ISSN-1079-7832

A Publication of the Immortalist Society

LONG LIFE

Longevity Through Technology

Volume 48 - Number 01

www.immortalistsociety.org www.cryonics.org

www.americancryonics.org

Who will be there for YOU?

Don't wait to make your plans. Your life may depend on it.

Suspended Animation fields teams of specially trained cardio-thoracic surgeons, cardiac perfusionists and other medical professionals with state-of-the-art equipment to provide stabilization care for Cryonics Institute members in the continental U.S.

Cryonics Institute members can contract with Suspended Animation for comprehensive standby, stabilization and transport services using life insurance or other payment options.

SA Suspended Animation

Speak to a nurse today about how to sign up.

Call 1-949-482-2150

or email tabitha@suspendedanimationinc.com

MKMCAD160206 216

CRYONICS INSTITUTE
Technology for Life

Why should You join the Cryonics Institute?

The Cryonics Institute is the world's leading non-profit cryonics organization bringing state of the art cryonic suspensions to the public at the most affordable price. CI was founded by the "father of cryonics," Robert C.W. Ettinger in 1976 as a means to preserve life at liquid nitrogen temperatures. It is hoped that as the future unveils newer and more sophisticated medical nanotechnology, people preserved by CI may be restored to youth and health.

1) Cryonic Preservation

Membership qualifies you to arrange and fund a vitrification (anti-crystallization) perfusion and cooling upon legal death, followed by long-term storage in liquid nitrogen. Instead of certain death, you and your loved ones could have a chance at rejuvenated, healthy physical revival.

2) Affordable Cryopreservation

The Cryonics Institute (CI) offers full-body cryopreservation for as little as $28,000.

3) Affordable Membership

Become a Lifetime Member for a one-time payment of only $1,250, with no dues to pay. Or join as a Yearly Member with a $75 inititation fee and dues of just $120 per year, payable by check, credit card or PayPal.

4) Lower Prices for Spouses and Children

The cost of a Lifetime Membership for a spouse of a Lifetime Member is half-price and minor children of a Lifetime Member receive membership free of charge until the child turns 18 years of age.

5) Quality of Treatment

CI employed a Ph.D level cryobiologist to develop CI-VM-1, CI's vitrification mixture which can help prevent crystalline formation at cryogenic temperatures.

6) Locally-Trained Funeral Directors

CI's use of Locally-Trained Funeral Directors means that our members can get knowledgeable, licensed care. Or members can arrange for professional cryonics standby and transport by subcontracting with Suspended Animation, Inc.

7) Funding Programs

Cryopreservation with CI can be funded through approved life insurance policies issued in the USA or other countries. Prepayment and other options for funding are also available to CI members.

8) Cutting-Edge Cryonics Information

Members currently receive free access to Long Life Magazine online or an optional paid print subscription, as well as access to our exclusive members-only email discussion forum.

9) Additional Preservation Services

CI offers a sampling kit, shipping and long-term liquid nitrogen storage of tissues and DNA from members, their families or pets for just $98.

10) Support Education and Research

Membership fees help CI, among other things, to fund important cryonics research and public outreach, education and information programs to advance the science of cryonics.

11) Member Ownership and Control

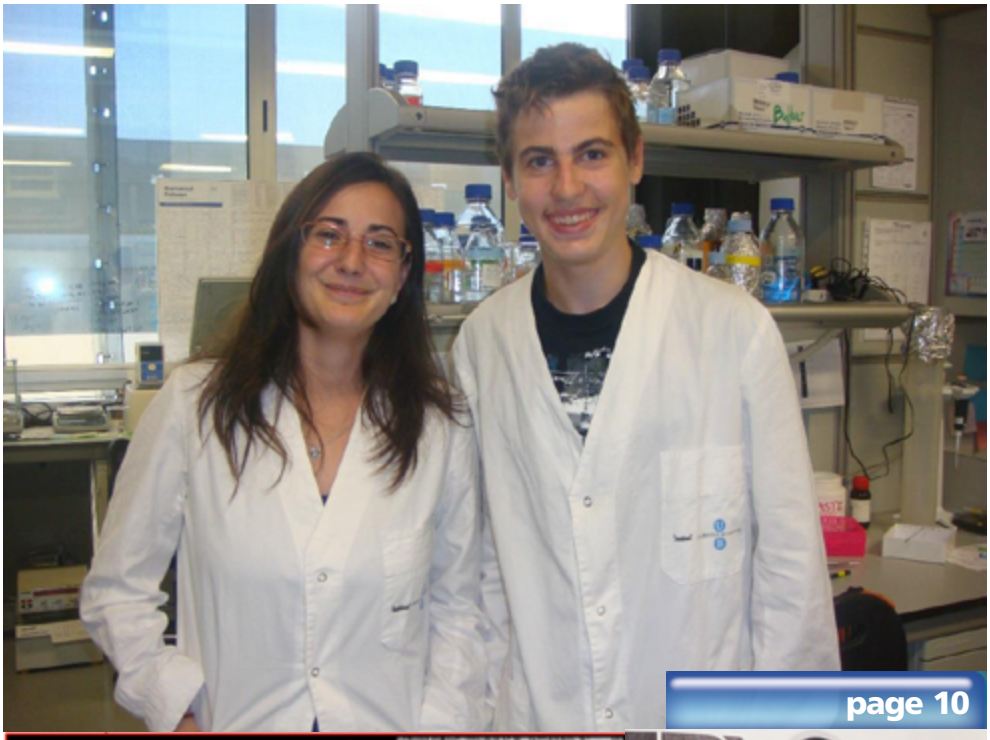
CI Members are the ultimate authority in the organization and own all CI assets. They elect the Board of Directors, from whom are chosen our officers. CI members also can change the Bylaws of the organization (except for corporate purposes).

The choice is clear: Irreversible physical death, dissolution and decay, or the possibility of a vibrant and joyful renewed life. Don't you want that chance for yourself, your spouse, parents and children?

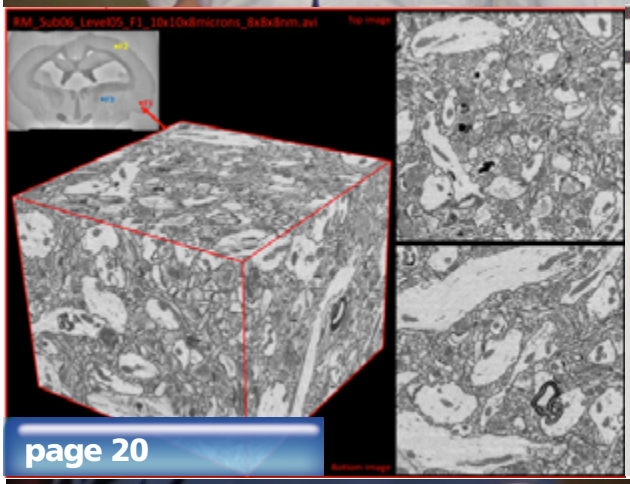
To get started, contact us at:

(586) 791-5961 • email: cihq@aol.com

Visit us online at www.cryonics.org



page 10



page 20

page 17

page 07

LONG LIFE MAGAZINE

A publication of the Immortalist Society

ORGANIZATION NEWS

FEATURE STORIES

ONLINE PDF HYPERLINK COMPATIBILTY

Since different browser configurations handle pdf links differently, if you have trouble opening any hyperlink(s) in the magazine, try these steps:

1. "Copy and paste"or manually type the hyperlink or email address into your browser or your email application's address field.
2. Download the pdf file to your desktop. Open downloaded file in Adobe Reader or your preferred PDF viewer.
3. Change PDF viewing settings / extensions on your browser (*advanced users only*)
4. Try a different browser (especially if you're using Internet Explorer.) We recommend Google Chrome.

You've signed up for Cryonics Now what should you do?

Welcome Aboard! You have taken the first critical step in preparing for the future and possibly ensuring your own survival. Now what should you do? People often ask "What can I do to make sure I have an optimal suspension?" Here's a checklist of important steps to consider.

- ☐ Become a fully funded member through life insurance or easy pre-payments

  Some members use term life and invest or pay off the difference at regular intervals. Some use whole life or just prepay the costs outright. You have to decide what is best for you, but it is best to act sooner rather then later as insurance prices tend to rise as you get older and some people become uninsurable because of unforeseen health issues. You may even consider making CI the owner of your life insurance policy.
- ☐ Keep CI informed on a regular basis about your health status or address changes. Make sure your CI paperwork and funding are always up to date. CI cannot help you if we do not know you need help.
- ☐ Keep your family and friends up to date on your wishes to be cryopreserved. Being reclusive about cryonics can be costly and cause catastrophic results.
- ☐ Keep your doctor, lawyer, and funeral director up to date on your wishes to be cryopreserved. The right approach to the right professionals can be an asset.
- ☐ Prepare and execute a Living Will and Power of Attorney for Health Care that reflects your cryonics-related wishes. Make sure that CI is updated at regular intervals as well.
- ☐ Consider joining or forming a local standby group to support your cryonics wishes. This may be one of the most important decisions you can make after you are fully funded. As they say-"Failing to plan is planning to fail".
- ☐ Always wear your cryonics bracelet or necklace identifying your wishes should you become incapacitated. Keep a wallet card as well. If aren't around people who support your wishes and you can't speak for yourself a medical bracelet can help save you.
- ☐ Get involved! If you can, donate time and money. Cryonics is not a turnkey operation. Pay attention and look for further tips and advice to make both your personal arrangements and cryonics as a whole a success.

CRYONICS INSTITUTE
Technology for Life

LONG LIFE

A quarterly publication of the

Immortalist Society

24355 Sorrentino Ct. Clinton Township MI 48035-3239

President: York W. Porter Vice-President: Debbie Fleming
Secretary: Royse Brown • Treasurer: Rich Medalie

Volume 48 Number 1
First Quarter, 2016

PRINT EDITION SUBSCRIPTION PRICES :
Single Subscriptions delivered by mail in the USA $35 per year. Single Subscriptions delivered by mail elsewhere $40 per year. Please make your payment to the Immortalist Society. The mailing address is 24355 Sorrentino Court, Clinton Township, Michigan 40835. For PayPal payments, please use the PayPal website and the payee address of immsoc@aol.com. If you wish to pay with VISA, Mastercard, or American Express without using PayPal, please phone 586-791-5961 and have your credit card information handy.

CI EXECUTIVE REPORT

Dennis Kowalski - President, Cryonics Institute

Hello everyone - there are a lot of exciting new things to report already this year at the Cryonics Institute. First, recognizing our increased growth and subsequent workload, we decided it was time to add some depth at the CI Facility in terms of full-time staff. I am very happy to welcome Hillary McCauley as our newest employee. As of December of 2015, Hillary was hired as a Perfusion Specialist and Office Administrator. We have worked with Hillary on several past occasions, including the gold standard cryoperfusion of Aaron Winborn. She is both experienced and licensed to surgically access and perform patient perfusions. We're confident Hillary will be a hardworking, intelligent and friendly asset to CI and our members. So if you see her at CI or speak with her on the phone be sure to say hello and welcome her aboard!

Hillary has been aggressively going through member files and updating paperwork such as contract funding and other important information, so don't be surprised if you see her name in emails as well. If you want to help yourself and Hillary, please send in your proof of contract funding on an annual basis.

We have received some generous donations from David and Connie Ettinger to replace our entire roof and start some exciting new research. Thank you both for your level of commitment. There are too many other generous donors to mention here, but, rest assured, you all are making a noticeable difference and you have the gratitude of everyone in the organization.

We are launching a new Research Initiative focusing on the latest vitrification procedures in organ preservation. Recent discoveries have shown dramatically improved tissue viability and reduced toxicity. Our hopes are to use what we learn to directly improve our patient perfusions here at CI, giving our members the latest and best technology coming from the cryobiology community. If you are interested in donating to cryonics research you can either give now directly to CI at cryonics.org/donate, which frees up operational expenses to invest in more research, or you can specify that you would like your money to go directly to research. We have full funding for our 2015 and 2016 research projects, but we are always taking donations for 2017 and beyond. Money invested helps CI to bring the best service to you and your families when you truly need it most.

Great job and thanks to director Stephan Beauregard who has helped to push our Facebook membership up past the 10,000 mark. Kudos and thanks to member Shannon Blevins who has also helped our outreach efforts by growing CI's Twitter account to over 900 followers. The new CI newsletter has reached past 1,400 subscribers and continues growing.

Reaching out to people with these social media venues has proved to be a very useful tool in our efforts to spread positive news about cryonics and the Cryonics Institute. If you haven't joined our social media channels, please take some time to do so by following the links below.

I have received a few emails from concerned CI members who asked me to mention and/or make a correction to an older reprint of a recently published article entitled "The Case for Whole body Cryopreservations" by Michael B. O'Neal, Ph.D. and Aschwin de Wolf.

While the article as titled makes a strong case for whole body cryopreservations, it also says that "the default procedure at the Cryonics Institute is to perform cryoprotective perfusion with a vitrification agent for the upper body and give the rest of the body a straight freeze". This has not been the case for several years and our website has been corrected to reflect the current standard, which is to perfuse the head and body at virtually the same time. This is important to clarify and could result in the implication that CI's whole body cryopreservations are not being done to the highest

current standard. I can attest that not only are our cryopreservations performed to the highest standards, but that they are also some of the most affordable in the industry. We take great pride in being able to delivery this type of quality to our members. High standards and affordability translates potentially into more lives saved. That's not a trivial point.

Many people are seeing and talking about the positive changes at CI and it is bringing in more donations and noticeable growth in our membership. I am happy to announce that last year we hit record membership and the trend is increasing. Those numbers still seem small when you think of all the people of the world who are dying needlessly, but it is empowering to see us heading in the right direction.

