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LONG LIFE

Longevity Through Technology

Volume 49 - Number 03

2017 ELECTIONS

CRYONICS INSTITUTE
Technology for Life

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

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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

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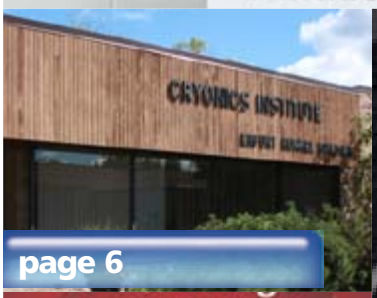

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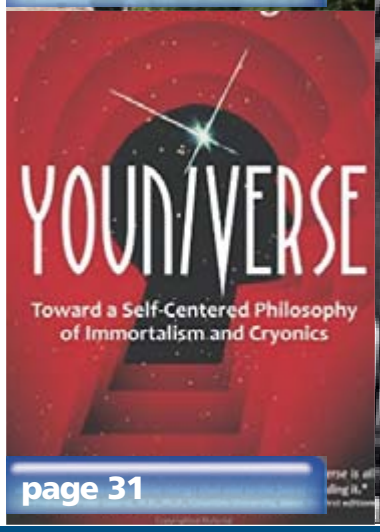

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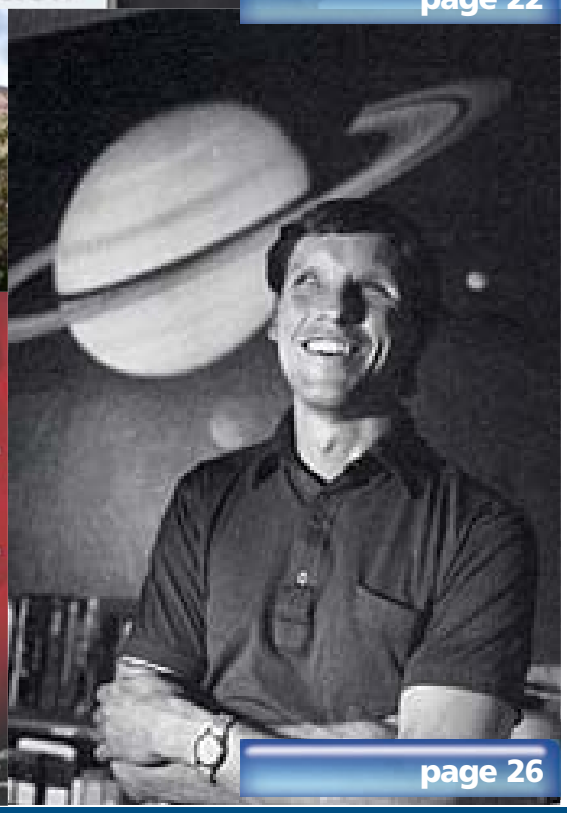

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LONG LIFE
MAGAZINE

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
Director-at-Large: Stephan Beauregard

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Come One, Come All!!!

York W. Porter
President - Immortalist Society

This month's edition of Long Life Magazine will not contain a submission by the President of the Cryonics Institute. Dennis Kowalski, the current CI President, is running for re-election to the Cryonics Institute Board of Directors and it has been the policy for several years now that anyone standing for election may not write more than any other candidate in the pages of this magazine in the issue immediately preceding the election. Whoever is elected by the CI Board of Directors to serve as the President of the Cryonics Institute will be submitting information to the next issue of Long Life. (The CI Board of Directors is set up so that four members out of the twelve stand for election each year and, after the election, the Board then meets and determines the officers of CI for the next year).

So, in the absence of a report from the CI Executive, I'm filling in instead. I thought about writing several things but I settled on something that was influential for me and something I think will be influential for readers and that is the subject of simply having you attend the annual meetings of the Cryonics Institute and the Immortalist Society. This year they will be held on Sunday, September 10, 2017. The meetings begin at 3 p.m. and normally take a couple to three hours There will be tours of the CI facility from noon to 2 pm on that day.

When I first became interested in cryonics, I was a teenager growing up in the hills of Virginia. After being aware of the general idea for a while, I finally came across Robert Ettinger's seminal work *The Prospect of Immortality* on a discount rack in a department store my family used to frequent way back in the 1960's. Costing all of a dollar, which in my early teens I had to beg from my Dad, I took my treasure home where I had the experience of a "light bulb being switched on". For years after I somewhat haunted the public library in those "pre-Internet" days and looked avidly at newsstands for any information on this intriguing and exciting subject. Down through the years, I collected print copies of any articles and magazines that contained any information I could find on cryonics. In my college days, I looked forward each month to the words that came from the Detroit, Michigan area through what was then a monthly newsletter. Still, I was the only cryonicist I knew of and years went by with that being the fact.

Finally, I received a notice about the annual meetings. I had received them before but, for some reason, this request for attendance appealed to me in the particular. I decided to make the 500 mile road trek to Michigan and I'm very, very glad that I did. Held at the lovely home of David and Connie Ettinger, the son and daughter-in-law of Robert Ettinger, I had a wonderful time listening to folks whose names were only known to me by print. Robert Ettinger was one of the smartest and most decent persons I've ever met and I came to frequently stay in his home and to consider him a mentor and a friend. This trip solidified my interest in cryonics and I've only missed one of these annual events (due to car trouble on the road while trying to get there) in roughly the past 30 years.

I think you'll find a similar experience for yourself if you'll take the time to attend these "open to the public" meetings. You'll get to meet folks you have only read about, have a chance to view a real and working cryonics facility and you'll get to meet folks that basically think like you do, that life is a precious gift and that one should take every reasonable measure to try to extend it. Cryonics is certainly the ultimate one of those.

As mentioned before, the meetings this year will be held at the Concorde Inn Hotel and Conference Center. This facility is located at 44315 North Gratiot Avenue, Clinton Township, Michigan, USA. (The zip code for land mail is 48036). The main telephone number is 586.493.7300. You can go online to the website of www.concordeinns.com and view a lot more information and can also fill out a contact form. This facility has plenty of public areas for socializing after the meetings and a number of excellent restaurants are nearby for folks to choose from.

As an additional attraction, a dinner and social gathering will be on Saturday, September 9, 2017 (the night before the annual meetings) at Sajo's Restaurant, 36470 Moravian, Clinton Township, Michigan. Please note that everyone is responsible for his or her own bill at the restaurant. You can go to www.sajos.net for more information about the restaurant.

Folks who have attended meetings before, as well as new attendees, should note that there will be no formal dinner provided after this year's meetings, as has been the custom in years past. There will, however, be light snacks and beverages available at no charge during the meetings.

Much of the above represents the "nuts and bolts" of what will be going on around the meeting and info to hopefully help you in making arrangements to be there. The more important point is that if you will attend these meetings, you'll be very, very glad that you did. The people you'll meet, the conversations you'll engage in, the ability to see an actual cryonics facility; all of that should combine to make you, as it did me in my first meeting years ago (or as it does now in my return visits), fully realize that this concept is worth getting as involved in as you reasonably can. So, take a plane, take a boat, take a train, take a dogsled, hitchhike, whatever-it-takes, try your best to be there! You'll be very, very glad that you did!!

Making Your Voice Heard/Voting For Your Leadership

York W. Porter - Immortalist Society President

One of the most important things you do as a member of the cryonics community is, where possible and allowed, to cast your vote for the leadership of the organizations that are trying to continue to push forward the world-changing concept Robert Ettinger proposed. It is easy, in this day of electronic communications and entertainment, to get so wrapped up in the "cyber world" and other distractions of life that you forget "real world" activities that are of very real and long lasting importance.

A twelve person Board of Directors manages the Cryonics Institute on a day-to-day basis. Out of this twelve-person roster, four persons are elected each year. This both allows for some stability of the Board in keeping a hostile group from rapidly gaining control over the Board but also allows significant dissent to be expressed by making each member of the Board ultimately accountable to the Voting Members. To allow everyone to understand the concept of a Cryonics Institute "Voting Member", from the CI Bylaws it states: "To qualify as a Voting Member of the Cryonics Institute a CI Member must be age 18 or over and either be a Lifetime Member or have been a Yearly Member for at least three years. Additionally, only CI Members with an executed Cryonic Suspension Agreement and having full funding for the Cryonic Suspension Agreement may be Voting Members". Thus the Board is directly accountable to the votes of individuals who will ultimately be under the care of CI.

An additional thing to keep in mind is that each CI Voting Member has a total of four votes to cast and they may cast them in any combination they wish. They may cast all four votes for one candidate, one vote apiece for four candidates, two votes for one candidate, two votes for another, etc., etc. *Any combination of votes is allowed just so that no more than four votes total are cast. If more than four total votes are cast, the individual's vote will be considered "spoiled" and will not be included in the total count.*

One should also, if required on the voting form, be careful to sign the form. Again, failure to follow all the instructions associated with the form can result in the Voting Member's vote not being counted as part of the total. Also make sure to mark the form as clearly as you can. If it appears that a reasonable person cannot understand the way the form is marked, then the voter is in danger of having their vote not count.

The method CI uses to elect Board members is often called "cumulative voting". This is a relatively common method of voting in corporations and acts to allow a relatively small group of individuals to place a member on the corporation's Board of Directors. In the case of the Cryonics Institute, in any "contested election" (i.e., more than four candidates are running) a group of people consisting of twenty percent of the Voting Members, casting all their four votes for one person, plus one more person casting one vote out of the four for that same person, can ensure that the particular candidate is elected. While obviously not allowing this group to control the Board, it does allow them to place an individual in a position where the candidate of their choice is privy to all Board discussions and to any other bit of information a Board member is entitled to. Of course, simply having an individual of their choosing in a position to cast a vote that they will probably agree with is also an advantage to a group. Over the cycle of elections, this same group may elect three out of the twelve members of the Board which results in a strong, albeit not decisive, "voting bloc" on the Board of Directors.

As a service offered to all CI candidates, Long Life magazine also offers the ability of any candidate to place their physical mailing address, a telephone number, two e-mail addresses, and a web page address in the candidate info offered in the magazine and in its online version where web pages may be clicked on to take the reader to that web page. Thus members may both contact the candidate directly themselves through relatively conventional and electronic means. Members may also read, unedited, any viewpoint the candidate may wish to post on the candidate's own webpage. *NOTE: It should be kept in mind that the Immortalist Society provides this information solely for the benefit of its readers and does not automatically endorse all or part of any viewpoint expressed as any viewpoint is entirely that of a particular candidate.*

The Immortalist Society runs its elections in a fashion that is pretty much a conventional one. All four major officers, President, Vice-President, Secretary, and the Treasurer, are all four nominated and elected at the annual meeting. Thus the membership may replace all the officers of the Immortalist Society in each year. In addition, the membership may elect, at its discretion, any number of persons to serve as a "Member-at-Large" of the Board of Directors. These individuals serve, just like the "major officers" for a term of one year which begins on January the 1st in the year after the election is held.

