologies that can reverse any injury associated with the cryopreservation process and long-term care at low temperatures; (3) rejuvenation biotechnologies that restore the patient to good health prior to resuscitation. OR it will require some entirely new approach such as (1) mapping the ultrastructure of cryopreserved brain tissue using nanotechnology, and (2) using this information to deduce the original structure and repairing, replicating or simulating tissue or structure in some viable form so the person "comes back."

The following list is a list of landmark papers and books that reflect ongoing progress towards the resuscitation of cryonics patients:

Jerome B. White, "Viral-Induced Repair of Damaged Neurons with Preservation of Long-Term Information Content," Second Annual Conference of the Cryonics Societies of America, University of Michigan at Ann Arbor, April 11-12, 1969, by J. B. White reprinted in *Cryonics* 35:10 (October 2014), 8-17.

Michael G. Darwin, "The Anabolocyte: A Biological Approach to Repairing Cryoinjury," *Life Extension*

Magazine (July-August 1977):80-83. Reprinted in *Cryonics* 29:4 (4th Quarter 2008),14-17.

Gregory M. Fahy, "A 'Realistic' Scenario for Nanotechnological Repair of the Frozen Human Brain," in Brian Wowk, Michael Darwin, eds., *Cryonics: Reaching for Tomorrow*, Alcor Life Extension Foundation, 1991.

Ralph C. Merkle, "The Molecular Repair of the Brain," *Cryonics* 15(January 1994):16-31 (Part I) & *Cryonics* 15(April 1994):20-32 (Part II).

Ralph C. Merkle, "Cryonics, Cryptography, and Maximum Likelihood Estimation," First Extropy Institute Conference, Sunnyvale CA, 1994.

Aubrey de Grey & Michael Rae, "Ending Aging: The Rejuvenation Breakthroughs That Could Reverse Human Aging in Our Lifetime." St. Martin's Press, 2007.

Robert A. Freitas Jr., "Comprehensive Nanorobotic Control of Human Morbidity and Aging," in Gregory M. Fahy, Michael D. West, L. Stephen Coles, and Steven B. Harris, eds, *The Future of Aging: Pathways to Human Life Extension*, Springer, New York, 2010, pp. 685-805.

Chana Phaendra, "Reconstructive Connectomics," *Cryonics* 34(7) (July 2013): 26-28.

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.

PHOENIX

VALLEY OF THE SUN:

This group meets monthly, usually in the third week of the month. Dates are determined by the activity or event planned. For more information or to RSVP, visit <http://cryonics.meetup.com/45/> or email Lisa Shock at lisa@alcor.org.

AT ALCOR:

Alcor Board of Directors Meetings and Facility Tours—Alcor business meetings are generally held on the second Saturday of every month starting at 11:00 AM MST. Guests are welcome to attend the fully-public board meetings. Facility tours are held every Tuesday at 10:00 AM 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 (650) 772-1251 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

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

OREGON:

The contact person for meetings in the Portland area is Aschwin de Wolf:

aschwin@alcor.org. See also: <https://www.facebook.com/portland.life.extension>.

BRITISH COLUMBIA (CANADA):

CryoBC, a special interest group within the nonprofit Lifespan Society of BC (<http://www.lifespanbc.ca/>) holds meetings for cryonicists in the Vancouver area. To be notified of meetings join the CryoBC mailing list: <https://groups.yahoo.com/neo/groups/cryoabc/info>.

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:

A new group for the Austin area has been started for those interested in discussion and understanding of the relevant technologies and issues for cryopreservation, genomics, epigenetics and medical research for increased life/health span. Contact Tom Miller, 760-803-4107 or tom@blackmagicmissileworks.com.

JAPAN

Cryonics meetings are held monthly in Tokyo. Send queries to grand88@yahoo.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.

UNITED KINGDOM

Alcor members in the UK can contact Garret Smyth at Alcor-UK@alcor.org for information about local meetings.

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

WHAT IS CRYONICS?

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

HOW DO I FIND OUT MORE?

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

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

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

HOW DO I ENROLL?

Signing up for a cryopreservation is easy!

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

Not ready to make full arrangements for cryopreservation? Then **become an Associate Member** for \$5/month (or \$15/quarter or \$60 annually). Associate Members will receive:

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

To become an Associate Member send a check or money order (\$5/month or \$15/quarter or \$60 annually) to Alcor Life Extension Foundation, 7895 E. Acoma Dr., Suite 110, Scottsdale, Arizona 85260, or call Marji Klima at (480) 905-1906 ext. 101 with your credit card information. You can also pay using PayPal (and get the Declaration of Intent to Be Cryopreserved) here: <http://www.alcor.org/BecomeMember/associate.html>



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