In short, we continue to improve our facility, our operation, and our staffing levels have increased. We have new research initiatives and both interest and membership are growing at a faster pace. I am very excited and happy about what I see.

As always, I encourage members to take an active role in volunteering for one of the many initiatives and projects we have on our "to do" list. If you have special skills in programming, public relations, web development, science or just a desire to help out, please sign up at our Volunteer Page. This is a new feature on the web site, so watch for updates on volunteer projects and opportunities online and in future issues of the CI Newsletter.

We need your help to make CI stronger and especially for members to pre-plan their suspension arrangements so that we all have the best possible chance at extended life. Remember, we are all part of a cooperative organization, and you have the opportunity and responsibility to improve your own suspension through the efforts you put forth in pre-planning. We have provided a suspension checklist for you to follow and resources to help you prepare, so I urge you to take advantage of what we have available and start your suspension planning now.

Make the future yours!

Joe Kowalsky Continues to Spread the Word!

Joe Kowalsky, member of the Board of Directors of the Cryonics Institute, head of the Immortalist Society's Cryoprize efforts, and long time cryonics advocate, recently spoke on behalf of cryonics as indicated below. Joe continues to "spread the word" whenever and wherever he can about the world changing concept of cryonics. Readers should note that there may be some slight editing of Joe's talk in the text given below and it may vary, slightly, from the presented (spoken) version. Please note the clickable links in the document which may, for those who are reading the "print version" of Long Life, be simply typed into the "address bar" of most web browsers where one can enjoy Joe's excellent speaking style and skills for one's self.

Joseph Kowalsky, J.D. AIF®
A Director and CIO of the Cryonics Institute

Greetings friends!

I had the honor of being asked to speak at the 2b Ahead Futurist conference in Wolfsburg Germany in June, 2015 before several hundred business people and CEOs, and more recently at the Church of Perpetual Life in Hollywood, Florida at the end of January, 2016.

The Church of Perpetual Life is a science based church. It is called a church because it is a place of faith – in this case faith that science will overcome aging and death.

I believe that an important first step in achieving viable cryonic suspension and revival is the successful freezing and revival of individual organs – specifically for organ transplant purposes. And this is a laudable and necessary effort in its own right! Organ transplantation is hugely important AND well accepted by society at large. I hope you enjoy the talk, maybe learn something that you find edifying, and share it with as many people as you can!!!

The link to my talk in Florida is: https://www.youtube.com/watch?v=OXUfKYHF220

(The link to the talk I gave in Germany is: http://www.2bahead.com/nc/de/tv/rede/video/how-will-being-human-change-when-humans-can-change-themselves-and-what-we-can-do-today-to-bring-this/?PHPSESSID=657fff25833573772565e5cd50a8dea6;

The other talks at the futurist conference are at: http://www.2bahead.com/nc/de/tv/event/zukunftskongress-2015/)

Transcript:

Yes, I am a recovering lawyer!

Thank you, Neal VanDeRee. Thank you for welcoming me into your home, your hearts, and your family

In June, I spoke at the 2b Ahead Futurist Conference in Wolfsburg, Germany. The talk prior to mine was by Dr. Jose Cordeiro of Singularity University, who spoke about amazing developments in technology. He began by reminding us of the great computers of the late 1970s and early 1980s. We used punch cards that held a whopping 1000 bytes -- 1 k -- of information. Then we stepped up to floppy disks – which also held 1 k of information. The advantage over the punch card was not the quantity of information stored, but that they could be changed, erased, reused. 30 years ago, then, you had – as he said in German – Ka and another Ein Ka which, added together, is ka-ka. He went on to say that 30 years from now the multi-gigabyte flash drives that we use today will be considered ka-ka

In the 1970s, I was involved with Cordero's computers when we moved from mainframes and dumb terminals – similar to today´s cloud--to PCs for a few very good reasons:

Speed - you don't need to reach across space to get information from a shared server

Security- you store your stuff on your computer.

Today, speeds are so much faster for both computer processing and transmission that people think it has become insignificant. It hasn't. Especially as the information stored and programs used become larger and more complex. I should not be faster than my computer - which is happening more as more is stored in the cloud.

And security remains a problem. We transmit so much over the internet that computer breaches have become common, but it is still nice to have my own information on my own machine with my own firewall if for no other reason than that it may not be on a hackers radar screen.

Loud proponents argue that they have far more money and reason to spend it protecting against hackers. True. But then they are fewer targets as I mentioned and . . . it presumes that the cloud-minders don't steal our information for their own use or to sell to others. Of course with artificial intelligence– which is on the horizon -- and human computer integration all of this could soon change – but in the mean time it remains worth considering

I bring this up, well, because I do not like the cloud. I think it has serious flaws and potential danger.

And because as we look to the future, we need to also look to the past to ensure that we do not repeat mistakes which we had already made and to which we had perhaps even found solutions with more powerful technology

Cryonics Institute - www.cryonics.org

As you have heard, my name is Joseph Kowalsky. I am on the Board of Directors of the Cryonics Institute. Cryonics is the freezing of human bodies to preserve them at the state they were in when death occurred, until medical technology may revive and repair them. An ambulance to the future. It is amazing and wonderful to me that most, if not all of, you already know this! What a change from not so long ago And I don't mean just in this forum, where you might expect to have a larger number of people familiar with cryonics. I mean everywhere.

The Cryonics Institute was founded in 1976 by Robert Ettinger "the father of Cryonics" based on the idea that we are doing a public service as well as working on our own behalves. It is a non-profit corporation.

The cost of whole body freezing - and no, we do not freeze just heads - is $28,000 - not much more than an expensive funeral. We want to be that "ambulance to the future" for as many people as we are able to. We often hear that cryonics is some kind of money-making scam. Well, if it is, we are doing it the wrong way, since most of us involved are volunteers and not only don't make a penny off of this but usually put in not just time but also our own money to a greater or lesser extent

In fact, all of us now involved with the organization are volunteers with the exception of one full time paid employee and one part time employee. (Editor's Note: This has changed since Joe's talk. See the article on Hillary McCauley in this issue). However, we have a large endowment - and no debt - to add to our employment rolls if necessary

The difficulties of suspended animation via cryonics used to relate mostly to crystallization which occurs when water freezes. If you have ever seen a magnified snow flake you know that its beauty comes from the myriad points that stick out from the flake. But these points are sharp. As water freezes in the body, these crystals with sharp points form and often pierce the cell membranes. Since the body is over 70% water that was a big issue. And it is why many scientists said that – at least in the early days – trying to revive cryopreserved bodies would be like trying to revive hamburger.

We began removing the blood, and replacing it with a glycerol "antifreeze". This helped somewhat. With further research, we developed a fluid that allowed vitrification. Vitrification skips the crystallization process of freezing and moves straight from liquid to a glassy solid frozen state. We can now preserve the cell structure quite well throughout the brain and body. Some difficulties remain. There is occasional small cracking. But the bigger problem is that the current vitrification solution is toxic. So when, if we do revive a patient, and I will talk later about why I believe we will be able to do this, when we do revive a patient, we will have to find a way to quickly remove virtually all of the vitrification solution before it poisons the body. Work continues on this as well as on developing a non-toxic vitrification solution. At the same time, we are looking to future science to develop damage repair methods.

I have been involved with cryonics since I was 13 years old. The typical paradigm -- birth, school, marriage, children, move to Florida, die – never made sense to me. There is so much out there to see, to learn, to do, to be . . . and so little time. When I first became involved, most did not know what cryonics was. And of those that did, most thought it crazy. Today most think it a reasonable possibility . . . though not for them! Well, it is a step forward.

I recently read a quote from Dr. Stephen Hawking, "Intelligence is the ability to adapt to change." Humans are good at that. We are resilient and malleable. What is interesting and what he did not mention there is that for millennia – since we came up with tools and fire – we have been making some of the changes to which we have to adapt. And that is what we are talking about today.

We can't control everything – and I would not want to – but we can control some things. A caveat to Dr Hawking's statement is that an important part of creating a future as we want it to be is to make people see it as "normal".

My niece got married a few years ago and I said the following to her and her new husband (and those gathered at the wedding). One day, I said to my new nephew, you will walk in and my niece will be in the living room reading on a chair that is upside down. You will say to her, "What are you doing? Why is the chair upside down?" And she will say "It's Wednesday" and when you continue to look blankly at her she will continue: "This is normal, everybody reads on an upside down chair on Wednesday, my family always did it this way." And I said to my niece, one day you will walk in and your beloved will be sitting on the kitchen table eating spoonful after spoonful of butter while playing a banjo. And you will say to him, "What are you doing?" And he will say, "I had the hiccoughs." And as you stare at him blankly, he will continue, "This is a surefire cure to hiccoughs, its normal, everybody does it, my family always did this!"

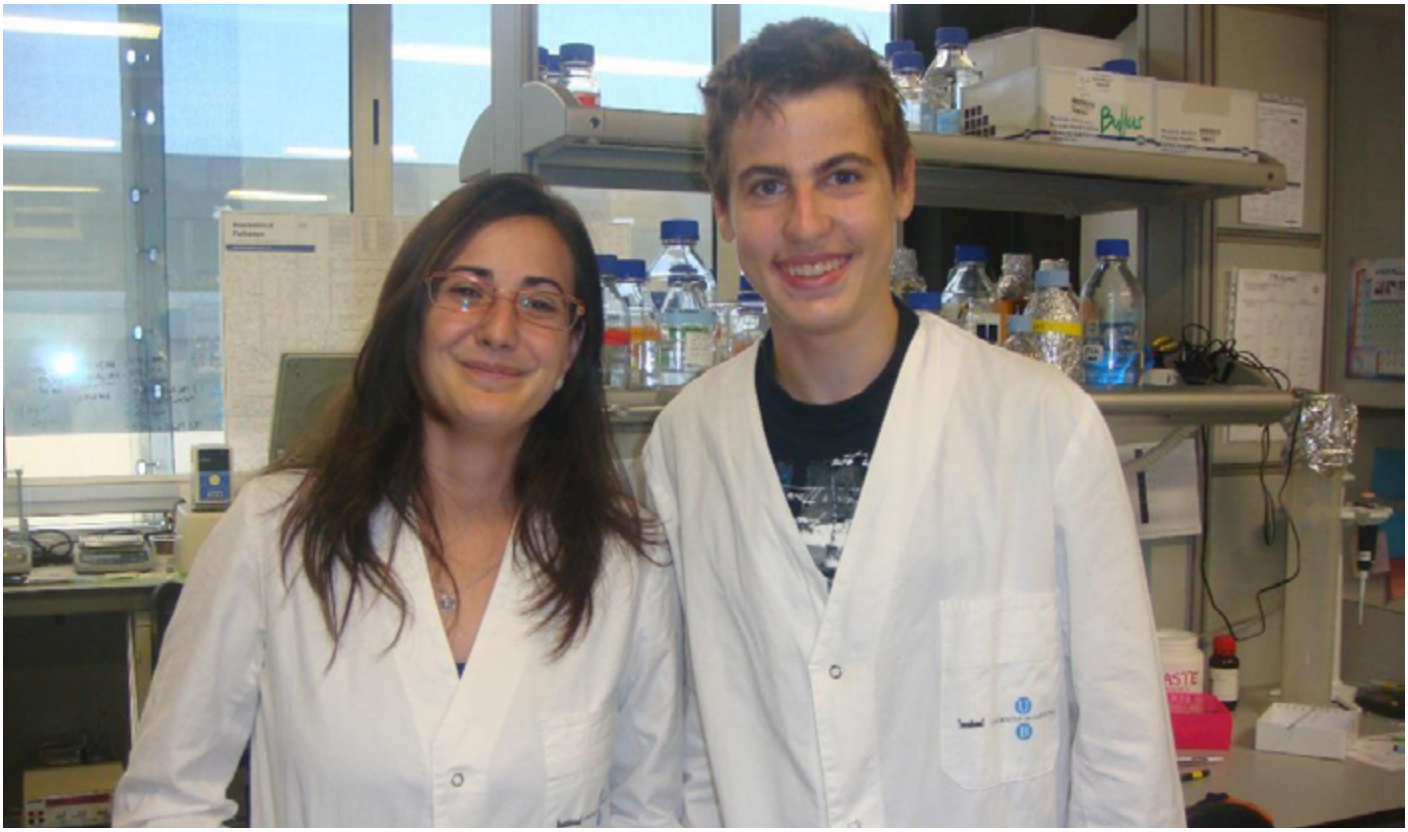
Those who are married or have lived with someone for a while know exactly what I am talking about. The rest of you . . . you will have to take our word for it. "Normal", to a large extent, is what we grew up with. We find all sorts of reasons and rationalizations for why it is right or better than other ways. But often, the feeling of rightness is there deep inside of us. And our smart and sneaky brains come up with reasons to justify it.

Or you can look at different customs in different societies and what they think is absolutely normal and which we think is silly or crazy. While I hope we respect many different ways of life, we don't do them even though these people will tell you that it is important or necessary. Many thought [think?] of those of us involved with cryonics as arrogant, delving into the territory of God. I see it as the opposite. We are modestly saying that we do not know when death occurs.

It is 1890, you are walking down the street and someone drops on the street with a heart attack. A doctor pronounces him dead. You run up with a defibrillator, and then do CPR – and you are arrested for desecrating a dead body. They see you sending an electric shock through a dead body and making it jump, kissing a dead man, and banging on his chest. Its macabre!

Today we know that the person may not be dead yet. (Any Monty Python fans here?) Cryonics says that today we are equally ignorant.

CONTINUES Page 25



A young voice in cryonics research

By Ilir Dema

A couple of years ago I received an email sent to csc4@cryocdn.org and forwarded to my personal email from a student of first baccalaureate in Barcelona. Scratching my head and thinking whether the email was genuine or spam, I finally decided to open it. It was one my best decisions.