There are various ways of making your voice heard in cryonics. Going to one of the online groups is one way. Starting your own webpage might be another. Writing for one of the cryonics publications might be another. But a very, very important way, when it becomes available is to make the best judgment you can in voting for who will be the most effective men and women that try to lead cryonics organizations which we are all ultimately dependent on.

2017 Cryonics Institute Board of Directors Candidates

STEPHAN BEAUREGARD

Hi, I'm happy to run for my re-election as a Director of this great organization. I presently serve as the Director that deals with Communications & Social Media.

I'm 48 years old & I have been interested in cryonics since 1993. I did several public relations activities for CI & I intend to do more. I did also many interviews about cryonics. I'm in touch with our President practically everyday to give him advice & suggestions to try to improve CI. I convinced & helped many persons to get signed up. I found willing people to help my fellow cryonicists. I also translated CI documents & Cryonics videos for more widespread understanding for those in countries other than the USA. As I promised, I set up a partnership in Canada (pick up the patient, ice bath, perfusion with CI-VM-1 & shipment to CI). No matter your country, you will be able to have me to help & defend our organization. If you want a friendly Director who likes working as a team, with family values, leadership, a positive outlook, clear goals with real results for CI & 110% loyal, vote (4) me. Thanks / Merci / Danke

stephan@cryonics.org

BLAKE DELANEY

Blake Delaney was educated in biochemistry and computer application development. His professional career includes corporate programming and investment management. He and his wife are lifetime CI members. Blake is a volunteer in the cryonics community, especially in the area of emergency preparedness. He works with our current president in efforts to improve the statistical risks and returns of CI's investment holdings.

His goals for the Cryonics Institute include: 1) Maintain beneficial investment profiles so that CI can continue its financial health while keeping our lower member prices. 2) Encourage controlled growth, including expanding membership counts and geographic reach to improve high-speed emergency response. 3) Maintaining CI's core services with high reliability and redundancy. and 4) Staying abreast of scientific or technological advancements that could help with CIs primary mission.

"I would be honored to have your vote, and serve as a director. CI fulfills an essential role in the advancement of human life extension."

Blake7H@gmail.com

STEVE LUYCKX

Steve Luyckx was born in Detroit, Michigan, the fifth of six children. He graduated from Michigan State in 1986 with a BA in Logistics and a Masters degree in Finance a few years later. His professional career includes Kraft Foods, Chrysler/Daimler Financial and in 2009 he became the President of a joint venture between ADP and Reynolds. He first became interested in cryonics when a neighbor friend who was an important influence in his life introduced the topic. He has been one of the longest devoted board members dating back over 20 years and has attended every annual meeting since 1988.

sluyckx@gmail.com • cell phone number 248 840 3936:

2017 Cryonics Institute Board of Directors Candidates

DENNIS KOWALSKI

Dennis Kowalski is a Fire Fighter and a Nationally Registered EMT-Paramedic (NREMT-P). He is certified in advanced cardiac life support (ACLS), advanced pediatric life support (PALS), and as a AHA CPR Instructor. He also teaches emergency medicine to other emergency responders. His experience in emergency services has made him a vital asset as a CI director and he is eager to share what he has learned as a bridge between conventional emergency medicine and cryonics. Dennis's goals are to see positive growth and stability in CI membership. He'd like to see local support groups formed to promote unity, education and faster cryonics response. He is currently serving as CI's President and has overseen many positive changes, including a revised CI website and social media channels, the new Standby Kit and manual, coordinating the annual AGM, member outreach, public and media relations, CI Magazine, membership growth initiatives, negotiations with international organizations on behalf of CI, cost-savings measures, investment growth strategies, an updated members-only forum, facility and operational improvements and more. If you like the direction Dennis has taken CI to date, please vote to reelect him.

dennis@cryonics.org

DIRK NEMITZ

Dirk is a 39-year-old German, but has also lived, worked and studied in Benin (West Africa), Costa Rica, New Zealand, Nicaragua, Norway and the US. His background is in forestry/biology and with further training in digital marketing. He currently works for an international organization on sustainable forestry and reducing tropical deforestation to keep our planet green and livable for our long and prosperous future.

Dirk signed up with the Cryonics Institute in 2007 and has been volunteering vividly for cryonics in Germany ever since. As a CI director he would aim to contribute to: (1) strengthening standby and field cryopreservation through testing and feedback, also from the German/European perspective; (2) enhancing options for interaction among interested members, including through online meetings; (3) professionalizing CI's social media outreach strategy and updating the CI website (e.g. ensuring that all information is up-to-date).

Physical mailing address: Dirk Nemitz, Neuenhofer Str. 52, 53773 Hennef, Germany
Email address: dirk@naturecon.de
Facebook: https://www.facebook.com/dirknemitz.de
Webpage: www.dirknemitz.de

ANDREW ZAWACKI

I have worked for the Cryonics Institute for more than thirty two years. At the Cryonics Institute facility I am in charge of the day to day operations, patient suspensions, patient care and member services. I have served as a director of the Cryonics Institute for nine years and I also serve as the corporate secretary.

Cryonics Institute Membership Statistics:

As of August 2017, the Cryonics Institute has 1,424 members, up 17 from our last report. Of the 1,424 Members, 222 have arrangements for Suspended Animation Standby and Transport.

There are 157 human patients and 142 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.

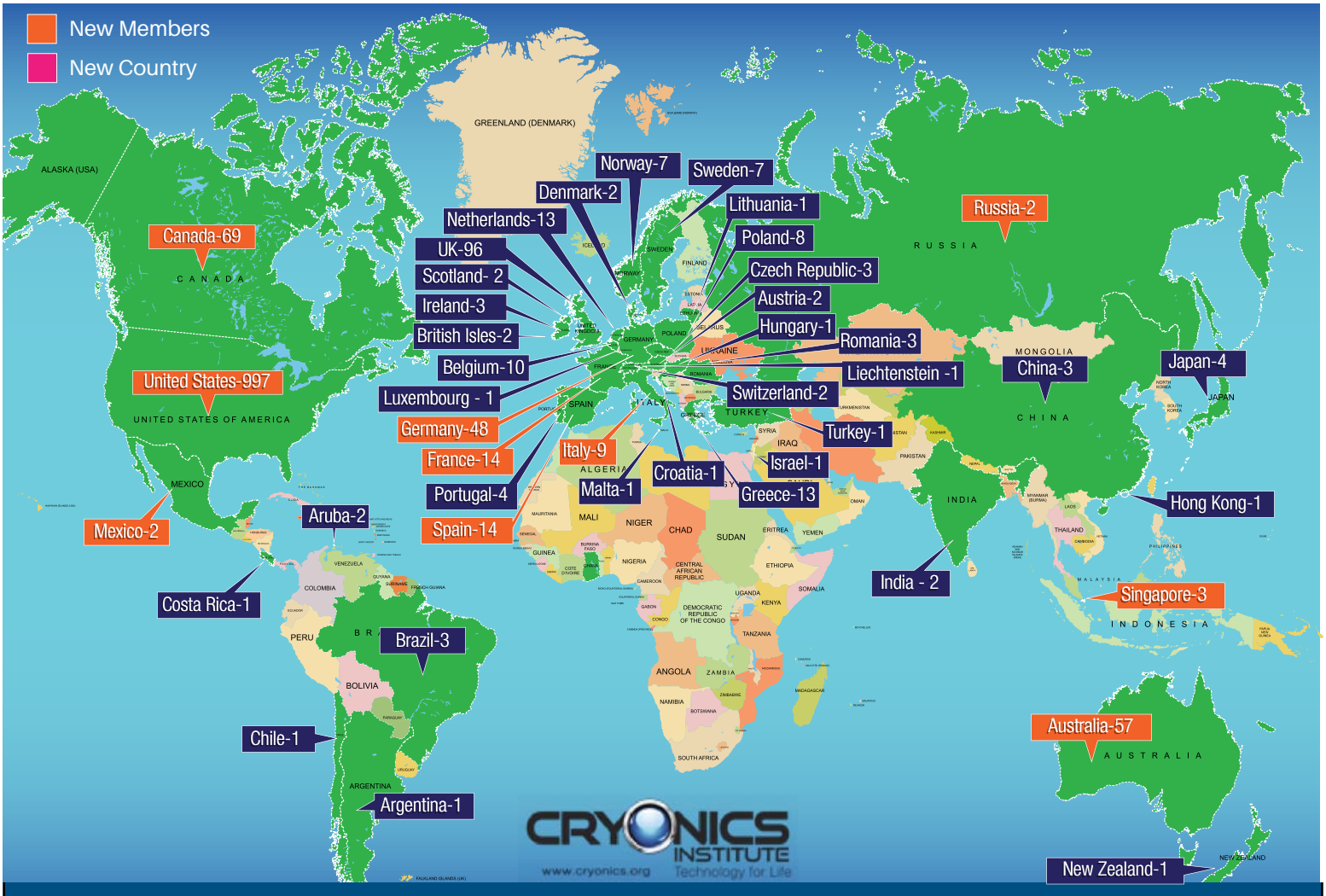
CI MEMBERSHIP

AUGUST 2017

* New Members = Increase in Membership since last issue

Members	1,424	Pets	142
Assoc. Members	185	DNA/Tissue	254
Patients	157	SA	222

TOTAL **1,766**



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 is a non profit French organization working closely withEuropean cryonics groups. For more information : J.R. Missonnier: phone: 33 (0) 6 64 90 98 41or e-mail: cryonics news.inpi@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 organization is called "Deutsche Gesellschaft für Angewandte Biostase e.V.", or short "DGAB". More information on their homepage at www.biostase.de. If there are further questions, contact their Board at vorstand@biostase.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
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.