Well, I better introduce myself: Ilir Dema, mathematician, computer scientist, educator, CI long-time member, Cryonics Society of Canada long-time member and director, Toronto Local Group volunteer; in other words, hardcore cryonicist. Always a contributor and a firm believer in the power of science to shape the future of humanity.

So, back to that day, the sender, Aleix Pujadas Rello, was looking forward to doing a school research project in cryonics. The intuition of the teacher whispered in my ear that this student was very serious about it. The passage of time proved that he was more serious than I could have ever thought in my wildest imagination.

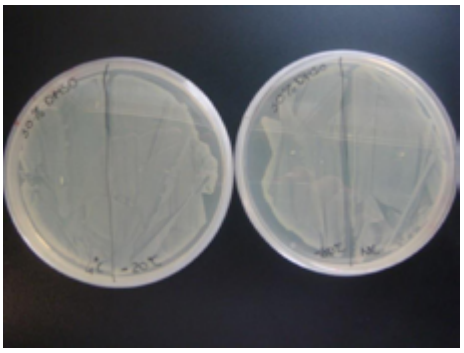
Aleix insisted on the quality of the experimental part of his research work, the hallmark of a true scientist. In this respect, he took a step that few people have had the nerve to go through in cryonics. This puts him in the line of the numerous experimentalists that have made groundbreaking contributions in the field.

In the theoretical part of his thesis, Aleix walks the reader through a concise, but extremely accurate description of cryonics, historical developments, current status of cryonics facilities worldwide, and what is even more important, to the contemporary application of cryonics and related technologies into embryo preservation and cancer research and treatment.

Under the direction his adviser, Professor Ana Araceli Guarinos Mahamud, in collaboration with Dr. Nerea Gallastegui, he designed a series of experiments to observe the response of different organisms and organs (the bacteria E.coli and chicken liver) and molecules (protease) under different temperatures and using different cryoprotectants .

In his E.Coli experiment, Aleix did freeze four samples from the same batch at different temperatures (4C , -20C , -80 C, and -196C) using three different cryprotectants: glycerol, DMSO, and sucrose. A fifth sample was maintained as a control group. Best results (in terms of survival of organisms after thawing) were achieved at temperatures -80C and -196C, using DMSO at a concentration of 30% as cryoprotectant.

The results of the E.Coli experiment contrast with poor results obtained at low temperatures with chicken liver. The most likely reason



DMSO samples at different concentrations and different temperatures.

for this discrepancy is believed to be the lack of perfusion in the chicken liver experiments.

Aleix's third experiment with protein cryopreservation, confirms that the best preservation (in terms of the smallest amount of protein denaturation) was achieved again using DMSO at liquid nitrogen temperature.

By confirming the advantages of cryopreservation at liquid nitrogen temperatures, and also bringing continued attention to the negative effect of the lack of perfusion, Aleix has confirmed the best practices used in modern cryonics are basically sound. He has also introduced himself as a powerful future voice in modern cryonics research. I am proud that I could modestly support his work by giving an interview for his paper and also giving some modest advice on various online information resources for his research.

Right now Aleix studies chemistry at the University of Barcelona. He can be reached at aleixpujadasrello@gmail.com.

LONGECITY

Alvin Steinberg

Alvin Steinberg, a member of the Cryonics Institute, sent us this brief but informative article about an organization called LongeCity. According to Alvin, it is an organization that is interested in an unlimited life span and which has, at present, around 30,000 on-line followers.

Alvin noted in his e-mail to us: "LongeCity is not affiliated with any other organization. We help support aging research and discuss longevity matters on line. It is our hope that we will set up an Internet radio station to give news stressing medical research, especially longevity research."

LongeCity is a membership organization, which does advocacy and research for unlimited life spans. It has a forum on its website, www.longecity.org, which allows its users, both members and non-members, to express their opinions and give suggestions. It is potentially possible for forum participants to start groups to accomplish their objectives. LongeCity will sometimes contribute a small amount of money to help in this endeavor.

You should make up an on line name to use the forum. I use my first name, alvin. Some make up names, including weird ones.

To contact management click, "Contact". You can then ask a question of management. You must log in for this service.

Viewers of the forum often send replies to your written ideas. The forum covers the entire country and some participants live outside the United States. Some cryonacists, from both cryonics organizations, participate in the forum. About 15,000 participants use the forum.

It is not necessary to join LongeCity in order to participate in the forum. For those willing to join, the general membership fee is $50.00 a year. Students and seniors can join for $25.00 a year. The Life Time membership fee is $500.00.

One of the headings on the sign in page is, "Media". That consists of 31 Podcasts about life extension. The number of Podcasts increases monthly. Many of the participants are major scientists. There is also a film about life extension.

In order to enter LongeCity simply type Longecity in the search bar and you are in. To participate in the Forum it is best to sign in.

Cryonics Institute Membership Statistics:

As of April 2016, the Cryonics Institute has 1,273 members, up 34 from our last report. Of the 1,273 Members, 188 have arrangements for Suspended Animation Standby and Transport.

There are 137 human patients and 120 pet patients in cryopreservation at CI's Michigan facility.

CI continues to be an industry leader in terms of both membership and practical affordability for all.

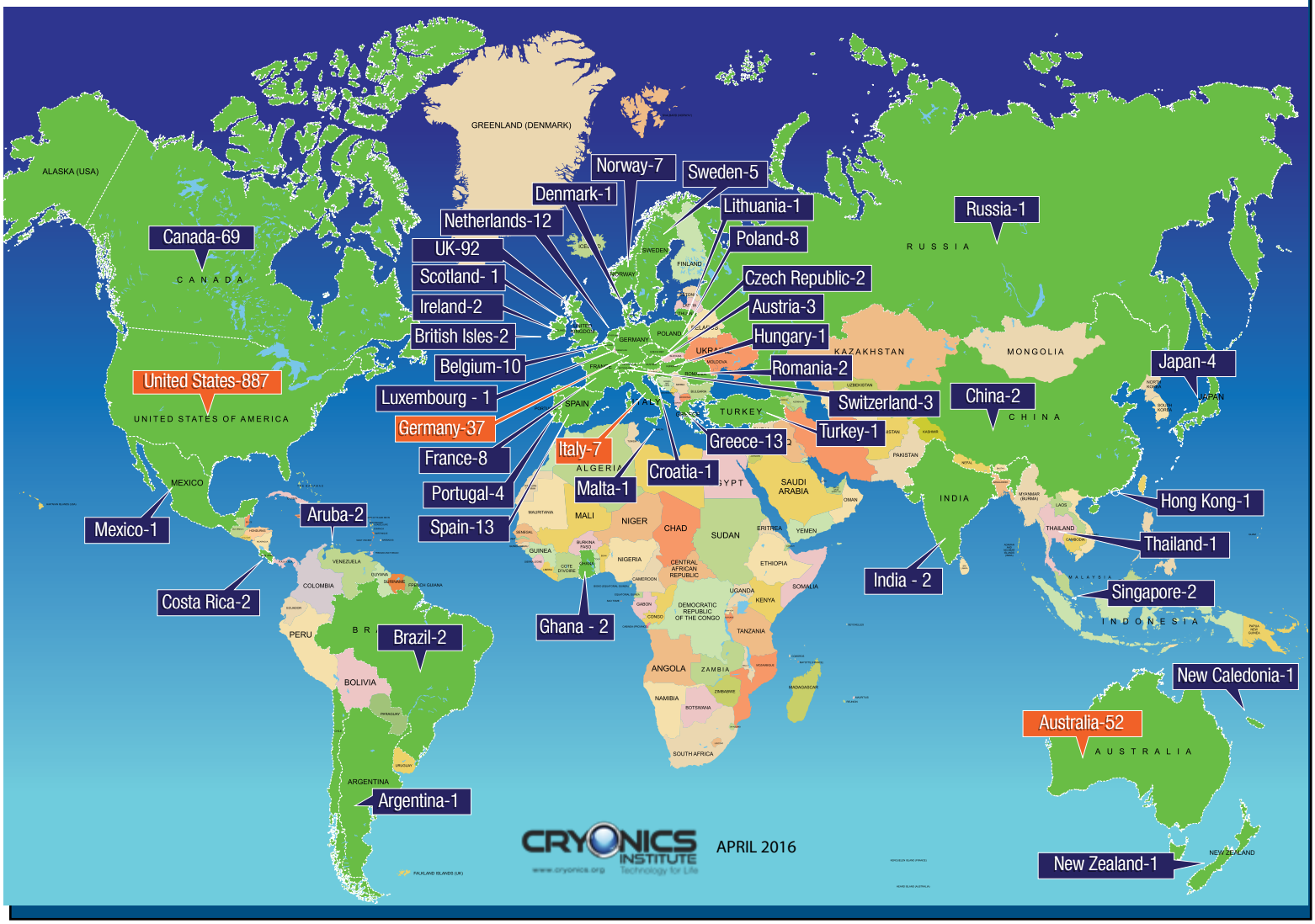
CI MEMBERSHIP

Increase in Membership since last issue

New Country

Members	1,273	Pets	120
SA	188	DNA/Tissue	226
Patients	137		

TOTAL 1,410



Worldwide Cryonics Groups

AUSTRALIA: The Cryonics Association of Australasia offers support for Australians, or residents of other nearby countries seeking information about cryonics. caalist@prix.pricom.com.au. Their Public Relations Officer is Philip Rhoades. phil@pricom.com.au GPO Box 3411, Sydney, NSW 2001 Australia. Phone: +6128001 6204 (office) or +61 2 99226979 (home.)

BELGIUM: Cryonics Belgium is an organisation that exists to inform interested parties and, if desired, can assist with handling the paperwork for a cryonic suspension. The website can be found at www.cryonicsbelgium.com. To get in touch, please send an email to info@cryonicsbelgium.com.

BHUTAN: Can help Cryonics Institute Members who need help for the transport & hospital explanation about the cryonics procedure to the Dr and authorities in Thimphou & Paro. Contacts : Jamyang Palden & Tenzin Rabgay / Emails : palde002@umn.edu or jamgarnett@hotmail.co Phones : Jamyang / 975-2-32-66-50 & Tenzin / 975-2-77-21-01-87

CANADA: This is a very active group that participated in Toronto's first cryopreservation. President, Christine Gaspar; Vice President, Gary Tripp. Visit them at: http://www.cryocdn.org/. There is a subgroup called the Toronto Local Group. Meeting dates and other conversations are held via the Yahoo group. This is a closed group. To join write: csc4@cryocdn.org

QUEBEC: Contact: Stephan Beauregard, C.I. Volunteer & Official Administrator of the Cryonics Institute Facebook Page.

For more information about Cryonics in French & English: stephanbeauregard@yahoo.ca

DENMARK: A Danish support group is online. Contact them at: david.stodolsky@socialinformatics.org

FINLAND: The Finnish Cryonics Society, (KRYOFIN) is a new organization that will be working closely with KrioRus. They would like to hear from fellow cryonicists. Contact them at: kryoniikka.fi Their President is Antti Peltonen.

FRANCE:
SOCIETE CRYONICS de FRANCE Roland Missionnier would like to hear from cryonicists in Switzerland, Luxembourg and Monte Carlo, CELL: (0033) 6 64 90 98 41, FAX: (0033) 477 46 9612 or rolandmissonnier@yahoo.fr

Can help Cryonics Institute Members who need help for the transport & hospital explication about the cryonics procedure to the Dr and authority in Toulouse Area. Contact : Gregory Gossellin de Bénicourt / Email : cryonics@benicourt.com Phone : 09.52.05.40.15

GERMANY: There are a number of cryonicists in Germany. Their homepage is: www.biostase.de (English version in preparation.) if there are further questions, contact Prof. Klaus Sames: sames@uke.uni-hamburg.de.

GREECE: Greek Cryonics Support Group. Sotiris Dedeloudis is the Administrator. Find them at: http://www.cryonics.gr/

INDIA: Can help Cryonics Institute Members who need help for the transport & hospital explication about the cryonics procedure to the Dr and authority in Bangalore & Vellore Area. Contacts : Br Sankeerth & Bioster Vignesh / Email : vicky23101994@gmail.com Phones : Bioster / 918148049058 & Br Sankeerth / 917795115939

ITALY: The Italian Cryonics Group (inside the Life Extension Research Group (LIFEXT Research Group)) www.lifext.org and relative forum: forum.lifext.org. The founder is Bruno Lenzi, contact him at brunolenzi88@gmail.com or Giovanni Ranzo at: giovanni1410@gmail.com

JAPAN: Hikaru Midorikawa is President Japan Cryonics Association. Formed in 1998, our goals are to disseminate cryonics information in Japan, to provide cryonics services in Japan, and eventually, to allow cryonics to take root in the Japanese society. Contact mid_hikaru@yahoo.co.jp or http://www.cryonics.jp/ index.html

NEPAL: Can help Cryonics Institute Members who need help for the transport & hospital explanation about the cryonics procedure to the Dr and authorities in Kathmandu. Contact : Suresh K. Shrestha / Email : toursuresh@gmail.com Phone : 977-985-1071364 / PO Box 14480 Kathmandu.

NETHERLANDS: The Dutch Cryonics Organization (http:// www.cryonisme.nl) is the local standby group and welcomes new enthusiasts. Contact Secretary Japie Hoekstra at +31(0)653213893 or email: jb@hoekstramedia.nl

* Can help Cryonics Institute Members who need help, funeral home, transport & hospital explication about the cryonics procedure to the Dr and authority at Amsterdam with branches in other cities. Contact : Koos Van Daalen / Phone (24 Hours) +31-20-646-0606 or +31-70-345-4810

NORWAY : Can help Cryonics Institute Members who need help for the transport & hospital explication about the cryonics procedure to the Dr, funeral home and authority at Sandvika. Contacts : Gunnar Hammersmark Sandvika Begegravelsesbyraa / Phones : 011-47-2279-7736

PORTUGAL: Nuno & Diogo Martins with Rui Freitas have formed a group to aid Alcor members in Portugal. Contact: nmartins@nmartins.com or visit www.cryonics.com.pt/

RUSSIA: KrioRus is a Russian cryonics organization operating in Russia, CIS and Eastern Europe that exists to help arrange cryopreservation and longterm suspension locally, or with CI or Alcor. Please contact kriorus@mail.ru or daoila.medvedev@mail.ru for additional information or visit http://www.kriorus,ru. Phone: 79057680457

SPAIN: Giulio Prisco is Secretary of the Spanish Cryonics Society. Website is http://www.crionica.org.sec. He lives in Madrid and he's a life member of CI and is willing to serve as a contact point for Europeans. He can be contacted at: cell phone (34)610 536144 or giulio@gmail.com

*** SWITZERLAND (new entry):**
www.CryonicsSwitzerland.com or www.ria.edu/cs

UNITED KINGDOM: Cryonics UK is a nonprofit UK based standby group. http://www.cryonicsuk.org/ Cryonics UK can be contacted via the following people: **Tim Gibson:** phone: 07905 371495, email: tim.gibson@cryonics-uk.org. **Victoria Stevens**: phone: 01287 669201, email: vicstevens@hotmail.co.uk. **Graham Hipkiss**: phone: 0115 8492179 / 07752 251 564, email: ghipkiss@hotmail.com. **Alan Sinclair:** phone: 01273 587 660 / 07719 820715, email: cryoservices@yahoo.co.uk

Can help Cryonics Institute Members who need help, funeral home, transport at London. Contact: F.A. Albin & Sons / Arthur Stanley House Phone: 020-7237-3637

INTERNATIONAL: The Cryonics Society is a global cryonics advocacy organization. Website is www.CryonicsSociety.org. They publish an e-newsletter *FutureNews*. Phone: 1-585-643-1167.

Please note, this list is provided as an information resource only. Inclusion on the list does not constitute an endorsement by Long Life magazine or our affiliated organizations. We urge our readers to use this list as a starting point to research groups that may meet their own individual needs. We further note that readers should always use their own informed judgment and a reasonable amount of caution in dealing with any organization and/or individual listed.

Economies of Scale, First Response, and Funding Reanimation: Their importance to CI and to ACS

By Jim Yount, Governor, American Cryonics Society, Inc.

Economies of Scale and Patient Numbers

I could not say it better or more succinctly than did CI President Dennis Kowalski:

"Economies of scale actually play a big role in cryonics facilities. It takes almost as much to run a facility with 5 patients as one with 100." *(Personal email to author and in an email message to CI on-line discussion group.)*

Okay. So just what are "economies of scale" as they apply to a cryonics facility? When you set up many businesses you are going to need a place to work, perhaps a manufacturing plant, a garage or a store-front -- all depending on what kind of business you are in.

If you are in the frozen people storage business you will need a cryonics facility. This usually means a warehouse-type building with lots of room and high ceilings (for space to hoist patients into the large thermos-bottle like "Dewars" or cryostats). You will to need at least one knowledgeable and skilled employee. Obviously, you will need cryostats: at least one for your first patient plus a backup in case a problem develops with your first people-holding cryostat. All this means that you will need to find a company to make them for you or figure out a way to manufacture them yourself.

You will also need to outfit your facility with various safety devices such as burglar and fire alarm; security cameras; a fire-suppressant sprinkler system. You will need to assure the relevant governmental agencies that you are meeting the various regulations as well as operating your facility in such a manner the agencies deem as safe.

That is all a very simplified description of what you will need to go into the cryonics business in the first place; and up until now we haven't mentioned the various patient preparation costs such as a cool-down box, perfusion equipment, and a patient-preparation room - then there are basic business costs such as accounting expenses, legal expenses, and administrative expenses. Such expenses, - while expected to be ongoing - will need to be set up with part of your going-into-business money.

This set-up cost could be called 'initial capital expenditure.' Until your first patient comes in, you will need an operating budget because, at least to start with, you can expect to operate at a yearly loss. When you do get your first patient that loss will likely accelerate. Why is this? Because you will now have the cost of liquid nitrogen, as well as employee cost to periodically top-off the cryostats with liquid nitrogen and to keep accurate records of the top-offs.

In a way your cryonics facility start-up is like Ford Motor Company producing its first 2016 model car. It has a huge capital outlay just to be able to produce that first car. If one car was all a factory produced and sold, it would have to price that car at several hundreds of millions of dollars just to break even. Ford is only able to make a profit by selling hundreds of thousands of cars because that start-up cost is so great.

So, you are now in business with one cryonics patient and your business is running in the red at an alarming rate. If and when you get your second patient you will have additional money come in and your costs to keep two patients won't be much more than to keep just the one patient. Your cryostat is designed to hold six patients, so cost to keep patient's three, four, five and six will be just a little more than to keep Patient One. You may dream and scheme on how to fill your facility with cryostats and cold customers, but the current market is very small. You may look at the few long-established facilities with patient-loads over 100 with a bit of envy.

The American Cryonics Society, Inc.(ACS) now has 19 patients who came to CI through contract arrangements. There are two more patients designated as ACS patients by the next-of-kin but who came to the CI facility outside provisions of the ACS-CI contract. ACS also has some animal patients and a number of DNA samples cozily tucked away in liquid nitrogen at the CI facility.

There was a time, in the not-so-distant past (no later than the early 1980s) when a frozen population of this size would have about equaled every cryogenically frozen person and animal on earth. That was then and this is now. That being said, it is not as if the world of 2016 is exactly crowded with frozen people. The CI website claims 137 patients, the Alcor website boasts of 144. Just the same, economies

of scale give a substantial competitive edge to companies with facilities who hold over 100 patients to those who hold 20 or so, or those that are just starting out.

Put another way: it makes no sense for ACS to establish and maintain a cryonics facility for this relatively small patient population when CI has a well-maintained cryonics facility that is already established.

Goldilocks and the Three Facilities

At the risk of being just too cute in my subject title and analogy, the path to the CI facility for a number of ACS patients was something like Goldilocks finding a bed to sleep the decades away in cryonic slumber.

Our proverbial Goldilocks was first suspended and put to bed in liquid nitrogen at the Trans Time facility in Emeryville California - she did so as a member and anatomical donation of the Bay Area Cryonics Society that would later change its name to the American Cryonics Society.

In the early 1990s Goldilocks, finding that her first bed was "too expensive" ($5,000 plus per year at that time), moved to the CryoSpan facility in Rancho Cucamonga in Southern California.

Goldilock's rent, in Southern California, was within her budget, about $1,500 per year, but alas for our heroine, the Southern California facility proved "too impermanent," and closed its doors so that poor Goldi moved, yet again, this time to the CI facility near Detroit Michigan.

The Goldilocks of *Three Bears* fame could easily try out one bed and then another until she found one that was "just right". The Goldilocks who is a cryopreservation patient did not have such mobility or volition. Someone else had to look after her best interests and see that she was moved to the affordable cold so she would have a chance to someday wake up to greet the Three Bears or to have real-life adventures. That "someone else" was the American Cryonic Society (ACS). Goldilocks was an anatomical donation of ACS and it was ACS who found her a new, less expensive home and paid her way.

The ACS folks who moved Goldi around did so very reluctantly. Each placement of Goldi was thought, at the time, to be the best that could be done. As things worked out, CI was able to benefit from the economies of scale and thus proved the best choice for Goldi, but "who would have thunk it" at the time Goldi was first frozen? CI was then not even in existence.

If we could wake up Goldilocks and ask her, I think that she would be pleased. It appears that the CI's facility now has a large enough patient population that the economies of scale are favorable. The move to the CI facility was also within Goldi's limited budget. I think she would also be pleased with ACS. In spite of Goldi's travels, she is still frozen where many prior would-be cryonics patients are not. Finally, Goldi would like the fact that she is both a CI member, with all its benefits (except voting!), and an ACS member with its benefits.

The first two facilities that Golilocks called home were not able to attain a patient load large enough for the critical 'economies of scale.'

Local and Not-So-Local Standby and Patient Preparation

In the same email discussion I quoted earlier, Dennis Kowalski made another important point:

"Without a decent standby capability in place then we might as well be all storing simple [DNA] tissue samples for future cloning. On the other hand, once a person is stabilized and prepared properly they can be shipped anywhere in the world for long term storage."

Standby is where a team of people, who are ready to do initial patient cool-down and other first-order preparation, is at the bedside of a patient who desires cryonic suspension. Of course it is not just standing by but also providing this first-response service that is so important. Just after death the patient's body is largely still functional. Most organs will still be viable, but will become unusable for transplant, for example, if too much time elapses following death.

In the best cryonics cases, the initial response team initiates cooling as they maintain flow of oxygen to the body tissues. As the body cools it needs less and less oxygen, but the organs of the body are still viable, including that most important organ: the brain.

For these "best scenario" cases a team such as that assembled by Suspended Animation Inc. is needed. However, there are lots of things that less skilled individuals can do to reduce the time that the cryonics patient is "out in the warm."

While long-term cryonics storage is best centralized in facilities where the economies of scale can keep prices low and efficiency high, it is rare for someone to move in order to be near a cryonics facility when deanimation time is near. People die where they die. Cryostorage is best centralized but death is local.

Both CI and ACS are fortunate to have the services of Suspended Animation, Inc.

available to us. However, Suspended Animation's services do not come cheap and can total as much as CI's entire charge for keeping the patient frozen for perhaps 100 years.

One of the problems with any highly skilled (but pricey) first-response service is that a long standby can prove very expensive for the patient and may exceed the funds he has designated for cryonics. In some cases in the past ACS has been able to supply volunteers or lower-priced helpers to supplement the services of the more highly skilled service provider. Of course getting such help to the patient depends upon our being notified promptly that the patient is at or near death.

For ACS patients, ACS is "on the hook" for this first response. Under some circumstances we may call on Suspended Animation or have local morticians pack the body in ice for shipment to CI. Given enough warning, we may also dispatch volunteers or lower-paid responders to spend the time needed before deanimation occurs, something that could be weeks or even months.

Circumstances may vary greatly as to what services are appropriate. For example, for a patient who has been clinically dead for quite some time, paying tens of thousands of dollars for a company like Suspended Animation is not the best use of the patient's funds. On the other hand, if the patient is well-funded then any efforts that might marginally and questionably improve his preparation may be in order. Cryonics is the *prospect of immortality*, not the certainty of immortality, and value judgment plays a large part as to just what we do to as we attempt to deliver the patient to medical facilities of the future in as good a condition as we can.

Paying for Reanimation

I suspect that almost all of us have wondered and speculated about reanimation, yet there is less discussion, than would seem appropriate, of this important topic on the various on-line cryonics discussion forums. However, this much-ignored topic seems to be coming into prominence in just the past six or seven years.

There are now yearly meetings of a group called the *Asset Preservation Group* for short or in long-speech T*he Options for Safe, Secure and Legal Asset Preservation for Post-Resuscitation Access* (try answering the phone at *that* office!). Both former CI President Ben Best and this author are members of the forum that explores the various ways that individuals can have funds available for emergency use between now and reanimation day and to have a viable "new life fund" upon reanimation. Perhaps you *can* take it with you! This group has mostly concentrated on use of trusts as a way to bring your assets with you into the future.

Many years prior to the current interest in asset preservation for cryonics patients, ACS developed a program with just that in mind. There are so many possible events between now and reanimation day (if reanimation proves possible at all) that it seems like a good idea if a frozen fellow has a little money tucked away for a rainy day!

The ACS asset management program is two-pronged. Many of our patients and prospective patients set up memorial funds through ACS. The patients can benefit from such funds, but not individually but rather only as a member of a group. For example, some of the money thus dedicated may lead to research that gives us better understanding of the possibilities for reanimation of any patient with adequate brain preservation.

Patients may also set up trusts that benefit them alone (the second prong), or, more typically, that benefit all patients or perspective patients but that have some "selfish" provisions that will only benefit the patient who has set up the trust. Such trusts are subject to income taxation though but money the trust gives to research by charitable organizations has the same tax-deductible benefits as when individual taxpayers make charitable donations.

A few years ago one such a trust, set up by an ACS member in suspension at the CI facility, paid half of the cost of the fire-suppressant sprinkler system now installed in the CI facility. That was a "selfish act" in that the frozen ACS member benefited through increased safety. However, all of the patients at the CI facility benefited as well.

The future -- by its very definition -- is uncertain. There may be many circumstances where CI, even with prudent management, finds there are problems not easily remedied by its cash reserve. Trusts friendly to ACS or ACS own funds could provide some of the resources to deal with such unforeseen problems.

It is appropriate that we also note that donations made directly to CI are preferred by some as a means to best ensure future reanimation. For those with the means, such donation as well as setting up trusts and endowing ACS is in order. It is called "not putting all of your eggs in one basket."

To learn more about ACS and its suspension program, go to www.americancryonics.org or www.ca-fl-cryonics.us.