The Technology of Repair, Revivial and Rejuvenation

Part II

by York W. Porter

Preliminary remarks by York W. Porter, Immortalist Society President

This is the second installment in this series. As stated before, one of the basic questions in cryonics is just "how" it will work. Since its inception, critics have utilized the quite understandable inability of Robert Ettinger, in his original writings, to fully outline the exact specifics of future science capabilities to try to poke holes in the concept Ettinger developed. (The critics were frequently in error then, and are even more so now). While it isn't possible, even at this date, to fully determine the particular details as to the exact mechanisms that will be needed and/or utilized to make cryonics a working reality, it is possible to go into the subject to such a depth that any reasonable person would have to conclude that, whatever their particular preferences or viewpoints, cryonics is a quite sensible and rational thing to do for those persons with an interest in extended physical life. This "second installment" basically takes up with additional efforts by very talented and intelligent individuals

Dr. Charles Tandy served as the editor of the book, The Prospect of Immortality: Fifty Years Later, to which I contributed a chapter (Interested readers may purchase a copy of Dr. Tandy's excellent book on amazon.com). The information presented here, as well as in future installments of this series, basically first appeared there, and then was slightly edited/updated and then was utilized in a series in Cryonics magazine, the house publication of the Alcor Life Extension Foundation. Readers should note that this article might differ, however slightly, from the material published in Cryonics and in Dr. Tandy's book.

GREG FAHY'S PAPER: A "REALISTIC" SCENARIO FOR NANOTECHNOLOGICAL REPAIR OF THE FROZEN HUMAN BRAIN

Gregory Fahy, a well-known and respected experimental cryobiologist, received his undergraduate degree in Biology from the University of California, Irvine, and his Ph.D. in Pharmacology from the Medical College of Georgia in Augusta. With over thirty years' experience in cryopreservation, he has a rich background in his field and is certainly worth taking seriously.

Fahy, in *Cryonics: Reaching for Tomorrow*[49] (CRFT, Alcor Foundation, 1991, 1993), has a cryonics-friendly article entitled "A 'Realistic' Scenario for Nanotechnological Repair of the Frozen Human Brain" (listed as "Appendix B" in the table of contents). Cryonics is controversial in cryobiology, and Fahy accordingly supplied this disclaimer (just before the table of contents, 1993 edition.):

> I am not a promoter or advocate of either cryonics in general or Alcor in particular. I have permitted Alcor to use "Appendix B" because I feel that elevating the level of discussion between cryonicists and cryobiologists would be beneficial to both groups. Appendix B was written primarily out of intellectual curiosity in response to Dr. Ralph Merkle's paper "The Molecular Repair of the Brain." It represents my personal attempt to decide for myself whether a reasonable repair scenario can be delineated. This is simply one means of trying to find the truth. As a scientist, it is my duty to seek the truth even if (and perhaps especially if) the truth may be unpopular.[50]

In another paper, "A Scientific Critique of 'Molecular Repair of the Brain'"(Alcor website[51]) Fahy expresses disagreement with some of Merkle's thoughts on solving this central problem in cryonics, to which Merkle replies in depth. Both Fahy's critique as well as his own thoughts are too lengthy and technical to treat in depth here, but I will summarize.

Fahy's focus throughout is on "realistic" repair scenarios which he defines as "scenarios that might actually be applied, with appropriate modifications, to the restoration of the brains in cryonic suspension."[52] He means to distinguish his approach from "general proofs of principle…that attempt to demonstrate general feasibility without considering documented biological problems in detail."[53] This implied challenge to the Merkle scenario is underscored by noting that "[n]o 'realistic' repair scenarios have previously been proposed to the knowledge of the author."[54]

Fahy then goes on to establish four criteria he believes are essential in dealing with repair scenarios: (1) factual basis, (2) parsimony, (3) detail, and (4) testability. As for "factual basis," one must base repair concepts on what is "known or can be inferred" about the actual injury that occurs in brains that have been subjected to cryogenic temperatures. Such knowledge would come from experimental work. "Parsimony" means to avoid making unnecessary demands of the repair task. One must certainly address what is important but also bypass, as far as possible, what is not. "Detail" must be sufficient to determine how the important tasks will be handled. We don't want be in the predicament of the two problem-solving scientists in the cartoon who are bent over a blackboard filled with mathematical equations and one says to the other, "then a miracle occurs!" Finally, proposed approaches must be testable, to distinguish what works from what doesn't, something of central importance in all science and technology.

After establishing the four criteria and some "ground rules" to exclude "extraneous problems" (postmortem damage, transport injury, and so on), Fahy addresses specific problems encountered in low-temperature biological work, such as perfusion damage, freezing damage, osmotically-induced cellular shrinkage, and phase transitions. Sometimes the problem is minor; otherwise, it is considered at length, as in the section on constraints on repair. Details provided include micrograph images and extensive references. (The technical and detail level here will be a challenge to some, but this is important thinking.)

In his "Scientific Critique," Fahy speaks of specific concerns he has about Merkle's viewpoint. There might not be enough "activation energy" at the low temperature to cause a needed chemical reaction. Repairs might not hold up as the temperature is increased. (For example, repaired ("renatured") proteins might denature once again.) Tissue could be damaged on warming by thermal stresses. What would be the power source of repair devices at ultra-low temperatures and how would that power input affect the tissues themselves? If you tried to address the repair problem mainly electronically, using images of the damaged tissue to work out what ought to be there, would the processing time be prohibitive?

As for repair of cracks in tissue subjected to ultra-low temperatures:

> Merkle says, on page 37, "if any cracks are present in the initial database (describing the frozen tissue) then the revised database (describing the healthy tissue) should be altered to remove these cracks." But "removing these cracks" is a non-trivial exercise, and we are told nothing about how this might be possible. In the end, we are left only with an apparently unsupportable assertion that it should be possible. And this is the problem that cryobiologists have had with cryonics all along.[55]

Fahy winds up his critique on a cautionary note:

> Ralph Merkle has written an excellent paper which attempts to identify important issues of the repair of frozen brains. He deserves praise for his great intellectual effort and for many of his results. From the point of view of a cryobiologist, however, Merkle's analysis falls far short of being convincing. It is based on a number of assumptions that have dubious validity, and it fails to be specific. While the present critique by no means rules out the possibility of developing repair technology for frozen brains, it may help to clarify why the disagreements between cryonicists and cryobiologists are not likely to be settled by Merkle's paper.[56]

RALPH MERKLE REPLIES TO GREG FAHY

As indicated above, Ralph Merkle's paper has been under continuing revision since it first appeared in 1989. The latest (and much expanded) version can be found on Merkle's website. In his response to Fahy's criticisms, Merkle indicated that the general approach proposed in "repair of the brain" is, roughly:

1. Digitize the frozen structure.

2. Once the database has been built, use it to determine where damaged structures are; they can then be "repaired" electronically and thus eliminated from the database.

3. The "revised" database can then be used to help reconstruct the original "undamaged" brain.

Merkle points out that Fahy is basically erroneous when he says in his critique: "Merkle's paper does not seek to tell us how to repair a frozen brain. It seeks only to describe peripheral issues of information content, computational speed, etc." Merkle responds:

> Dr. Fahy's statement that these issues are "peripheral" is wrong, for they are quite central. The claim that computer power of the magnitude required will likely be available in the future is not immediately obvious. If we expect people to believe this claim, it must be supported by a careful analysis of the relevant facts.[57]

Merkle concludes that a simple "divide and conquer" approach, in which the human brain is "divided into pieces small enough that they can be directly analyzed…" should be sufficient.

In response to Fahy's position that Merkle's proposal isn't "specific" enough,

Merkle writes:

> The paper did not discuss in any detail how "nanotechnology" works, but simply provided some general reasons for believing it is plausible and references for further reading. A detailed discussion of nanotechnology would require writing a rather detailed technical book.[58]

But, Merkle continues: "The final concern is how to build a structure with atomic precision, given the blueprint." Merkle later talks about six general approaches to repair. The least demanding is building an "artificial brain," using the digitized information that was gathered from the frozen brain. He then discusses building an actual human brain. A working human brain is a "dynamic" structure, in a constant state of change, so repair efforts might well be more difficult. Merkle proposes some scenarios to provide needed stabilization:

- Synthesizing the structure at low temperature.
- Synthesizing the structure in a dehydrated state.
- Synthesizing in a normal "wet state" but stabilizing major macromolecules by cross linkages and the like.
- Synthesizing in a normal "wet state" but with:
  - minimal stabilization aimed mainly at the membranes
  - prevention of entry of oxygen/ other reactive chemicals
  - allowing "harmless" diffusion to take place
- Synthesizing the brain using "the same intermediate states that are used during normal growth."

(This last strategy aimed at working on a human brain in a "non-dynamic" or at least "reduced dynamic" state would, according to Merkle, be achievable by placing an "on-board computer" in control of cell metabolic activities, including cell division, cell shape, and cell movement.)

Merkle then deals with the "tradeoffs" of each approach, reiterates that computer analysis is fundamental, talks about chemistry at low temperatures ("Chemistry can be done at 0 Kelvin"[59]), discusses power sources for the repair method he proposes, and further considers time requirements for his original proposal. In summary: "Both by minimizing freezing damage and maximizing repair capabilities we will achieve the highest possible probability of success."[60]

Whichever side of this very complicated discussion one finally falls on, the extensive discussions between Greg Fahy and Ralph Merkle are, to this author, the same sort of in-depth discussions that occur all the time in good and proper scientific endeavors.

The constant tug, back and forth, between theoreticians and experimentalists (and theoreticians and other theoreticians and experimentalists and other experimentalists) is what fosters the progress we have been blessed with in science and technology.

Few scientists are strictly experimentalists or strictly theoreticians, most instead having training on both sides of the scientific spectrum. Still, good experimentation affects theoretical viewpoints, which in turn affects the thinking in the next round of experiments. The give and take, back and forth between the two camps results in the best outcome overall and the best and most efficient use of scientific resources.

As for which of the two talented and dedicated researchers, Merkle or Fahy, is "right" and which is "wrong," the answer basically is "stay tuned." Time and further research may well show that, as in Merkle's remark about the "highest probability of success," both camps are progressing toward the same finishing point, just from somewhat different starting points.

ROBERT FREITAS, J.D.

Robert Freitas has had an interesting and varied career. His high school education included some college-level chemistry. His undergraduate degree was as a "double major" with a bachelor's in both physics and psychology (1974). He then attended the university of Santa Clara Law School, receiving his *Juris Doctor* in 1978.

Maintaining a wide diversity of interests in his educational career and later, Freitas has written more than 150 papers, chapters of books, and popular articles on a wide range of topics from science to the law. One of his very interesting proposals, introduced in 1996, was a design for the so-called "respirocyte,"[61] an artificial blood cell that would be able to carry oxygen to the tissues and carbon dioxide away, just like a regular red blood cell.

The difference, and a very substantial one, is that the respirocyte would be vastly more efficient, able to transport 236 times more oxygen. In addition, it would be smaller and able to enter places red blood cells could not, where circulation might be restricted due to disease or injury.