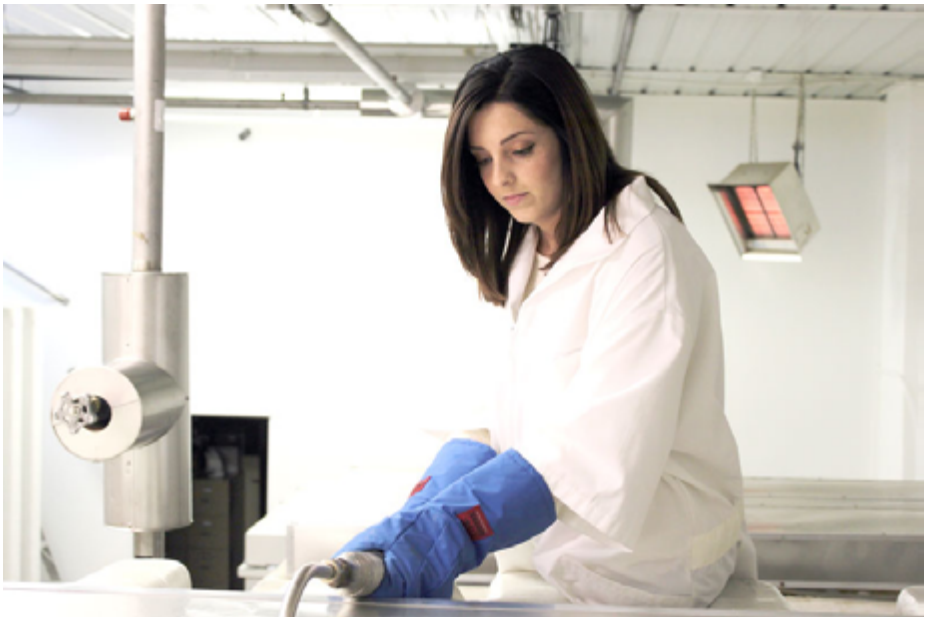
CI Welcomes New Employee

by: York W. Porter
Immortalist Society President

The Cryonics Institute recently announced an addition to its "in house" staff. Hillary McCauley has been hired to work as a Perfusion Specialist and Office Administrator at the CI facility in Clinton Township, Michigan. Ms. McCauley, who was born and raised in Roseville, Michigan in the Detroit area, now lives in Clinton Township. She received her BS degree in Mortuary Science at Wayne State University in 2014 and is a licensed funeral director/mortician in the State of Michigan. She became involved with CI in a tangential fashion at first through cases of CI members dealt with at the Walsh Funeral Home, with which CI has had a long time association.

Ms McCauley is very forth coming that she views her position at CI in some similar ways that she viewed her prior work in traditional funeral homes in the sense of her professional duty to always respect the wishes of the client and their family members. Further, she views her job as one in which it is necessary to always insure that the reliance of members on her as a professional is always well based. As she puts it: "I will do everything necessary to uphold the trust that our members and their families place in us and work towards the best perfusion/suspension possible in each situation".

Ms. McCauley recognizes that in some ways, in spite of her professional training and experience that she is, in part, learning as well as contributing. Every organization is unique in how it handles things and how it specifically operates and, as part of her duties as Office Administrator, it will be necessary to get "up to speed" on the mechanics of how CI does certain things. On the other hand, she says that being a new employee can be an advantage. As she puts it, "Being new to the organization, I have a fresh perspective and can offer new insight."



There is also no doubt about Ms. McCauley's drive and interest in her new job. Again, she says, "I am here to work hard and I am dedicated to our members and will be just as dedicated to them when they become our patients".

It appears to those of us here at Long Life magazine that CI has definitely "hit a home run" here with the addition of an intelligent and dedicated professional whose skills and knowledge set will mesh very nicely with those needed by present and future CI members and CI patients. Ms. McCauley's professional background and her interest and drive in tackling her new job assignment will also be a big asset to those CI members needing information and assistance in making sure that efforts on their and their loved ones behalf will be done in a meticulous and well-informed fashion. Members at a distance who will be dealing, in many cases, with the assistance of a local funeral home, will definitely benefit from the fact that the local professional will be dealing with someone with Ms. McCauley's background as well as CI employees who have years of additional experience in the specific procedures and needs of CI members. Welcome aboard to the wonderful world of cryonics, Ms. Hillary McCauley!

Caveat 'Reador'

by: York W. Porter, Immortalist Society President

Subtitled... "We Just Ain't Perfect..."

In what I hope is an obvious twist and an attempt at humor (with some "fractured" Latin spelling added in) on the more well known saying of "Caveat Emptor" ("Let the buyer beware!"), the title of this article is worded to indicate, as anyone who has read this (or any other) magazine for a while can easily conclude, that, well, "We just ain't perfect...." The staff of the magazine tries hard to be as clear as it can in its writing and we try as hard as we can to be as accurate in our facts as well. Nevertheless, on occasion, we can give an inaccurate impression of things, however hard we try.

In our latest miscombobulation (if there is such a word), readers of the article on Whole Body Cryopreservation, featured in a recent issue, may have gotten the impression that the present default at the Cryonics Institute in terms of patient preparation is different from what it is at present . (See Dennis' Kowalski's article later in the issue for the particulars). The article we used, being a reprint, had a "few miles" on it and it may have given an accidental misimpression of things. Our apologies if it did.

Which brings us to the more important point for readers. We do try hard to be as accurate and clear as we can but, due to time and space limitations, as well as our own human frailties and limitations of time, we're going to fall short on occasion. We try to provide space in the magazine for a myriad number of viewpoints, not all of which can, by their very nature, be equally valid.

While we try to do some weeding out of what seems to be some obviously erroneous stuff, we also do try to give writers and readers some leeway to present, within limits, their viewpoint in their own way. This isn't, of course, an exact science and, therefore, every now and then we will engage in what I call the "Dee Dee Myers" effect.

Ms. Myers, who was the Press Secretary for President Bill Clinton said that every now and then, no matter how hard she tried not to, something would slip out of her mouth that she immediately wished she could "reel back in". It's true of any Press Secretary for any President, and it's true of Long Life as well.

So, when reading material in the magazine, rest assured that we are trying hard, as best we can, to provide you good, solid information. Also rest assured that when we do make a mistake, it's because our head, and not our heart, is in the wrong place. At the same time, no matter what article you read (or what magazine you read it in) you still need a little bit of "Caveat Reador" (which I've defined as "Let the reader be cautious!"), in sorting things out. Cryonics is a big, big subject, as well as its related organizations, viewpoints, and pursuits, and it's scientific basis. Even in what one might consider a "hard science", the number of human chromosomes was, until the early 1950's, believed to be 48. In 1956, the number was correctly placed at 46. Red faces predominated at the time all around in the genetics community, I'm sure.

When you see what you think may be a factual mistake, let us know. We'll try to find out if it is indeed the case (differences of opinion are, of course, another matter and folks sometimes have had strongly differing viewpoints on articles in general in the magazine) and we'll try to print a clarification/correction in the magazine. Just keep in mind, however, that any article that is in this, or any other magazine, represents information that could be in error in some way. Wish it weren't so but, alas, it is just that way. Any help you can give through feedback will be greatly appreciated.... Thanks!

Options for Safe, Secure and Legal Asset Preservation for Post-Resuscitation Access

The Seventh Annual *Young Cryonicists* Gathering

Teens & Twenties 7 2016: Getting to Know You - You Getting to Know Each Other

Fri-Sun; April 8-10, '16 Ontario CA Host: *Life Extension Foundation* SCHOLARSHIPS AVAILABLE

★★

Greetings to *Young Cryonicists*,

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

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

Who is Eligible?

Fully signed up young cryonicists from all cryonics organizations in their late teens through age thirty *(18-30) as of April 10, 2016* - may apply to attend.

Younger Cryonicists With Parent(s):

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

Parents/guardians of attendees aged 18-19 are also encouraged to accompany their child. All attending parents will be put in touch with each other should they choose to have their own "get together" during the "young cryonicists" gathering.

Program

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

Enjoy this exciting & fulfilling weekend.

SCHOLARSHIPS:

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

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

Due to cancellations 3 fully funded scholarships have become available. T2 7 2016 begins on April 8-10, 2016. So you will need to apply for these openings immediately. Should it happen that 4 apply we will not deny anyone. We will just add an extra.

Forever,

Cairn Erfreuliche Idun
Founder/Director: T2

PS! Come Early. Stay Late.

A full packet of information with all details and application forms may be found on the Immortalist Society website. Go to www.immortalistsociety.org and look for a navigation button near the top of the home page.

I look forward to getting to know you.

Evidence-Based Cryonics
The Institute for
Evidence-Based Cryonics

www.evidencebasedcryonics.org
Chana Phaedra, Executive Director +1 503 756 0864
Aschwin de Wolf, President +1 503 4325 515
contact@evidencebasedcryonics.org

UK Cryonics and Cryopreservation Research Network

www.cryonics-research.org.uk
João Pedro de Magalhães, Chair
+44 151 7954517
aging@liverpool.ac.uk

Groundbreaking Scientific Results Show that the Proposition of Human Medical Biostasis has Potential and Needs to Be Brought into Mainstream Scientific and Medical Focus

Recently we have seen scientific evidence that long-term memory is not modified by the process of whole organism cryopreservation through vitrification and revival in simple animal models (C. elegans nematode), supplementing knowledge that other small animals with nervous systems can also be healthily revived after storage in storage in liquid nitrogen at a temperature of –196°C (O. jantseanus leech).

Earlier we also knew that in mammalian hippocampal brain slices viability, ultrastructure, and the electrical responsiveness of the neurobiological molecular machinery that elicits long-term potentiation, a mechanism of memory, can be preserved without significant damage following cryopreservation. Published transmission and scanning electron microscopic images from a whole brain cryopreserved through vitrification and also indicate structural integrity.

And now, a new cryobiological and neurobiological technique, aldehyde-stabilized cryopreservation (ASC) provides a strong evidence that brains can be preserved well enough at low temperature for neural connectivity/the connectome to be completely visualized. The connectome is believed to be an important encoding mechanism for memory and personal identity (where the mind lives) within the brain.

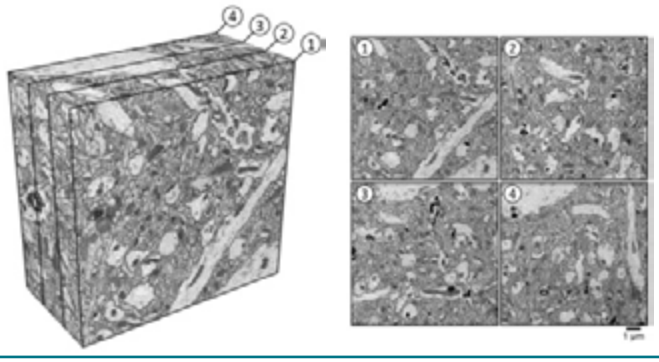
This is a truly groundbreaking result and puts the proposition of human medical biostasis as a way to save humans who otherwise would die squarely within the realm of what may be possible.

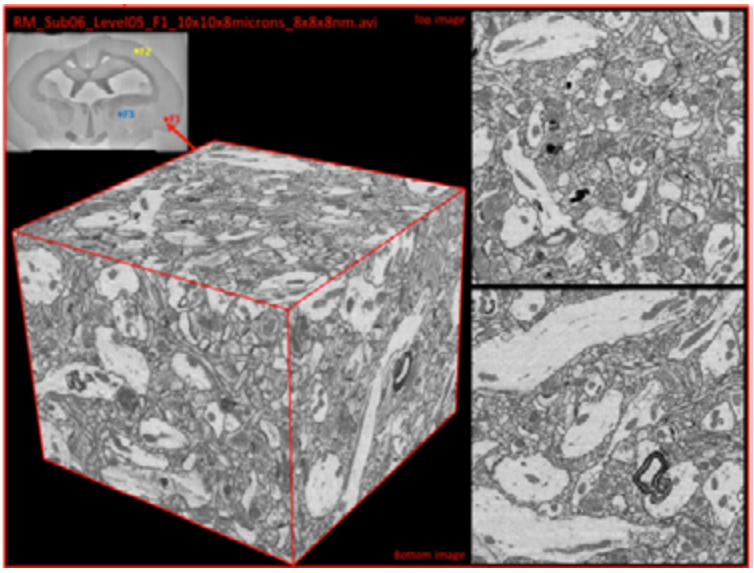
This technology and these results were recently published by Robert McIntyre and Dr. Gregory Fahy in the journal Cryobiology of the Society for Cryobiology. Dr Fahy is the inventor of large tissue vitrification (Cryobiology 21, 407-426 (1984) and Nature 313, 573 -575 (1985)), the Chief Science Officer of organ banking R&D firm, 21st Century Medicine, Inc., and a Fellow of the Society for Cryobiology. Lead scientist Robert McIntyre is a recent MIT graduate and neuroscientist.

First demonstration that long-term structural preservation of an intact mammalian brain is achievable and wins the Brain Preservation Prize

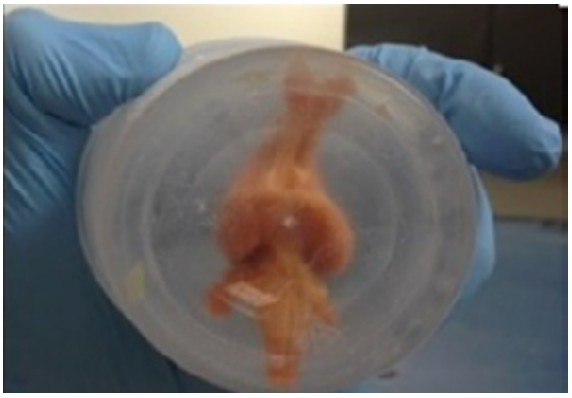
"This result directly answers *what has been the main scientific criticism against cryonics - that it does not provably preserve the delicate synaptic*

Frames from a FIB-SEM stack of rabbit neuropil near the CA1 band of the hippocampus. "Overall structural preservation is excellent: processes are clearly defined and organelles are intact. When observing slices of this volume in sequence, it is easy to track the progression of any process through the stack, demonstrating that connectivity in this region was not impaired by our preservation method (see full video available in online supplemental materials)". "KR8H washout solution. Vitrified; CPA removed by diffusion. Experiment date: 2015-04-15." Source: R.L. McIntyre, G.M. Fahy / Cryobiology 71 (2015).





Left: 3D Electron Microscopic Evaluation. Bottom: Actual whole rabbit brain vitrified and stored at -135 °C prior to slicing for evaluation. Source: The Brain Preservation Foundation.



circuitry of the brain -and sets the stage for renewed interest, research, and debate within the mainstream scientific and medical communities"

- Brain Preservation Foundation a press release

These results come five years after the Brain Preservation Foundation (BPF) launched the Brain Preservation Prize. According to the BPF, 21st Century Medicine narrowly beat a team led by Dr. Shawn Mikula at the Max Planck Institute of Neurobiology, which focused on chemical preservation and plastic embedding without cryopreservation (published last year in Nature Methods).

In addition to the accomplishment and the full "Aldehyde-Stabilized Cryopreservation" protocol recently being published in the journal Cryobiology by 21CM it has also been independently verified by the BPF through extensive electron microscopic examination (link also includes videos). The prize was independently judged by neuroscientists Dr. Sebastian Seung, Professor at Princeton University and Dr. Kenneth Hayworth, President of the BPF.

"Imagine being able save, and at low temperatures, indefinitely preserve people who can no longer be sustained by contemporary medicine so that future medicine can both revive them and restore their health – these results provide strong support of that being possible"

— Dr. JP de Magalhães, ChairThe UK Cryonics and Cryopreservation Research Network

"In the winning of the Brain Preservation Prize, one of the, if not THE, most important scientific results in the history of medical biostasis and cryonics has been accomplished"

— Aschwin de Wolf, President The Institute for Evidence-Based Cryonics

"Every neuron and synapse looks beautifully preserved across the entire brain. Simply amazing given that I held in my hand this very same brain when it was a vitrified glassy solid… This is not your father's cryonics"

— Dr. Kenneth Hayworth, BPF President and Co-Judge of Brain Preservation Prize

What Does This Breakthrough Mean (and NOT Mean) for Cryonics - Our Perspectives

- Aldehyde Stabilized Cryopreservation (ASC) is a proof-of-concept that brains can be preserved well enough at low temperature for neural connectivity (the connectome) to be completely visualized using current technology. The connectome is believed to be an important encoding mechanism for memory and personal identity (sense of self/where the mind lives) within the brain

- This is a truly groundbreaking result and puts the proposition of human medical biostasis as a way to save humans who otherwise would die squarely within the realms of the possible. Medical biostasis now clearly warrants mainstream scientific discussion, evaluation and focus

- The avoidance of freezing damage in ASC is based on vitrification, a technology from mainstream organ banking research that was introduced in cryonics in 2001 by Alcor Life Extension Foundation

- The implementation of ASC that is winning the first Brain Preservation Prize also utilized a blood-brain barrier opening technology first studied for cryonics use by cryobiologist Dr. Yuri

Pichugin at the Cryonics Institute ten years ago

- The idea of ASC (even including specific use of the chemical glutaraldehyde) originated with Dr. Eric Drexler's book Engines of Creation in 1986 under the name "fixation and vitrification" where it was specifically suggested for use in cryonics
- At the same time it is crucial to note that we primarily see this accomplishment as an important stepping stone towards biologically reversible stasis through cryopreservation/vitrification without the destructive nature of fixation and cross-linkages. Such approaches better meet precautionary/conservative principles about ensuring that everything that is needed in order to preserve a human's entire self has actually been preserved.
    - In fact, even though the general idea of ASC has existed since 1986, the field of cryonics has preferred to avoid use of chemical fixation because the resulting chemical changes (the same as embalming) are extreme and difficult to evaluate in the absence of at least residual viability
    - Fixation is also known to increase freezing damage if cryoprotectant penetration is inadequate, further adding to the risk of using fixation under non-ideal conditions that are common in cryonics
    - If future research shows that ASC can indeed preserve enough information to permit computer emulation of animal brains, this will have to be reevaluated
- The first proposed revival method for ASC was actually reversal of chemical cross-links and repair by molecular nanotechnology resulting in revival of a biologically natural human, not mind uploading (see Engines of Creation).
    - Therefore, while the combination of ASC, destructive scanning, and mainstream brain emulation research may provide a route to cryonics revival, ASC is also compatible with revival in natural biological form by using foreseeable molecular nanotechnology . 1

For more color, references and suggestions on scientists to talk with contact:

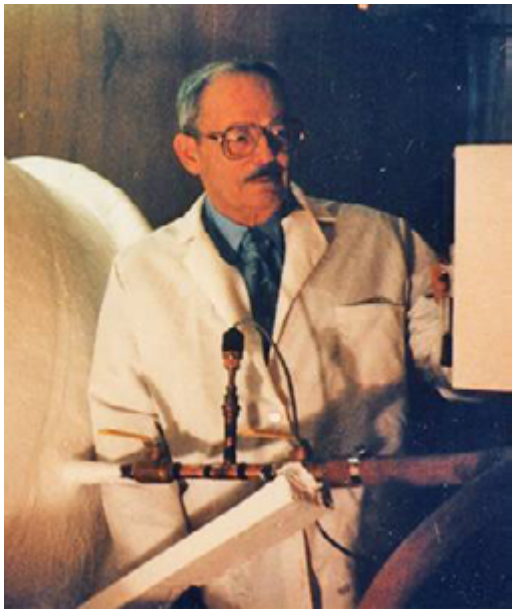
Aschwin de Wolf, President Chana Phaedra, Executive Director Institute for Evidence-Based Cryonics +1 503 432 5515 +1503 756 0864 contact@evidencebasedcryonics.org

Dr. JP de Magalhães, Chair, The UK Cryonics and Cryopreservation Research Network

+44 151 7954517 aging@liverpool.ac.uk

1 Drexler, K. E., "Molecular Engineering: An Approach to the Development of General Capabilities for Molecular Manipulation," Proc. Natl. Acad. Sci.

U.S.A. 78(1981):5275–5278. Ralph C. Merkle, "The Technical Feasibility of Cryonics," Medical Hypotheses 39(1992):6-16. 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.



Robert Ettinger: *The Legacy Continues*

Robert Ettinger and Leonardo da Vinci

Introduction by York W. Porter, President of the Immortalist Society

In my work in health care, I work with a lot of pretty smart folks (present writer excepted). This is fairly natural since the "weeding out" process involved in nursing schools, med schools, and the schools that turn out folks who work in the technical aspects of medical work, tend to eliminate the "weak specimens" that may be among them. Sort of similar to what a friend of mine told me one time. He had gone from attending a small town high school to a regional university and said he was told by the professor in his first biology class about the high withdrawal rate from the class: "It's a demonstration of the biological principle known as 'Adapt or perish'!!". (My friend adapted).

Sometimes, of course, one can be exposed to folks that are "so smart they are dumb". I have one friend whose IQ has to be "out the roof," so to speak. Although he is very smart, intellectually speaking, and is basically a nice guy, he also has fairly poor social skills. Oh well, you can't have it all.

In Robert Ettinger's case, Bob was, frankly, one of the smartest people I ever met. He was, as well, generally speaking, a very kind and well-mannered person and was very nice to me, having me stay in his home numerous times when I drove to the Detroit region for one of the annual joint cryonics meetings held by the Cryonics Institute and the Immortalist Society.

Putting up with my "ten thousand questions" approach to a figure that I initially looked on as an heroic icon during my adolescence before I ever met him and later, with the passage of more than two decades in his regular presence and via correspondence, looked on as just one of my dear friends, had to be trying on him, especially at first, before I learned to somewhat moderate my curiosity.

Still, he was patient and understanding and was one of two people (the other being his second wife, Mae) who were instrumental in me joining the Cryonics Institute as a full-fledged lifetime member, though it took a while to get my funding in place. In this offering from May of 1994, one genius, Robert Ettinger, makes a succinct case for cryonics with interweaving words about another genius from human history, Leonardo da Vinci himself.

Leonardo Would Have Been A Cryonicist

by Robert C.W. Ettinger

The skeptics about cryonics are not only the stupid or the brainwashed. Some now active in cryonics came to it only slowly and reluctantly. others--friendly, or even active in cryonics--remain skeptical and have not made personal arrangements.

One could speculate that some of these people have hidden motives or emotional resistance--even hidden from themselves. But let us refrain from such speculation and take their objections at face value. How can we make the evidence or arguments more convincing?

A PARTIAL ANALOGY

Five hundred years ago the conventional wisdom was that humans (and their works) could not fly. Why not? Because (among the larger animals) only birds can fly. Only birds *have* flown, so only birds *can* fly.

Leonardo da Vinci looked at it differently. Since most birds can fly (and many insects, and a few mammals, and previously a few reptiles), it follows that flight is indeed possible for a heavier-than-air being or contraption. We can imitate nature, or improve on nature, or both; all that is required is a little ingenuity, investment, and patience. (Well, maybe more than a little.)

The conventional wisdom was not totally vacuous. It is indeed difficult for human artifacts to imitate the flight of birds or insects; we still do not have successful ornithopters, and we still do not fully understand the anatomy and physiology of birds and insects. Leonardo's concepts were far in advance of engineering capabilities.

Nevertheless--today our machines fly, and they fly much faster and higher than any bird or insect, even going outside the atmosphere to neighboring planets. We haven't made wings that flap effectively, but we have introduced the propeller (air screw, which Leonardo anticipated) and jet and rocket propulsion, none of which nature ever heard of (unless you count the squid's water jet).

THE PRECEDENT PRINCIPLE & THE CAT PRINCIPLE:

In short, Leonardo relied on the Precedent Principle: Anything that has existed, can exist. (Anything on a human scale; we are not talking about reversing universal entropy.) And--presumptively--there is almost always more than one way to skin a cat. Nature's product, or a similar one, can probably be made by many different methods, not just the one nature happened to blunder onto. (See e.g. our April issue, p. 46, on substitutes for DNA.)

WHAT NATURE HATH WROUGHT

The skeptics object that the cryonics repair job--reversing the damage done by present freezing methods, as well as the other previous damage--is hopelessly difficult. (Anatole Dolinoff e.g. has worked up numbers of atoms and molecules to move around or repair; see elsewhere in this issue.)

But let's get a little perspective. Nature can build a person from a blueprint in nine months. Presumably, repairing one in similar time ought not to be too great a challenge--once our molecular engineering skills equal and surpass those of nature.

To be sure, in some ways a construction job can be easier than a repair job. But in biology the line between construction and repair is very blurred, if it exists at all. Whether your body is growing new skin to heal a scrape, or is growing new skin to keep your growing body covered, essentially *the same mechanisms are at work*.

In each case--to oversimplify a bit--little machines (enzymes, ribosomes, etc.) are following instructions laid down in genes and transmitted by messenger RNA to the work site. Generation, regeneration, and repair are all closely related.

THE LANGUAGE PROBLEM

For some people, part of the conceptual difficulty may lie just in the words "nature" vs. "machine". But nature uses machines. The tiny components of our bodies--including the mechanisms of growth and repair--are machines. And Old Ma has no monopoly on the invention and use of machines.

NATURE LOVERS?

Once more: Although the achievements of nature, through evolution, are marvelous and still not completely understood, they are not necessarily the best nor the last. It took humans to invent the wheel; this does not exist in nature--nor does the steam engine, the rocket engine, useful nuclear energy, aluminum building materials, the electronic computer, nor a host of other things.

Further, nature is painfully slow. It took hundres of millions of years to produce mammals. We and our computers can work faster by many orders of magnitude.

Further, nature is a blind blunderer. Evolution proceeds by a series of catastrophic accidents, inflicting unspeakable suffering, and finally destroying all individuals and almost all species. Can we do better? We could hardly do worse.

REMEMBER LEONARDO

We should never underestimate the possible difficulty of particular undertakings. When I was a boy, in about 1930, a Sunday supplement in the *Detroit Times* (a Hearst newspaper, now long defunct) ran a big article on the probably inventions of the next fifty years.

Nuclear energy and computers and even antibiotics (already invented!) were not mentioned, but a big play was given to the Flying Flivver.

The Flying Flivver was to be a family helicopter, easy and safe and cheap enough for anyone to buy and fly. It didn't come in 1980, and it still hasn't come. So we can't be too credulous.

Leonardo da Vinci was also ahead of his time. But it's as least as bad to be too negative. **Effort doesn't assure success, but lack of effort assures failure.**

Leonardo understood this--and if he were among us now, he would surely be a cryonicist.

Joe Kowasky - *continues from page 9*

Perhaps future technology will say What? Cancer? That is an easy fix! Thank you for keeping the person in stasis until we could fix it. And we know it works.

20 years ago, an article in the New York Times talked about how we need to keep patients a few degrees warmer during surgery than was standard to ensure better results. (They did note that lower temperature was a necessity for heart surgery but they didn't quite put the pieces together.) Today low temperature surgery is being pioneered in Pennsylvania and at Harvard Medical School as an amazing improvement over surgery with the body at normal temperature. Here is a headline from the British newspaper the Telegraph:

"Patients To Be Frozen Into State Of Suspended Animation For Surgery!"

With the subcaption reading:

"Patients are to be placed into a state of suspended animation when they undergo surgery by using a ground breaking technique that freezes their bodies to the point of death."

A recent article in Scientific American described experiments with nematodes that showed that they could be frozen without loss of memory. We have seen people underwater –- in cold water -- for 40 minutes come out with no brain damage. Last year a man was found in the snow in Pennsylvania. He was non-responsive, he was not breathing and his heart was not beating.

The coroner was called in and estimated that the man had been in -4 degrees (Farenheit) with no vital signs for 12 hours. But to the paramedics' great surprise a doctor at Lehigh hospital ordered CPR. And, after weeks of recovery, this man woke up and went home, minus fingers and toes, but alive. 12 hours! The headline in the Washington Post read:

"Being frozen 'to death' saved this man's life. It could save others' too"

What a huge step forward in understanding and acceptance of reality. Frequently when there is a choice between reality and what is in our heads, what is in our heads win.