Some uses of the proposed (still theoretical!) respirocyte are fairly obvious. Patients whose cardiac output was insufficient would benefit from the greatly enhanced oxygen-carrying capacity. Divers would be able to dive for greatly extended periods of time while avoiding decompression sickness (the "bends") as well as "nitrogen narcosis," decreased mental function which can lead to fatal error. In the

case of organs and tissues needed for transplantation, respirocytes could greatly extend preservation, especially at low temperatures. The respirocyte would also be useful for trauma victims, for whom a major cause of death is bleeding. While still a theoretical concept, Freitas's work shows both his versatility as a thinker and the great potential nanotech's future arsenal could have in helping the sick and injured, which might well include cryonics patients.

A later and more detailed paper of Freitas is about artificial white blood cells which he calls microbivores ("microbe eaters").[62] The microbivore would be able to act as a phagocyte in the case of infectious disease processes. It is, again, an example of how nanotechnological devices may ultimately furnish health benefits to mankind beyond present measure and how existing body repair mechanisms might be greatly enhanced by intelligent design.

RALPH MERKLE'S 1994 EFFORT TO BLEND THE TECHNOLOGY OF CRYONICS AND THE FIELD OF CRYPTOGRAPHY

In 1994 Ralph Merkle wrote a paper titled "Cryonics, Cryptography, and Maximum Likelihood Estimation."[63] Eminently qualified in cryptography, Merkle uses his expertise to address problems in cryobiology and cryonics, mainly, how to fix damaged cells and tissues and thereby, of course, whole organisms. Clearly it's a tall order to fill, with several as-yet unsolved problems: tissue fracturing, the patient's terminal illness or injury, possible ischemic damage and/or cryoprotectant toxicity, or uneven (or absent) cryoprotectant perfusion in vital areas. "And yet," he tells us, "the literature on freezing injury, on ischemia, and on the other damage likely caused by a cryonic suspension forced me to conclude that cryonics would almost surely work: how can this be?"[64]

The explanation is both intriguing and well thought-out. It begins with the fact that, like every other structure in the universe, human beings are made of molecules. As in his previous work, Merkle points out that the arrangement of the molecules is what really counts. Health and sickness, youth and old age, pain and pleasure, life and death, all depend on the arrangement of and, thereby, the interactions between the molecules of an individual person. Present day medical procedures, such as surgery, try to "rearrange things" in a crude and inefficient way. Healing isn't really "done" by present day medicine so much as conditions are provided for the body, through its own amazing "nanotechnology," to heal itself.

The body's nanotechnological devices developed through countless eons by natural, unthinking processes. This arsenal is fantastic, yet still not good enough. People get hurt, people sicken, people die. If we can enhance nature's arsenal by intelligent design, the prospects seem virtually endless. The ability to move molecules and atoms at will and arrange them as we think best, consistent with scientific laws, would address any disease entity we can think of, including aging.

A sick patient was likely in a state of youthful good health at one time in life—or if not, others could furnish a "pattern" for what youthful good health would be. The job of medicine, as indicated previously, is then to place the "sick pattern" of the patient's atoms and molecules in an arrangement of youthful good health using molecular manipulation tools. Those same medical tools can be employed in cryonics to rearrange the frozen tissue's atoms and molecules in the way we see fit. We'll no longer be restrained by the crude measures of today. If the molecules are in the "wrong" place, we can move them to the "right" place, supportive of a youthful state of health. The only necessity will be to know where the "right" place is.

The concept of nanotechnology is an amazing development in human history. The ultimate promise of it is tremendous and almost beyond measure in areas from energy to healthcare. But it isn't limitless. It won't help someone who, say, is vaporized in a nuclear blast, or more mundanely, cremated without some preservation of parts. If enough DNA can be found of that person through tissues deposited by accident (for example, licking the glue of an envelope to seal it) or by intent (preserved surgical specimens), then perhaps a clone (genetic twin) can be grown. A twin sibling isn't you, however.

This means that enough structures must survive for future nanotechnologists to have some sort of concept of what repairs need to be made. Ideally, this would involve the ability to fully restore memories and personality structures. The worst case, as just noted, would be where nothing exists for future scientists to work from. Nanotechnology will bring great power but not omnipotence. For those undergoing cryonics procedures, however, the words of Merkle are quite heartening:

> Even after many minutes or hours of ischemia and even after freezing we can still recognize the cells, trace the paths of the axons, note where the synapses connect nerve cell to nerve cell—and this with our present rather primitive technology of light and electron microscopy (which is a far cry from what we will have in the future).[65]
>
> If we can tell where things should go, then we can in principle (and eventually in practice) restore the patient to full health with their memory and personality intact.[66]

The key question then is when can one tell "where things should

go"? And, even if this is true for those who get the best "cryonic suspension" (a two-word phrase for the procedures associated with cryonics), what of those who receive less than optimal treatment? When are things so hopeless as to warrant no action at all? How much damage is too much damage?

This is where Ralph Merkle's considerable skills and knowledge in cryptanalysis come in. Cryptanalysis deals with unscrambling scrambled messages, trying to make sense of what appears senseless at first sight. In the case of the Enigma coding machine used by the Nazis in World War II, the task of cryptographers for the Allies was to take the Enigma-encrypted messages or "ciphertext" before them and work their way "backwards" to the unencrypted "plain text." The Germans thought they had an unbreakable coding machine—Alan Turing and others on the Allied side proved them wrong. Cryptanalysis carried the day and played an important part in the Allied victory.

Likewise, information about someone in cryopreservation is a (somewhat) scrambled version or "ciphertext" of the "message" or "plain text" that existed before they were cryopreserved. All the changes that occurred from "before" to "after" result from known chemistry and physics. One must try to "decipher" the ciphertext to obtain the plain text. As Merkle puts it:

> So the question of whether or not we can revive a person who has been frozen can be transformed into a new question: can we cryptanalyze the "encrypted message" that is the frozen person and deduce the "plain text" which is the healthy person that we wish to restore? Are the "cryptographic transformations" applied during freezing sufficient to thwart our cryptanalytic skill for all time?[67]

Remember again that, as was pointed out by Thomas Donaldson, the atoms and molecules comprising the cells and tissues under cryopreservation are not totally scrambled. The damage is not like an explosion, where things are tossed about willy-nilly. (And even for an explosion there is a relationship between where parts wind up and where they started out which can help in figuring out the state of things before the explosion went off.)

It is also true that any atom of a person in cryopreservation was, generally speaking, part of a known biological structure or system (like the sodium and potassium atoms that, in their exchange across a membrane, form the basis for nerve cell action) before the cryonics procedures were applied. So there is structure (and redundancy) in the human body (and, more importantly, the brain), plus our knowledge of biological structures is growing in extent and accuracy with each passing year. When it's time to resuscitate we should have substantial clues as to where any atom or molecule "should" be. Transforming these clues into a deciphered (restored) structure could be aided by an advanced mathematical technique known as "maximum likelihood estimation," as Merkle points out. The whole operation, he also notes, will be empowered by an expected, vast future increase in computer power. The operation might involve a series of steps of generating proposed restorations of some particular damaged tissue. The result on a given step could be tested in a computer simulation and compared with the previous results to see how "right" it is. As Merkle puts it,

> If the result is more reasonable, we are moving in the right direction and should continue. If the result is less reasonable we are moving in the wrong direction and should stop and try some other direction.[68]

By way of analogy this can be compared with assembling a cardboard jigsaw puzzle. At the beginning the maybe thousands of pieces are all scrambled up into "ciphertext." You want to rearrange them into "plain text"—the finished puzzle showing the beautiful picture on the box the puzzle came in. Your efforts will involve knowing what the finished product "should" look like, plus some judgment during the assembly process about whether you are going in the "right" direction.

Maybe you see that, in juxtaposing two pieces, the green border of one can't go with the brown of the other, and you abandon that combination and try another which does work. Eventually, after enough effort, the picture on the box emerges in all its perfection and glory and can be framed and put on the wall.

This isn't to say that the cryptographic approach to cryonics resuscitation would be invincible and able to deal with any level of damage. Merkle comments: "If there has been so much damage that we are unable to infer sufficient local structure to allow even an incremental improvement in our description of the system, then this approach will fail…"[69]

Contrary to the case of someone who has been cremated, there has to be part of the "jigsaw puzzle" that has survived, to provide a starting point toward solving things. Merkle puts the good news as follows:

> In the case of the frozen human brain, there is typically a wealth of information about the neuronal wiring…unless the structures involved have quite literally been obliterated. Or, as experience with erasing top secret media has demonstrated, it's hard to get rid of information when sophisticated means of data recovery are employed. And we'll have very sophisticated means of data recovery available to us in the future.[70]

(As an aside, one should also remember that the most important organ

in any person is, of course, the brain, which contains the "identity" of the person. Its reconstruction with great fidelity is of paramount concern. In other tissues such as the heart, the important thing is to restore an adequately functioning replacement, not necessarily an exact copy of the original. By analogy with today's medicine, it's okay if a transplanted heart is pumping blood adequately and not under attack by the immune system, even if it's not exactly like the heart that the patient was born with. The particular structure of the heart or most other organs means no more to personal identity than hair color).

MIkHAIL SOLOVIEV'S PAPERS ON REPAIR SCENARIOS

Mikhail Soloviev holds the equivalent of a master's degree in biophysics from St. Petersburg State University, Russia, and has worked with the design and development of models for neurocomputers, molecular computers, and complex biological systems. In 1996 he wrote an article titled "SCRAM Reanimation,"[71] followed in 1998 by "A Cell Repair Algorithm."[72]

SCRAM is an acronym derived from "Scanning," "Computer Reconstruction," and "Atomic Manufacturing." Soloviev's concept resembles Merkle's proposal for the repair of a cryopreserved brain, but is expanded to consider restoring the whole body using what Soloviev calls the "MASM" or Macroscopic Atomic Scanner/ Manufacturer. A main ingredient of the MASM in turn is the "nanosyringe," a "device to capture and recognize, or release and connect, atoms."[73] Essentially a kind of probe like what is used in scanning tunneling microscopes, the nanosyringe would additionally be hollow like a hypodermic needle and able to place or remove atoms.

The MASM would use an array of nanosyringes to destructively map a cryonics patient's body, each atomic layer being removed to expose the next layer. As the layers are removed their information is stored so that afterward an ultrastructural image of the body in three dimensions is obtained (step 1). As in Merkle's idea the resulting database is then manipulated to determine what changes in atomic position would be needed to obtain a healthy, youthful version of the body (step 2). Finally, with advanced manufacturing methods the revived, repaired and rejuvenated patient is actually constructed (step 3). For this last step either atoms similar but not identical to the original would be used, or, for those having philosophical worries, the original atoms could have been saved and would now be restored to their original positions, consistent with rejuvenation.