It takes a lot for reality to overcome the inertia in our own minds. And here we see that it has, which is very nice. Now this was a very short period of time, 12 hours, and the man's body did not get below 65 degrees Farenheit But. . .the wood frog and the wooly bear caterpillar actually freeze solid over the winter - the heart, lungs and brain stop entirely – and then they revive in the spring. And everything starts working again, all by itself.

And most recently the journal Cryobiology reported the successful revival of tardigrades. Little creatures, often known as "water bears", little guys, cute little guys--they were revived after being frozen for 30 years---30 years!. They lived and even reproduced. If nature does this – and it does!-- we think it likely that we will be successful as well.

You can't fly a heavier than air object, that's crazy!...until you copy the birds, which have done it forever.

"You can't run a mile in under 4 minutes, the human body just can't!" All of the experts knew this! Until Roger Bannister decided in 1954 that he could...

Recently I was asked to attend a Cryonicist Conference for those in their teens and 20s –- and here I should thank Bill Faloon for his sponsorship of this very important conference as well as for the many other efforts he supports in cryonics and life extension---I was asked to attend a Cryonicist Conference for those in their teens and 20s no longer as a teen but rather as an elder statesman! Not a tremendously comfortable feeling, but it reminded me that Robert Ettinger the father of cryonics, found himself in a similar situation. In his twenties, during WWII, he was badly injured and was in the hospital for many

Robert Ettinger - the founder of Cryonics

months. During that time he reflected on some things that he read and presumed that cryonics would be going full swing by the time he was old enough to need it. As he hit his thirties and forties, and nothing was happening he had what I think of as an "OH CRAP" moment. He realized that he would have to do it himself.

And so he did and it began. And we have developed into a strong organization. But until these ideas are commonplace, we will not have succeeded. I mentioned earlier that the Cryonics Institute was founded by Robert Ettinger

Robert Ettinger---anyone who knew this visionary, as I did, also knows that he was brilliant, kind, giving . . . and a curmudgeon. He was a pragmatic scientist with no interest in, or patience for, glitz or glamour. His message appealed to US, but not to the bigger audience – just like most people do not read a scientific journal. He had a saying which I really liked: Often mistaken; never in doubt. I don't know if it relates to this talk but he would and did on several occasions change his position if shown to be in error, however, and he would always move forward.

To appeal to a larger audience, we regularly meet with the media from around the world. There have been articles and news stories about cryonics and the Cryonics Institute in the media of several European, Asian, North American and South American countries as well as in Australia, and CI has been featured in several documentary or other films. But what do we say? Is it something that people will hear?

One thing we neither say nor believe is that we are trying to raise the dead. One of our members "died" in a shopping center parking lot some 18 years ago. He was revived with a defibrillator they had at the store and lived until 2014. Had this happened to him even five years earlier the store would not have had a defibrilator and this story would likely have had a different ending. Although I said that he "died" in the parking lot, we know today that he was not really dead yet. His body had a catastrophic failure . . . but it was not irrepairable. We were able to reboot him. This is the message we trying to get across--We are ignorant. We do not know when someone is truly dead. When someone's heart stops, when disease damages the body beyond what we can now repair, when illness overtakes our medical skills and a person lies silently on the bed the person may be screaming to us in silence "I'm not dead yet!" I think - and now I speak for myself only - that it is an affront to God to pronounce and declare that without question that person has died. We have seen too much in the past 40 years of organ transplants, heart bypass surgery and defibrilators to have the hubris to say that. And so we do what we can.

But what about the rest of the world that doesn't see it that way?

Has anyone here heard of the internet? Why? I think that it is because the world wide web has a lot of stuff on it! How about some examples of that stuff:

Cartoons, college classes, financial information, conspiracy theories, news, pornography, family histories, TV shows, numismatic information, . . . OK, so who here has in the past 5 years used the internet to access all of those things

Nobody. Or at least very few. Why? Because we have different interests. I was an economics major. I find discussions about the elasticity of demand fascinating! How many people even know what that means? Language can itself feel threatening to people even if the topic of discussion might interest them. They might want to discuss ways to try to restore a sick person to health but would never want to discuss freezing a corpse.

I often feel like saying to people who refuse to consider cryonics, you stupid person, why the heck will you take a pill from your doctor that has potential side effects of causing sterility or even death without a question! But you will not even consider cryonics! (Now, I am not telling people to stop taking their meds, by the way – just commenting on the blind acceptance of some things and the blind rejection of others.)

I was going to joke about side effects like your legs falling off and your eyes melting, but my friend reminded me that true side effects are even worse! –But if I talk with people in that way – or worse yet, dismiss them without talking with them at all – what would I achieve? Nothing!

Religious groups have learned over the years to talk to people about things that interest their audience. The Jehovah's Witnesses offer a very good example. They found that people often don't want to discuss God or religion – "Hey, wanna spend a few hours discussing God and what you need to do?" Yeah, maybe not.

But people do want to discuss their relationships, fear of death, the world at large, crime, etc. So they offer in depth, well written, easy to read articles on these topics, and show how their religious beliefs relate to that. Attitudes Make a Difference, Making Peace at Home, A Visit to Lichtenstein, The Color Changing Ability of the Cuttlefish and How Scientists Are Trying to Use This in Our Clothing. Now you have things that cover your topic, appeal to a variety of interests, and which people want to hear.

And be positive -- Terrorists may use glycerin to make bombs; a homemaker to make jelly treats. Gaza example – they could use materials to build bomb shelters instead they use them to build tunnels to attack. In 1951 the new head of the Lubavitch Jewish sect known as Lubavitcher Rebbi in his first talk – when the knowledge of the Holocaust was just becoming widely known – a time when it would have been easy and understandable to talk about the jungle we live in, the terribleness of the world, anger, hatred, negativity. His first talk was about how we live in a garden my beloved (Song of Songs). Not an easy thing, but what you need to do if you are a true leader. He believed that our job is to make the world a better place. And so do we

So, what do we learn: use language that people understand and are comfortable with. Discuss things with people that they want to discuss. Be positive. Talk to everyone. That said it is easier to talk to people who have open minds. Who are those people?

I heard a comment from someone running the Google science fair. She said 14 year olds are too young to know that things cannot be done so they do them. It is important to make presentations in schools. Or invite them to you. High school science classes come in to the CI facility with their teachers for a two hour seminar on cryonics. (And we even make liquid nitrogen ice cream with them!) But– and this is a key so I will repeat it-- talk with EVERYBODY! Truly successful people have generally gotten there by getting up every time they got knocked down and continuing to move forward. The Mormons, for example, have a huge growth rate in part because they talk with everyone. (Stay home on a Saturday morning and you will see what I mean.)

Attitudes both follow and lead the future. Cryonics has become fairly accepted – for you but not for me. So I was thinking to myself a few years ago what can we do that would be more acceptable to the public yet also tangentially benefit cryonics and move it forward?

Virtually everyone today supports organ transplants. Most know someone who has needed, or donated, an organ. But nearly 70% of some donated organs go to waste due to the speed required for transplants. The medical community is working on three methods to deal with this: growing organs from scratch, keeping organs alive with nutrients during transport -- this is being tested with some good results specifically with livers today-- and the freezing of organs. Through a project unaffiliated with the Cryonics Institute I am working to encourage research into freezing of organs. With another goal of getting ordinary people involved.

(At this point, Joe showed a video about the Immortalist Society Cryoprize..You can see it at : https://www.youtube.com/watch?v=ipwwr9xlOhI and you may read more about the Cryoprize at www.immortalistsociety.org/organcryopreservationprize for more info).

You can tell that that is me because I am wearing the same suit! A few months ago I met with gentleman by the name of Evan Breen. Among people in their teens and twenties, this young man is a well known producer of 6 second humorous videos on the medium Vine. He has over 1.1 million followers. He is 23 years old. And he did his own video about the Cryoprize!

This is not the most polished or scientific presentation … but it is being watched by 18-25 year olds. How many of us thought about our own mortality at that age? I did … but most people don't. Here is the video that he put out and which was watched by over 1500 people in the first 2 days.

(Evan's video may be seen at: https://www.youtube.com/watch?v=rilrZz1eito).

There are other groups and other things being done on this front: I have read about the Organ Preservation Alliance [Sebastian Giwa] which has a strong team of scientists, physicians and entrepreneurs with training from Harvard, MIT, Stanford, etc. The X-prize Foundation – which has given prizes that encouraged the development of such things as the first private reusable manned rocket to go to space and land safely back on earth – is also considering offering a prize for the freezing and revival of organs for transplant purposes And, last year, the United States Department of Defense allocated $60 million toward research into freezing of organs for transplant. . . .and they recently added another $11 million to this venture. I am thrilled.

For good and understandable reasons, organ transplants are something that people at large jump to support. Perhaps because, as I mentioned, virtually everyone knows someone who received, needs, or is an organ donor. When I started the Cryoprize project, my friend Dena said to me that she has heard me talk about cryonics for 30 years and never had much interest. But THIS, -- the Cryoprize making organ transplants safer, less costly and more available --this is something that is really important! " This is a stepping stone – perhaps a NECESSARY stepping stone, to cryonics. And the public supports it. Yay!

Let's look to the future for a minute. Longer life has already, and likely will further, affect relationships, what we think about working in a field.– I want to be a blimp pilot and I would also like to be a chef, for example. Physical changes might give me the fingers to be a better guitarist. We might easily change our gender or skin color. More interrelationships via a brain connected to others leads to an intuitive feel of others subcultures and, I hope, greater acceptance – as we have seen already to some extent as our cultures have become more interconnected via the media and communication advances

Like odors & smells, dialect and language can have a great effect on us. Far more than race or skin color, I believe, or educational differences, the way people speak can be endearing to those who grew up with similar spoken attributes and grating to those who did not. And it is largely subliminal – like a sound which can annoy us even if it is too high pitched to be consciously heard. Once we can share each others' memories – will this change? I hope so.

We will be able to use these techniques as today we drive a car or use a computer without necessarily understanding its underlying workings. So we will become more able to do things but perhaps less knowledgeable individually. And the question remains, if we change ourselves so much, will it mean a change in our societal and moral norms? If I change my body to that of a bumble bee, what then? How will I interact with others . . . We don't know.

Cryonics, organ repair, organ transplant, organ replacement are a few ways that we are working towards repair of physical body structures and extending lifespan so that we can achieve more of our potential, whatever that may be.

A physicist, a chemist and an economist were stuck on an island and they had cans of food, and they were starving and they were trying to figure out how to get into these cans of food. The physicist says, "Well, there's a rock. We'll hit the can, the can will split open, then we'll be able to eat the food."The chemist says, "Wait, I have an easier method. We spent hours starting that fire over there...let's just stick the can in the fire, the pressure will build up, the can will explode, then we can eat the food!" The economist says "Gee, you guys are making it so tough! Why don't we just presume we have a can opener!"

Well, my undergraduate degree, as I mentioned, is in economics. Economists create models to try to predict the future. And one of the biggest things economists have learned is that as complex as those models get, we almost always miss something. And in general, not just in economics, projection of the future has been notoriously difficult and frequently wrong. Maybe this will change with AI, but not with most of my projections. We think it likely that changes we will see in the next 100 years - and to which cryonicists look forward are the repairing of damage to our bodies, changing of the physical structure of our bodies - for example as a means of colonizing a planet, and modifying our brain and/or interfacing with external sources.

I do not want to go into any detail because I have no clue as to how this might actually happen. For example, will artificial intelligence want to interface with us? We don't know. Elon Musk is very concerned about the unintended potential dangers of A.I. Ray Kurzweil, not so much. But both agree that the changes will be dramatic and beyond what we can contemplate. Just as today's internet was not a glint in your grandparents' eyes, to mix metaphors.

Rather than trying to make projections, then, what I would like to discuss is how we might do these things. Nanotechnology is way up there and already in use. Machines the size of molecules can be used to manipulate and reorganize our cells. Gene therapy/manipulation is what we might think of as a more organic, biological or chemical method for doing similar things with nano-machines that we do not build from scratch but which nature already provides us. And finally, with the help of artificial intelligence--and that keeps popping up because it will be a biggie! -- we may yet learn of methods beyond what we can today fathom or guess

Two people were talking – one said the internet is not a superhighway as people say it is. The other said, yes it is – but it is night-time, there are no streetlights and the exit signs are unmarked. My excitement about AI is how it might help me not just find information, but organize, compare, and test the vast amount of information that is out there, a lot of it bogus, and potentially do it all in my head, so to speak

Changes in societal norms are already allowing us to move more quickly in this direction. We see nanotechnology in use. We see cloned animals. We see bloodless surgery. Frozen sperm, eggs, and embryos. Targeted drug therapy. Organ transplants. Dialysis. And as of very recently, the huge benefit of – and advances in the science of – low temperature surgery. People are more apt today to raise ethical questions about the type of manipulation I mentioned above – and that is very important – than to raise questions about whether it will be possible. For example, there is a running dispute in the life extension community as to whether a copy of a person's memories – if identically copied – perhaps even a physical reproduction of the brain itself – is the same person or a "twin" with the same memories. I am in the camp that it is a copy.

However, what about a transporter that we see in science fiction that converts a person's material parts to energy for transmission, reconverts it into matter. Is that the same person or a different person? Scientists recently accomplished this feat--albeit with very small particles instead of part of a human or with visible structures--so this is not just a thought problem.

And as we physically change ourselves – and physically includes the brain – will our morals change? History indicates that roles of good and bad and all in between remain, no matter how much our technology, our wealth, our habitat, our knowledge, grows or changes. I was recently in Pompeii and it amazed me that while our technology has changed, people really haven´t. My wife commented that to this day people do not treasure life. Killing is easy. Keeping people alive, much more difficult. I say to the terrorists – find a cure for cancer and they would get whatever they were asking for! It's hard to do, killing is much more easy.

Inside people haven't changed. But when we can change our bodies and minds, will that be different? If we decide to change our body to that of a bumble bee will that affect us intrinsically?