Soloviev's concept is quite well thought-out, if also quite theoretical. Several calculations indicate the thickness of each atomic layer and the likely number of atoms in each layer. The time estimated to scan/ ablate and also to manufacture an individual layer is set at about one-thousandth of a second. So we have another approach to the problem of cryonics resuscitation by a knowledgeable, intelligent devotee.

In the 1998 paper Soloviev tackles the task in a very similar manner but with more detail in some places and limited to the brain only. The brain would be scanned, with surface ablation of each single layer of atoms, and a database of atomic positions built up. The brain sections would be rebuilt after determination of a healthy configuration. Some computer code in the PRoLoG language helps illustrate what a "cell repair program" for a computerized repair system would look like. As in Soloviev's previous effort, it is a serious, well thought-out if speculative scenario for how cryonics might be made to work.

TAD HOGG: INFORMATION STORAGE AND COMPUTATIONAL ASPECTS OF REPAIR

In this article in *Cryonics*, 3rd Quarter 1996, Xerox PARC researcher Dr. Tad Hogg offers a succinct and accurate definition: "Cryonics is an attempt to preserve enough of a person's body, after death by current standards, to allow future technology to restore the person to health."[74] In the first part of the article, Hogg points out the regrettable facts that the procedures involved in cryonics are not damage free themselves and also not always timely. Future technology will have its work cut out in using surviving structural "clues" for high-fidelity reconstruction of the patient.

Giving credit to Ralph Merkle and his 1994 paper, "The Molecular Repair of the Brain," Hogg sizes up matters as follows:

Three distinct technical abilities are required for repair:

1. Observe, in sufficient detail, the preserved structure
2. Compute what changes need to be made
3. Manipulate the structure to make those changes The scale of these operations (e.g., molecular or cellular) will depend on the amount of suspension damage.[75] (one might also add, "and pre-suspension damage as well.")

The second step in the above scenario, as Hogg indicates, is primarily a problem of computation. In some cases, of course, the details of a particular preserved structure should not matter; a more "generic" version would do. This we would expect for the body and most organs, which are, after all, a support system only for the "real" person, which resides in the brain. (In fact the body that a cryonics

patient returns to consciousness in may be considerably enhanced or changed in constructive ways over the original, with the same "person" still happily inside.) The brain, as we have noted, would have to be treated more carefully. We hope to recover what should be there, a unique structure that we know was present originally, from the preserved remains we start with. But, Hogg tells us, there could be a further complication:

> Even when there is a unique structure, the time needed to find it by searching through the enormous set of possible structures can mean, in practice, the original structure cannot be found.[76]
>
> This remains true even with much more powerful computers… with the possible exception of (so far, hypothetical) quantum computers.[77]

(Author's Note: the *Wikipedia* article "Quantum Computers," accessed Sep. 1, 2015, notes that "the development of actual quantum computers is still in its infancy." Stay tuned, though!)

We are reasonably sure that personality traits such as memories, likes, dislikes and such are traceable and (in principle at least) recoverable from specific, detailed brain structure. The brain, unlike other organs, is not simply replaceable with a "generic" version that functions adequately in the body of the recipient. If all we could reconstruct of a person, neurally, was a generic brain that lacked the original, detailed structure, it would seem to meet Merkle's criterion of "information theoretic death" and the person would be "gone." (Such might follow if the original brain was lost but we still had a DNA sample, or even more primitively.) Yet having this generic structure might still be better, in some reasonable sense, than just giving up and having nothing at all. It would seem to beat the alternative of total oblivion.

We could thus imagine a scenario in which a generic brain is imprinted with basic functionality using advanced technology, relying on records of the past, which, however, are scanty in many important details. The resulting person would remember their name and even speak their native language. They might know a lot about the customs and traditions of the world they came from, how they should and shouldn't behave, and details of advanced education or training that records suggest they once had. In many ways they might seem like the original person, able to carry on conversations and reason and emote much as before. It is understandable, though, that people who value their personal survival would want more than just a "tabula rasa" operating system with this kind of basic functionality added.

So the question is, how much information is needed to adequately replicate a particular brain structure that is, in the case of each individual, unique in the history of the world due to each person's quite individualized life experiences as they go down through the years?

The answer to the question of "how much" is, of course, "the more the better." Not only information gathered by medical and scientific instrumentation but perhaps even more relevantly, information produced by the individual during the parts of their life when they were able to clearly recall and/or document what was happening. Artifacts such as photographs, videos, audio recordings, et cetera might diminish the task of accurate brain reconstruction.

In an example of the importance of what may seem like otherwise trivial information, this author remembers a high school teacher who gave my class a thought experiment to ponder. Suppose we were archaeologists in the future and the only artifact we found of the United States was a copper penny. What conclusions could we draw? Initially quite skeptical about this enterprise, the class gradually produced a fairly long list. The coin was copper, which meant that some sort of mining skills and industry must have existed, along with metal smelting (including high-temperature furnaces) and other metal-working skills and equipment. Some sort of drawing skills had to exist to provide the likeness of Lincoln, and writing skills due to the markings on the coin; the list goes on. One is reminded of the famous Sherlock Holmes story in which the key fact was that the watchdog didn't bark, allowing Holmes to narrow down the otherwise enormous list of suspects to those with whom the dog was familiar. A small and seemingly unimportant detail could lead to solving an otherwise impenetrable puzzle.

As an additional nod to the concept of traditional and "low tech" personal historical records, consider that, given that audio and video recordings didn't exist until recently, all the knowledge of ancient civilizations has come through two sources, artifacts that were found and writings that survived. (The tragedy of the destruction of the Great Library at Alexandria can scarcely be overrated.) Ancient Romans, for example, were prolific letter writers which enabled scholars to use the "only a penny found" methodology on these letters (as well as other writings), coupled with the extensive remains of buildings and other artifacts, to construct a vivid, albeit not perfect, understanding of this ancient civilization. In these reconstructive efforts they have also obtained much information about some of the individual members of that civilization, *though those people are very long dead.*

In the case of Christianity, knowledge of the existence of its central figure, who came from an otherwise very obscure outpost of the Roman Empire, proliferated through word of mouth but also through written records transcribed decades after his life. Those records have survived for millennia and still inform us. In the case of Ancient Egypt a remarkable chain of events led to a detailed understanding

through ancient records written in hieroglyphics. Knowledge of this writing system had been lost but the discovery of the Rosetta Stone with its multilingual inscriptions, in which text in hieroglyphics could be matched with equivalent, and still-understood, ancient Greek, provided the key to decipherment.

"High-tech" thinking and technology may be of vital importance in getting the "brain engine" cranking once again, yet there is definitely a place for more traditional and lower-tech options also, and in some cases, a combination of both. Hogg puts it this way:

> External records can also help evaluate the quality of repair. In fact, this might be the only way to determine when a repair is complete, instead of "just" producing a similar, healthy individual. Even if it doesn't help a particular case, this evaluation could help improve future repairs by showing what information is sufficient for repair with a given level of technology.
>
> Other reasons to maintain records include the information's value to you and providing your preferences for various repair options that may be, from a purely technical point of view, equally likely to work.[78]

In an aside to his article, Hogg provides an interesting and informative example of using a series of coins as a model for the general problem of reconstructing (resuscitating) cryonics patients. using a thought experiment (which could, of course, be easily replicated in real life) of restoring ten coins that were originally showing a particular sequence of heads and tails, Hogg talks about how small bits of information can greatly help the process of reconstruction. If one knows, for instance, that "the first and second coins in the row of ten must both be heads or both tails," the original list of over a thousand possible initial configurations can be whittled down considerably (in this case by half). Further available information, such as, in this case, that "the seventh and eighth coins in the row of ten must also both be heads or both tails," further narrows the possibilities.

In the human body, the fact that small amounts of additional information can be used in helping narrow down the original number of possibilities, could work to great advantage. Individual atoms, whether of carbon, oxygen, hydrogen, et cetera, normally belong to molecules and structures that have a particular function and position inside the organism. Even in the case of individual ions like sodium and potassium, which could be found near or in neurons, their function in the scheme of things isn't just random but has a specific role. They are the basis for neurological activity through their exchange across the semipermeable membrane of nerve cells. The same could be said for oxygen found in certain locations, given oxygen's utility in respiratory and metabolic functions. So, it isn't just a case of "we found this single atom, what do we do with it?" Instead, most likely the atom was part of a system whose understanding will provide information about where the atom should go, or whether the whole system should not just be replaced with something equivalent. By continuing this kind of effort, using corrective feedback from further bits of information gathered as one goes along, successes could be verified and it could become clear that one is replicating the original set-up with reasonably high fidelity.

One may think of the general process of restoration as dealing with a large spreadsheet with a great number of individual cells or records. Any particular record may not seem very relevant at all, for example, whether someone likes to play golf or not, but, in combination with other records, a unique pattern not found in other spreadsheets begins to emerge. Someone who likes to play golf is not rare, but let's combine this with other traits. Suppose they also love chess, like drag racing but not oval track racing, and are a moderate fan of the Dallas Cowboys football team but an avid fan of the Kentucky Wildcats college basketball team. Suppose fnally that they don't like to watch professional basketball at all. Sports marketers would seize on all this information to figure what this person would likely buy and how they would likely act. Similarly, some psychological (and therefore brain) patterns in humans may be fairly widespread, but knowing individualized information about a person, as can be provided through diaries and other personal records, can make the "database" of that person more nearly unique and, therefore, more useful in doing a high-fidelity reconstruction.

As part of this interesting, helpful paper, Hogg considers, not only what types of information could be useful in the future restoration of cryonics patients, but also what types of storage of this information would be best: "Finally, remember one of the real benefts of external records: redundancy. Make copies, perhaps in multiple formats, to save."[79] (Maybe we should add that, as in the case of the Rosetta stone, and perhaps using online automated language translation, make copies in several languages as well.)

This article is an updated version of a chapter
which appeared in the book
The Prospect of Immortality: Fifty Years Later
edited by Charles Tandy, Ph.D. Readers
interested in a copy of the book may
check on Amazon.com

SOURCES (REFERRED TO IN ENDNOTES, BELOW)

CRFT Cryonics: Reaching For Tomorrow, Alcor Life Extension Foundation, copyrights 1989, 1991, 1993, 4th Edition, December 1993.

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About The Author

York W. Porter, born in 1952, attended Berea College in Berea, Kentucky for two and a half years and, in the Fall 1974, began working in a rural Kentucky hospital in the Department of Radiology. Diversifying through the years, Mr. Porter worked for one year on an ambulance crew and spent several years in a hospital laboratory setting, plus about a year doing respiratory therapy work. He has worked fairly continuously in the field of medical radiography, working as a staff tech at various times in four rural Kentucky hospitals, primarily in the fields of general radiography and computed tomography. He also has worked in the past, on rare occasions, at a Magnetic Resonance Imaging (MRI) center. He is the President of the Immortalist Society, at the time of this writing, and serves also as the Executive Editor of *Long Life* Magazine, the "house publication" of the Immortalist Society.

Advanced Neural Biosciences in 2017

Chana Phaedra/Aschwin de Wolf

Introduction by York W. Porter, President, Immortalist Society

Advanced Neural Biosciences is a company originated by Chana Phaedra and Aschwin de Wolf. Both are dedicated cryonicists of high ethical standards who have worked for the past several years in trying to study and improve all aspects of the fundamental procedures used in placing individuals in storage at cryogenic temperatures. While it is entirely possible/probable that future nanotechnology will be quite advanced, one wants to place as little burden as need be on any future science and technology. No one has a "crystal ball" capable of reading future scientific capability and cryonics, like any other technological endeavor, must base itself on the hard evidence that only comes from experience and from scientific study.

It is with great pride that we can say that, although one can see from the report below that ANB now receives support from several places, the initial funding which helped to "jump start" this fine organization into existence came from the Immortalist Society. Funding received from Immortalist Society research donors still continues to fund some of the ANB research work directly relevant to cryonics and it is hoped by both ANB and IS that their productive relationship will continue for years and years to come.

Advanced Neural Biosciences completed the year of 2016 with a comprehensive screening of pre- and post-mortem administration of stabilization medications in collaboration with the *Alcor Life Extension Foundation*. A general treatment of our findings and its specific relevance for the *Cryonics Institute* will be published in the next issues of this magazine. In short, we have established that prompt administration of citrate and heparin are the two most important pharmacological interventions to improve cryoprotective perfusion. While the use of heparin is well established in cryonics, the remarkable potency of citrate is less known. As the duration of time after cardiac arrest increases, however, the efficacy of these medications decreases and administration within 15 minutes of cardiac arrest is a key to their optimal usage.

Cryoprotectants can eliminate ice formation in the brain but in "good" conditions this often produces severe shrinking of the brain. Most of the cryoprotectants we use today (including glycerol and CI's vitrification solution, VM-1) have poor blood brain barrier (BBB) penetration. In our lab we have found cryoprotectants that do seem to cross the BBB, but is there a price to pay in terms of viability? In other words, do some cryoprotectants cross the BBB because their higher toxicity damages the BBB? Are there cryoprotectants that can penetrate the BBB and have low toxicity in hippocampal brain slices, too? Thanks to funding of the *Life Extension Foundation (LEF)*, we have obtained a much better understanding of this and seek to incorporate these findings in new cryoprotectant loading and unloading protocols.

Is a cryoprotection protocol that prevents cerebral dehydration necessary to preserve the fine ultrastructure of the brain (or at least to make it visible with an electron microscope)? We expect to answer this question later this year as we screen a number of different cryopreservation and chemical fixation protocols to produce the best electron micrographs of VM-1 to date. We hope to report our progress in an upcoming review paper about cryopreservation of the mammalian brain, which will incorporate a lot of the work that has been funded by the *Immortalist Society* to date.

We are putting the final touches on an ambitious paper documenting the histological changes in the brain after prolonged periods of normothermic and hypothermic circulatory arrest. In this paper we will also introduce the use of deep learning algorithms to distinguish between different ischemic time intervals by looking at the ischemic brain images alone. Our results will be discussed in a broader medico-philosophical context, including its relevance for human cryopreservation.

Introduction of CI's vitrification solution VM-1 to the rest of the body is at times compromised due to abdominal swelling. In a series of experiments (that builds on earlier work we have done for the *Immortalist Society*) we have conducted in 2016 we have identified that in a number of select cases this can be avoided by a basic change in protocol, on which we will report soon in this magazine.

In terms of technological advances, we have upgraded our perfusion and data collection set-up in collaboration with *Oregon Cryonics*. Our software now allows for automatic collection of data (temperature, pressure etc.) and control of perfusion pumps. We have also started work on a temperature-controlled perfusion enclosure that will enable us to conduct cryoprotective perfusion below zero degrees Celsius.

Final note by York W. Porter, Immortalist Society President:

As indicated in this report, there has begun a series in this magazine, with the first installment in the first quarter issue, in which information about various aspects of the cryonics process will be discussed with a eye towards practical and research based improvements in that process The next installment should appear in the next issue. Stay tuned!.

A Look At An International Viewpoint

Introduction by York W. Porter, Immortalist Society President

Many times the pages of Long Life, and other cryonics related writings, concentrate much on viewpoints from inside the USA. This is probably due in part to the fact that the two largest providers of cryonics services exist in the USA, that Robert Ettinger, the "father of cryonics", was a USA citizen, and that much of the original work and efforts involving the field of cryonics were carried out in the United States.

In the following article, reprinted with permission from Cryonics News, Dr. Jose Luis Cordeiro expounds on aging, cryonics, and immortality and does so with an "international flavor" to his writings. We welcome Dr. Cordeiro to the pages of Long Life magazine and are hopeful that the publication of his article here, while his first in this magazine, won't be his last

Immortality and Plan B: Cryopreservation

Aging, Cryonics, Immortality

Dr. Jose Luis Cordeiro

Thanks to exponential technological advances, we might be able to stop aging processes by the middle of this century. Indeed, it is possible that in just two, three or four decades, we will be able to extend lifespans indefinitely. Some scientists are already beginning to discuss that aging is a disease, for the first time in history, but that it is a curable disease. In the meantime, however, we still need a Plan B to try to keep people alive, and that is cryopreservation for those unlucky to die before we can cure aging.

Exponential Technologies and Increasing Longevity

Average human life expectancy has increased radically thanks to medical advances, which are now happening faster and faster, following an exponential increase in human knowledge. Regenerative medicine, stem cell treatments, gene therapies, 3D printing of organs, rejuvenation therapies, telomere lengthening, bioengineering, molecular nanotechnology, anti-aging drugs, therapeutic cloning, tissue regeneration, growth hormone treatments, and other advances, might help to defeat aging in a few decades.

Companies like Google are realizing that curing aging is scientifically possible, and so in 2013 Google created a company called Calico (California Life Company) in order to control, stop and reverse the aging processes. Human Longevity Inc. was created in 2014 by American visionary technologists Peter Diamandis, Robert Hariri and Craig Venter to also understand and cure aging, beginning with the massive sequence of human genomes. Additionally, there are nonprofits dedicated completely to cure and reverse aging, like the Methuselah Foundation and the SENS Research Foundation. Additionally, Joon Yun, a millionaire medical doctor in Silicon Valley created the equivalent of a Nobel Prize for Immortality, with the name of the Palo Alto Longevity Prize and an award of one million dollars.

The proof of concept that indefinite lifespans are truly possible is that they already exist in nature today. Among some lifeforms, both unicellular and multicellular organisms, no senescence has been found. Some single cells are basically immortal, like bacterial colonies that are considered immortal, and since bacteria were the first basic life forms in our planet, we could say that life appeared to live, not to die. Similarly, stem cells and germinal cells can reproduce indefinitely, as long as they have the inputs and nutrition to thrive and reproduce. The same is true about cancer cells, like the famous HeLa cells that can live and multiply indefinitely.Some multicellular organisms like Hydras and some species of Jellyfish do not seem to undergo any senescence and, as such, can potentially be considered to be biologically immortal, as long as they are not eaten or killed. Planarian flatworms appear to regenerate indefinitely and seem to have an apparently limitless telomere regenerative capacity fueled by highly proliferative adult stem cells. Therefore, not just unicellular bacteria and gametes but also some multicellular organisms have a lot to teach about indefinite longevity. They are the living proof that senescence is not a compulsory byproduct of being alive.

Toward Immortality

We might soon reach what I call the "death of death", when death will be basically optional. We might never be completely immortal, since we might always die from accidents, or be killed in many ways, but the objective is to kill involuntary death. Living indefinitely will be possible from both the hardware (biological) side and the software (mental) side.

On the hardware side, English biogerontologist Aubrey de Grey believes that we will soon reach "longevity escape velocity", which basically means that with continuously increasing lifespans, we will be adding more years to our existence for every additional year that we live. This idea has also been called the "Methuselarity" or "Methuselah Singularity". Many experiments are currently being done to extend the life, and also rejuvenate, little mice that actually share a big part of our own genome.

On the software side, American engineer and futurist Ray Kurzweil believes that by 2029 an artificial intelligence will pass the Turing Test, and by 2045 the so-called "Technological Singularity" will be reached. That means that artificial intelligence will reach and surpass human intelligence levels, and we will augment and complement with such additional intelligences. We will then connect our biological neocortex to an artificial exocortex, and we will be able to upload and enhance our minds.

Either through our hardware, our software, or both, we will be able to advance towards the idea of the death of death, at least as much as possible, escaping any accidents and avoiding to be killed.

The Bridge Toward Immortality

As discussed earlier, indefinite lifespans should be possible in a few decades, but what can we do until then? The sad truth is that people will continue dying for the next few years, and the only way that we know today to preserve them relatively well is through cryopreservation. Indeed, cryopreservation can be considered as Plan B until we reach Plan A of indefinite lifespans.

The modern era of cryonics began in 1962 when Michigan physics teacher Robert Ettinger published his book *The Prospect of Immortality*, where he considered that freezing people may be a way to reach future medical technology. Even though freezing a person is apparently fatal, Ettinger argued that what appears to be fatal today may be reversible in the future. He applied the same argument to the process of dying itself, saying that the early stages of clinical death may be reversible in the future. Combining these two ideas, he suggested that freezing recently deceased people may be a way to save lives. Based on those ideas, Ettinger and four other colleagues founded in 1976 the Cryonics Institute near Detroit, Michigan. Their first patient was Ettinger's mother who was cryopreserved in 1977, with her whole body frozen at the boiling temperature of liquid nitrogen (-196 °C).

In the meantime, in California, another cryopreservation institution was founded in 1972 by Fred and Linda Chamberlain with the name of Alcor Life Extension Foundation (originally named Alcor Society for Solid State Hypothermia until 1977). Their first patient was Fred Chamberlain's father in 1976, who underwent a neuropreservation, with only the head being cryopreserved. Alcor eventually moved in 1993 to Scottsdale, Arizona, far away from seismic California, and its current president is English-born philosopher and futurist Max More.