Will there be a wealthy and powerful class that controls and manipulates a lower class? Or will easy access to knowledge create more egalitarianism? One of the premises of the Cryonics Institute is that cryonics is coming and we had better develop it before the bad guys do! That is also why we keep our prices so low. We want to share this with a cross section of society – not just out of altruism but to ensure our own future in what we would consider a healthy (diverse) society.

There are always a few visionaries and eventually their vision often comes to fruition. Sometimes, though, the visionary is tortured to death in an inquisition or dies a pauper (like Nicola Tesla). Not so great. There have been changes in societal acceptance but not enough. Cryonics has a tough time because of this. Here is an example of the circle that we need to break into to make this happen– this is something that was discussed by Dr. Aubrey de Grey at a conference that I went to.

Government won't grant funding to certain things. It will only grant funding to certain types of research. The people that do research, cryobiological societies and other scientists, they want funding. So they say "We're not going to do research into cryonics. That stuff doesn't work. We don't want any of that. We want nothing to do with that. We want...we want your money". But, what they say to the government is "We're going to do research into things that really matter...the things that you say matter". So they get the money. And so they say "Yeah, cryonics won't work". And then they say that to the science pundits that appear on TV...the talking heads that appear on TV. And the talking heads on TV say it to the public. They hear it from the original research scientists, "Cryonics won't work...it's not gonna work....we're not going to do research on that." And the talking heads tell the public "Oh this stuff doesn't work...we should stay away from it". And what does the public do? The public goes to their elected officials and they say, "Hey, you know when you're giving grants for research, make sure you don't do that cryonics stuff because we know that doesn't work. We heard it on TV". And so it's this big circle, and it's very difficult to break into.

But if we can start with something that is acceptable to society– such as organ freezing for transplant, which is an extremely good thing to do on its own right – we get a free pass into the circle. The Federal Government happily gives $60 million, now $71 million, to that cause. We can save more lives with organ transplants – it is important in its own right. And we can hasten the development of cryonics (and save more lives still), and maybe not go through that nasty torture or pauper stuff. (It's a win-win-win!)

In the 1970s, it was predicted that we would soon have video phones and flying cars. Almost 50 years later we finally have video phones. So much of what we predict never comes to pass. But what we DO today – it happens. Those of us speaking at the Futurist Conference I mentioned earlier, were trying to make some predictions to help the business leaders in the room plan for the future. And that is important. But since most people are followers, those of us who are here, and others who try to do something – will have MORE IMPACT on what does occur than we might expect. Especially if we can indeed lead others.

Which is why I focus on what we need to do today to bring about what we want tomorrow rather than just guessing what might be coming tomorrow. Cryonics is about doing things today to try to bring us to tomorrow, whatever it is. Because if we are not here, all of our projections don't matter. But in promoting and developing cryonics we are affecting the future. As we lengthen life and repair people, cryonics will likely be used less. But there will likely always be accidents so it may continue to be used for emergency situations. If we move to a virtual existence, well, who knows. We may abandon the need to preserve the body. I have a belief that there is more to us than neurons but that is my own belief and bias.

So, what can we do?

Organ freezing for storage (banking) and transport

Whole body freezing (cryonics)

We know these things work in nature. It is up to us to copy that process for human beings.

And now as Brent Spiner at a Star Trek convention- enough about me, ask me some questions!

In the next issue of Long Life, Joe gives replies to some excellent audience questions and makes a few more final points----Don't miss it!

Final Thoughts

York W. Porter - Executive Editor

Dr. Bliss and Mr. Garfield

"Mr. Garfield's been shot down, shot down, shot down, Mr. Garfield's been shot down, whoa"

Immediately above are the beginning lines of an old song about the assassination of President James A. Garfield. On July 2, 1881, a mentally ill and unsuccessful office/government job seeker by the name of Charles Guiteau, opened fire on Garfield at a railroad station in Washington, D.C. In those days, unlike today, Presidents were, with the exception of Abraham Lincoln during the Civil War, not under the layers and layers of protection we have today since this was considered to be too much like the prerogative of kings. President Garfield was simply in the presence of his two sons and, unlikely though it may seem, also in the presence of Robert Todd Lincoln, former President Lincoln's son, who had come to see Mr. Garfield off as a friend and as a member of Mr. Garfield's cabinet. Robert Todd Lincoln would have, ultimately, the unlikely and sad distinction of having been directly or indirectly at each of three President's assassinations as, 20 years later, he was also in Buffalo, NY (although not an eyewitness) when President James McKinley was also shot. McKinley died eight days later.

Guiteau had a long and sordid history. His family had him committed to a mental institution in 1875 but he escaped. Previous to his assassination attempt on Garfield, he had tried various occupations without success, including the practice of law, bill collecting, and theology. He had even spent time in what was then considered an attempt at a Utopian community in Oneida, New York. Following these endeavors, he had turned to politics and wrote a speech in favor of Ulysses S. Grant for an additional term as President since, in those days, the "two-term limit" for Presidents was tradition but not law.

When Grant lost the Republican nomination to Garfield, Guiteau altered his pre-written speech somewhat and changed it to favor Garfield. He never gave the speech in public but had several copies printed up and distributed. Even though Guiteau's speech left much to be desired, nevertheless he felt, as sometimes happens with a basically deranged person, that he deserved much of the credit for Garfield's ultimate success in what was a narrow election victory. Guiteau thought he should be rewarded for his "efforts" by the awarding to him by the Garfield Administration some sort of a government post. These were the days when government patronage made the present day widespread availability of "pork" seem like an amateur sport.

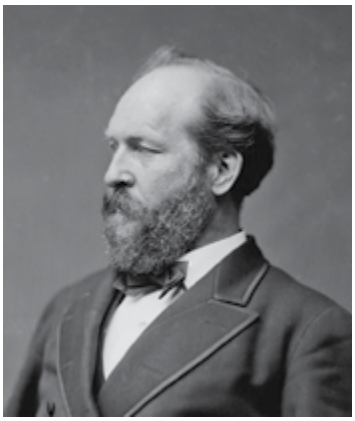
Guiteau made numerous trips to various governmental officials, seeking a relatively minor post or perhaps even an ambassadorship or some such higher office. He was even able, in the days when the White House was literally open to anyone, to actually see the President himself. (Garfield, according to one report, often times saw 100 "favor seekers" per day). Foiled in all those attempts at a government position, Guiteau became convinced that God had told him to take Garfield's life. Convinced of the righteousness of his cause, he even bought an expensive pistol, which he "knew" would be placed in a position of honor in a museum and, on the day of the shooting, Guiteau had his shoes shined to a high gloss due to the "glory" he knew would come.

On the day of the shooting, one bullet passed through Garfield's shoulder. Another passed through his spinal column but missed the spinal cord and lodged near his pancreas. Collapsing to the floor, Garfield was ultimately carried back to the White House. Initially believed to be mortally wounded, Garfield survived for many, many days. It was at the beginning, however, that the die might have been cast for the worse. Robert Lincoln, with all the good intentions in the world, sent for Dr. D. Willard Bliss. The combination of Dr. Bliss' strong-willed approach, coupled with medical ignorance of the time, may not have caused, but certainly helped lead, to Garfield's ultimate demise. As a radiologist that this author talked with one time stated, "It's sad to say but a patient will believe just about anything a doctor tells him just because the doctor is a doctor, no matter how wrong the doctor may be."

And Dr. Bliss, as well as his colleagues, was definitely wrong in some ways. The wounds suffered by President Garfield were probed repeatedly under unsanitary conditions by unclean fingers and unsterilized instruments since the germ theory had not yet taken hold universally. Though Lister had introduced the concept in the early

1860's, even the most indigent patient in the smallest hospital in the USA today would receive far superior medical treatment, infection wise, than did one of the most prominent men on the face of the Earth, back in the late 1800's. In that day, many medical men clung to the theory of "miasma", which is the thought that disease could be caused by "bad air". The word "malaria" stems from this thinking, that bad air ("mal-aria") was the root of the problem. Things had a long way to go in the scientific underpinnings of medical treatment.

Another problem was one of long standing in many medical professionals. The nature of the work is such that errors are costly in human suffering and lives and many medical professionals are, of necessity, very perfectionistic and hard driving in their work. Traditions tend to "die hard" in the field and innovative thought is, to some degree understandably, looked at with great skepticism since, if the innovative thought is wrong, as it can often be, great havoc can be wrought that can't be easily, if ever, fixed. Good ideas have to fight their way to the surface and there is the compounding factor that just because a thought is innovative, that doesn't make it correct.



James Garfield (L) and Dr. D Willard Bliss (R) - Wikimedia Commons

And, there is the problem of folks who just think they are absolutely right and just can't be wrong, no matter what. These types of folks are in all walks of life and not just in medicine. In many areas, they do minimal harm, such as the car mechanic who is only hurting his own business if he keeps following an ancient, but outdated, path of repair in which he has supreme, but mistaken confidence. In some areas, such as flying a plane or working on seriously ill and/or injured human beings, however, such "over-confidence" can easily result in death. It appears Dr. D. Willard Bliss may have been one of those folks in a profession where confidence but not certainty is what's needed instead.

One such form of "I can't be wrong" may have come from the fact that Bliss had served as a surgeon in the Civil War. The bullet wounds in the war were numerous and, in many cases, quite horrendous. Many physicians, even in modern day practice, are not exposed to the number and kind of wounds that Dr. Bliss could have seen during his service in the Union army. This frequently leads to a type of the "appeal to authority" fallacy in which it isn't recognized that any authoritative opinion is only composed of statements that are *probably true* instead of no doubt and absolutely true.

Also, rather than back up their conclusion with the general reasoning why they think their opinion is correct, such folks tend to, unfortunately, back up their argument with such statements as "Where did you get your mechanical engineering, law, medical, etc., etc. degree?" rather than go through the steps of reasoning, including probabilistic statements, that leads them to their conclusion. In Bliss' case, even with other doctors, it could have led to the "How many bullet wounds have you seen?" rather than try to defend the particulars of an opinion and reasonably listen to contravening opinions. In a modern day example of this fallacy, many an airline crew has, sadly, flown a perfectly good airplane right into the ground (so-called "controlled flight into terrain") and any comment questioning their actions beforehand by any folks without a pilots license could have easily been met by "How many flight hours do you have on your license?" just before the stark "Sound of impact" line which ends many a flight data recorder transcript would have appeared.

In Bliss' case, his vast experience with bullet wounds which left him, nevertheless, far from infallible, coupled with his apparent professional and personal pride did lead him to be unable to cede, or even share, authority with other doctors. Further, he had already publicly stated that the bullet that remained in President's Garfield's body was on the right side, Again, pride and an inability to apparently admit even the possibility of error wound up with him forbidding the noted inventor, Alexander Graham Bell, from using an early form of a metal detector on the opposite side. Bliss just couldn't be wrong. Alas, the autopsy conclusively proved he was. (Didn't stop him from submitting a medical bill that, in modern day money, was over six hundred thousand dollars).

Those of us in cryonics have deep respect for expert opinion. We use it in our arguments in favor of this world-changing concept and we try hard, albeit imperfectly I'm sure, to be as accurate as we can in its use. We don't ask you to "check your reasoning power at the door" when exploring this life-saving concept. We do ask you to just give us a fair hearing in which you carefully weigh the argument, pro and con, about this remarkable idea. Like many of us before you (including, frankly, physicians and scientists of various backgrounds), we think, and we hope and believe that, unlike Dr. Bliss, if you'll keep an open and "amenable to reason" and prudently skeptical mind, you'll find our position to be, at bottom, quite rational and solidly based. Once you've reached that conclusion, we want you to join us and want you to do so as soon as you can! You'll be glad you did!

Get the world's premier publication on prolonging youth & longevity for **one year absolutely FREE!**

605.82 1215

Packed with the latest medical findings, research results, and innovative treatment protocols, *Life Extension* Magazine® is the ultimate resource on staying healthy and living longer. Subscribe now and get a one year subscription (12 issues) absolutely **FREE** ... that's a whopping **$59.88 off** the newsstand price! And it's brought to you by *the* global leader in the field of preventing age-related disease for over 35 years.

PROD CODE: SUBCOMP

Stay healthy with the highest-quality supplements money can buy.

Life Extension® is the only supplement brand solely dedicated to helping you live a longer, healthier life. Our premium-quality products are based on the latest clinical studies — made with pure, potent ingredients at the same clinically validated dosages used in those studies. Your body deserves the best. Insist on Life Extension.

Don't just guess what your body needs.

Our expert team of Health Advisors can answer your health-related questions every day of the year. And they'll gladly create a regimen of nutritional supplements, diet, and exercise that's customized for your needs.

Get more with Your Healthy Rewards.

With our *new* FREE rewards program you earn valuable LE Dollars back on every purchase you make.* No membership required. For details visit **www.LifeExtension.com/Rewards**.

Subscribe to *Life Extension* Magazine® for FREE today!

Call toll-free 1-866-491-4993 to speak to a live operator • www.LifeExtension.com/LongLife

You must mention Discount Code AVM525A to get these savings. • Offer expires 1/31/16

LifeExtension® | LE YOUR HEALTHY REWARDS

*You earn LE Dollars on all your Life Extension purchases (except shipping fees, CHOICE and *Premier* program fees, *Life Extension* Magazine® subscriptions, or any purchases made with LE Dollars or gift card). Redeem LE Dollars for any purchase such as products, labs, sale items, and shipping fees at the rate of 1 LE Dollar being equal to $1 U.S. dollar at checkout. LE Dollars may not be redeemed for *Premier* program fees, CHOICE program fees, *Life Extension* Magazine® subscriptions, or to purchase gift cards. LE Dollars have no cash value and are not redeemable for cash, transferable, or assignable for any reason. Please allow 4-6 weeks for delivery of your first issue.