"The science of cryonics is an extension of today's emergency medicine and could very well give humankind another chance at life once technology advances far enough to revive cryonics patients cryopreserved at Alcor" has explained Max More. Many patients elect to freeze just their heads. Some do so for financial reasons; others believe all human identity and memory is stored in the brain and so a whole body will not be necessary.

Cryonics Institute only does full-body cryopreservations, while Alcor does both neuropreservations and full-body cryopreservations. By late 2015, Cryonics Institute had 135 patients under cryopreservation and 1,214 members, while Alcor had 139 patients (of which around three quarters are neuropatients) and 1,221 members. Both institutions also have many frozen tissue/DNA samples, and pets and other animals under cryopreservation. Cryonics Institute charges

US$ 28,000 - US$ 35,000 for full-body cryopreservations (not including the expensive SST costs: Standby/Stabilization/Transport), and Alcor charges US$ 80,000 for neuropreservations and US $200,000 for full-body cryopreservations (normally including all the expensive SST costs).

Even though their patient and membership numbers are still relatively small, Cryonics Institute and Alcor were basically the only two cryopreservation organizations in the world until 2005, when KrioRus was funded outside of Moscow. Additionally, there are currently small groups in Argentina and Oregon that each have just one neuropatient, but those are the exceptions to the rule.

Does Cryonics Work?

No one yet has been revived after been cryopreserved, but that is also because we can't yet cure the conditions that caused the terminal condition at the time. However, thanks to exponential technological advances, it is very likely that we should be able to reanimate the patients in the next few decades. Once again, the proof of concept is that it has already been done with certain living cells.

Water-bears (Tardigrade) are microscopic multicellular organisms that can naturally survive by replacing most of their internal water with the sugar trehalose, preventing it from crystallization that otherwise damages cell membranes. In January 2016, it was announced that a Tardigrade was reanimated in perfect condition after having been frozen at -20 °C for 30 years in Japan.

Several vertebrates also have freeze tolerance, in which organisms survive the winter by freezing solid and ceasing life functions. Some species of frogs, turtles, salamanders, snakes and lizards can survive nominal freezing and recover completely after overwintering in cold climates. Species of bacteria, fungi, plants, fish, insects and amphibians who live near the poles have evolved cryoprotectants that allow them to survive during freezing conditions.

English scientist Janes Lovelock, best known for proposing the Gaia hypothesis about life on Earth, was probably the first person who tried to freeze and reanimate animals. In 1955, Lovelock froze some rats at 0 °C and then reanimated them successfully using microwave diathermy. And just recently DARPA began funding research about suspended animation, essentially "shutting down" the heart and brain until proper care can be administered that can be regarded as a step to cryopreservation of humans.

Eggs, sperm and even embryos are normally cryopreserved today in order to be reanimated later. Frozen eggs and sperm have been used in animal reproduction, and even human embryos have been cryonically suspended and later allowed to develop without any birth or development problems at all. Additionally, blood, umbilical cords, bone marrow, plant seeds and different tissue samples have been frozen and unfrozen successfully.

In terms of memory preservation after freezing, American artist and futurist Natasha Vita-More and Spanish biologist Daniel Barranco recently performed interesting research on the persistence of long-term memory of vitrified and revived nematode worm Caenorhabditis elegans. During 2014 and 2015, they experimented with cryopreserving C. elegans and reanimating them later to test their long-term memories as indicated by odorant imprints. The result was that C. elegans "remembered" their learning acquired through olfactory cues after vitrification and slow freezing. Humans are certainly not worms, but the fact that C elegans could still recognize learned olfactory signals after cryopreservation, is an important indication of what can be possible.

Cryopreserved people might someday soon be recovered by using highly advanced technologies. More and more scientific literature supports the feasibility of cryonics. An open letter supporting the idea of cryonics has been signed by many prestigious scientists until now, including Aubrey de Grey and American scientist Marvin Minsky, considered one of the "fathers" of artificial intelligence. In 2015, a group of scientists from Liverpool, Cambridge and Oxford, established the UK Cryonics and Cryopreservation Research Network to advance and promote research into cryobiology and its applications, including cryonics. Thus, more and more people around the world are beginning to consider that successful human cryopreservation is indeed possible, particularly because the proof of concept is already available.

From Russia with Love: My Visit to KrioRus

People familiar with cryonics are normally acquainted with the two major cryopreservation facilities in the USA: Cryonics Institute near Detroit, Michigan, and Alcor in Scottsdale, Arizona. But in 2005 a new organization was created outside of Moscow, Russia, by Russian futurist Danila Medvedev.

I first met Medvedev in 2005, when he came to Venezuela for a transhumanist conference that I organized called TransVision 2005. The main speaker of that conference was Sir Arthur C. Clarke, famous science fiction writer who wrote about cryonics in his bestsellers, like Space Odyssey 2001. Clarke could not come to Venezuela because of his physical condition, but we had a wonderful teleconference. Other speakers at TransVision 2005 included Natasha Vita-More, Max More, biophysicist Gregory Stock, entrepreneur Martine Rothblatt, futurist Jerome Glenn, and many other visionaries. Medvedev spoke

there about his plans to create the first cryopreservation facility outside of the USA, which he did after returning to Russia.In November 2015, I visited Medvedev and KrioRus. The current facilities are located in Sergiyev Posad, a beautiful old city about 70 km northeast of Moscow. Sergiyev Posad is very famous as a religious and tourist destination, and contains one of the greatest of Russian monasteries, the Trinity Lavra established by St. Sergius of Radonezh in the 14th century. Thus, Sergiyev Posad has been a very appropriate location for cryopreservation as a traditional resting place for saints and monarchs. However, KrioRus is already outgrowing its current facilities and is planning to move to another nearby location also north of Moscow, where there will also be a hospice and additional facilities for terminal patients, next to the cryopreservation facilities with more research capabilities.

Danila Medvedev and José Luis Cordeiro at KrioRus in Sergiyev Posad

The growth of KrioRus has been spectacular compared to the older and larger Alcor and Cryonics Institute. In just one decade, KrioRus has managed to cryopreserve 50 humans, 8 dogs, 7 cats, 3 birds, and 1 chinchilla rodent, all until December 2015. Their first patient was Lidiya Fedorenko in 2005, who was originally cryosuspended with dry ice for several months until the first cryostat container was ready. Medvedev's grandmother is one of those under neuropreservation. Like Cryonics Institute, KrioRus uses cryostats, which are large thermos containers made of fiberglass/resin filled with liquid nitrogen, as opposed to the more expensive individual Dewar flasks used by Alcor. All the patients, pets and tissues cryopreserved in KrioRus are stored in two large cryostats specially designed by KrioRus, which has gained enough experience to build new ones needed for their next larger facilities.

KrioRus charges US$ 12,000 for neuropreservations and US$ 36,000 for full-body cryopreservations, without considering any large Standby/Stabilization/Transport costs, which have to be considered separately. Animal and tissue cryopreservations are cheaper depending on the size and special conditions. In the past decade, they have managed to attract patients not only from Russia, but also from many other countries around Europe, like Italy, the Netherlands and Switzerland, and much farther away like Australia, Japan and the USA. Just like the case with Alcor, more than half the patients are neuropreservations.

The relatively fast growth of KrioRus indicates that good and economic services can help to popularize cryopreservation. Even if many people might still think that cryonics might be just science fiction, we might remember the very famous three Laws of the Future by Sir Arthur C. Clarke:

1. When a distinguished but elderly scientist states that something is possible, he is almost certainly right. When he states that something is impossible, he is very probably wrong.
2. The only way of discovering the limits of the possible is to venture a little way past them into the impossible.
3. Any sufficiently advanced technology is indistinguishable from magic.

From Spain with Live: The Birth of Cryopreservation in Madrid

I am currently involved in the creation of the fourth cryopreservation facility in the world, after the older two in the USA, and the newer one in Russia. Together with famous Spanish economist Ramón Tamames, member of the Royal Academy of Political and Moral Sciences, José Luis Mazuelas, president of the VidaPlus Foundation for umbilical cords cryopreservation, and Felipe Debasa Navalpotro, lawyer and historian at Universidad Rey Juan Carlos, we are creating a foundation to promote cryopreservation in Spain. Furthermore, Ramón Tamames has agreed to be cryonically suspended when the time comes.

continues on p33

Kent Cullers: A Visionary without Vision

By Benjamin Medlen

Introduction

One of the goals of Long Life magazine and most other general interest cryonics publications, for that matter, is to create a sense of community. Members, especially new members, often ask about their fellow time travelers. Members know of their own uniqueness that lead to their choices of the prospect of extended life, but what of the others in this unique community?

One of the most interesting and accomplished of these fellow time travelers is Kent Cullers, PhD. For a number of years, Kent served as a governor of the American Cryonics Society and a supporter of TransTime Inc, (a cryonics service company). Kent is among the to-be-frozen-few who required simply the idea of cryonics to prompt them to sign up. He is now living at a rest home in Hawaii. He expects to become a patient at the Cryonics Institute sometime in the future where his first wife Carol is among the current patients.

The following article is by Benjamin Medlen, an administrative assistant to the American Cryonics Society and was originally part of a class project. The article is based upon an interview with Dr. Cullers of 2014 when Kent was living in Sunnyvale, California. In 1996 Kent was the first recipient of the prestigious Bruno Memorial Award.

When asked what was the funniest thing that happened to him, Kent Cullers replied "I was in college, relatively poor, at my dorm room. The doorbell rang, and I went to answer it. I said 'Yes?'. There was complete silence. And then my girlfriend came up behind me and she started laughing. I asked why, and later she told me that the silent visitor had holding up a sign asking for donations for the Association for the Deaf. I couldn't see it, and once we all realized why she was laughing, we were all laughing."

He clarified, saying "It was a perfect example of some of the Berkeley goofiness that went on. Students misunderstanding and miscommunicating."

Kent Cullers, age sixty-four, is the world's first (and perhaps still only) blind astrophysicist. "Maybe there have been some more since I've left the field, but I was the first," Cullers jested.

Cullers holds a PhD in the subject of experimental physics, as well as a Bachelor's in psychology. Most of his education was completed at the University of Berkeley in California. He is best known for being a team leader for SETI (The Search for Extraterrestrial Intelligence), up until about 2004 when he went into retirement. Culler was also confidante of the late Carl Sagan, and his person was portrayed by actor

William Fichtner in the 1997 film *Contact*, which starred Jodie Foster and Matthew McConaughey.

Birth and Youth

Kent Cullers was born in El Reno, Oklahoma on July 21st. "During the late 1960s, there was a peak in the number of blind babies due to the popularity of incubators on premature infants at the time." Cullers was not born with his blindness, it was inflicted upon him due to a fault in the incubating chamber; excess oxygen dried out his eyes and permanently damaged them. "The popularity created a huge explosion of opportunities for the blind due to that fact."

While he was still in grade school, Culler's father once read to him The Golden Book of Astronomy, and it was from age of five he decided he wanted to become an astronomer and a physicist. Later in school he left his interest in physics to go on to astrophysics. Cullers also had many magic thoughts about becoming an English major, but physics was where his heart was.

Education

Cullers made experimental physics his field of study because "you have to understand physics to understand fundamental aspects of the universe. I got interested in it at the right time. My contributions were strides in what was basically coding theory, though it wasn't called that at the time."

In high school, he had a best friend, Charlie Golden "who is now a big shot in psychology" and went to the same college as Cullers, Pomona College. "We did different things. I did hard science, and he did soft science. If we would write a triplicate term paper. I would write ten pages, and he would write 150 pages. A prolific writer." Cullers and Golden went to different graduate schools; Golden attending the University of Hawaii, but still keeping in contact.

Also in high school, Cullers had one particular professor who did interesting experiments in chemistry and physics. "He would put together a couple of things that were colorless and drop them into a vat of solution, and they would change color. He would then ask 'Why do you think that occurred?' After hearing many novel answers, he would then admit 'Actually while you all weren't looking, I just dropped some food dye into the vat and that's why it's colored.'"

There was also Jim Stevenson, who was also a blind scientist but one that pursued statistics. "He was more mathematically inclined than my friend Charlie. In Temple City, California, about 1% of the population would be blind. so at school, there would typically be a room where we could all go to pick up books and lecture notes in Braille, get translation or have them transcribed into Braille. So I met him that way. He was a senior and I was a freshmen and we still kept in touch over the years. He got a Post-Doctorate in Statistics. Though recently Jim died."

'How?' you may ask.

"He could drink a fifth of vodka as part of an evening recreation every day," Cullers replied. "I was very impressed at the time. I could drink a fifth of vodka, but I would make less sense than him."

"Jim", the blind friend Kent reefers to in this article is James Stevenson, PhD who worked at the NASA institute located at the Ames Research Center in Mountain View, CA at the same time Kent was a director of SETI. At that time, SETI, was a division of NASA, also based at Ames. Dr. Stevenson was an experimental psychologist in the Human Systems Integration division. Jim Stevenson was cryopreserved in late November of 2010 by the Alcor Life Extension Foundation. Jim died of cancer after entering the hospital with abdominal pain. Apparently Kent believed that Jim's past prestigious drinking contributed to his demise.

The young student had some excellent teachers at Pomona college. "The professor to student ratio was very good; ten students to an average class. The best teachers were the hard ones. The best physics teacher there, Jack Miller, gave him a problem to do every day called the Daily Integral. And even though Cullers knew advanced calculus, he would only get 20 out of 40 of the problems correct. "By doing this, Miller taught that you could learn a lot from the problems that you couldn't solve, and focus on the ones you could. It made me want to do research. If there was an utterly impossible problem, you could leave it to the next genius to solve it. It was much better training for life experience than anything."

Career at SETI

Before embarking on his career, Cullers only did a few summer jobs in high school, assembling computer piece parts. Most of his money came from scholarships that got him through college, though he was also paid as a teaching assistant, and did monitoring of weather experiments for the National Science Foundation.

Cullers acted as a team leader and major organizer of ideas, helping to design radio antennae that could act as a single unit, as well new signal detection techniques "that were unique, so we could find very weak signals. This was some of my most gratifying work. I developed a lot of algorithms for detecting the very weakest possible signals." Useful techniques when one is searching the background noise of the cosmos for possible intelligent life.

One of the things he did as team leader was be what is called an organizer of studies. "Working with people, bringing their separate ideas together, developing my own research, and building the antennas were equally exciting," Cullers says. He did work in Alaska, studying the ionosphere, and new techniques involving radar and signal-detection, "so I could find very weak signals."

"The most challenging aspect was funding. We got a bunch of funding in the 1990s, because one of the great scientists by the name of Bernard Oliver passed away. He had worked with Hewlett-Packard, and contributed twenty million dollars to the SETI institute. He was a very smart guy in many things like helping to develop the HP 85 calculator and its descendants."

When most people think of astronomy, they may think of telescopes like the famous Hubble, taking photographs of stellar phenomena. While this is visually striking, it pales in comparison to the radio telescope and its ability to listen rather than see.

"At the time we developed a system of antennas that were linked so that their signals would add systematically, and act as a single antenna."

Family Life

Culler's first love was Carrol Dolson, who later became Carrol Cullers. He met her at the age of twelve during a school debate, and he was very impressed by her arguments. He knew her for thirty years and was married to her for twenty of them. "Some of my happiest moments were of Carol. She was a remarkable lady. She read to me a vast amount of time every day. She would read and I would talk, and we would have a constant conversation throughout our married life -- a tremendous flow of information back and forth."

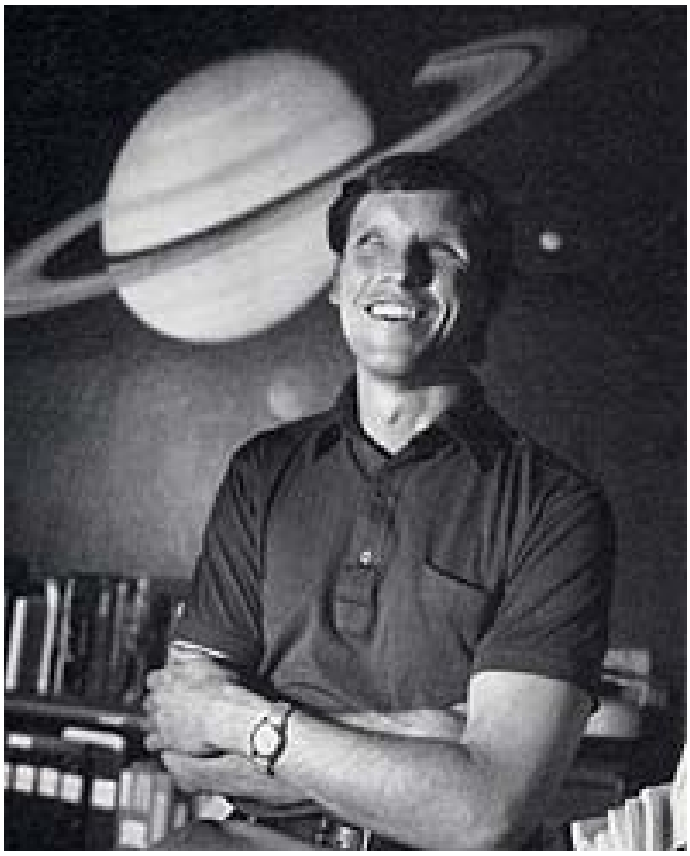
And then she died from e.coli meningitis.

"It was...peculiar. She and I were both surprised. She went from a headache on Saturday to dead on Tuesday. It was most astonishing. She went from perfect health to death from an infection that escapes from the intestines. Usually it escapes into the blood, you get a fever, and take some antibiotics, but this one got into the spinal column before the antibiotics could work."

From his marriage, Cullers had two children, Alan and Maria. Both are grown up, and pursuing different education goals, engineering and psychology, respectively.

Witnessing of History

The most significant political event for Cullers was the collapse of the Soviet Union."I knew many people from the Soviet Union. There was other scientists interested in the same things as I living there,



and I had some correspondence with them. People were traveling to escape to freedom in case it was taken away. Communism was such a major force, and then it was disrupted, and now seemingly ceased to exist. It seemed so easy to believe once that the world was divided fifty-fifty." Cullers believes that true freedom came not from the fall of dictatorships, but rather from the information revolution; the free-flow of ideas. "If more people know what is happening, then they have a choice now to accept or reject them. If you've got computers, information can come in a lot of ways."

Carl Sagan and the film *Contact*

Kent Cullers met the author of the book *Contact*, Carl Sagan. "He was a very interesting guy. I met him at several city conferences. The first time I met him I gave him a lecture, and ever since then I would go to a conference where he was lecturing and he would contact me to say that he was still watching my career."

Cullers greatly admired Sagan's *Cosmos* miniseries. "He did a great job in summarizing "Life, the Universe and Everything" in ten parts. That was extremely impressive. And I don't think we've had his like since. He had many eccentricities, but I thought he was a great communicator. He asked me once details about what a signal would be

like, and I didn't know he was writing a book at the time."

When asked how accurate Sagan's description of the signal was. "A booming voice from the sky? No. The idea of Jodie Foster actually hearing the signal on her headphones is absurd. The signal would never be strong enough. Unless we were extremely lucky, and if that's the case, the UFOs would have been here already. And once we've detected it, decoding the detected signal would be something altogether."

The film was released in 1997, and Cullers got to talk to the original director of the movie, George Miller, who was replaced by Robert Zemeckis. "Miller was interested because he was fascinated by how blind people do science. Carl was so influenced by me, that a character was created for the film called 'Kent.' "

"William Fichtner is a good guy. I met him at the premiere, and he introduced me to Jodie Foster. He played me well enough that even people who knew me thought that it was me. *Contact* was fun."

By pure coincidence just when the film was coming out, a pseudo-signal was detected in 1997. "You detect signals all the time, and you have know all the time if it's a signal from a place you think it's from because we're looking for signals that are ten million times weaker than the noise of a 10 megahertz band. There are a lot of noises from Earth that can leak into a telescope that can mess up viewing. So you have to know if the signal is coming from the place you think it's from. We spent time looking at a signal that appeared to be real. We didn't announce it, though we were contacted by the New York Times. Since the movie was coming out, the people making it would have loved to have a signal detected. The PR guy at the SETI institute. said 'Don't call us. If there's a signal, then we'll call you."

While the signal turned out to be a signal from a solar-orbiting satellite, the incident was still immensely exciting for Cullers' co-workers. "I was proud of the group. We are excited. We had our cameras out, hoping this would be the Event. But we never announced it. Regretfully, we haven't found a signal yet, but on the other hand we also haven't announced any false alarms."

Cullers clarified. "We have a vast search, but if the potential signals are grains of sands on all the beaches of the world, we've examined precisely one quart of sand, so the search compared to the possibility of search is still intensely small. We could get lucky but we haven't. With our current level of technology, we could send a rocket to the nearest star, but it would take about 40,000 years to get there. We could develop electrically powered rockets -- ion powered -- that would travel much faster, but we haven't developed the technology for interstellar travel in a systematic manner."

Life After SETI

After retiring from SETI, Cullers traveled the world. "New Zealand is very beautiful. We own a house in Christchurch. A great view when the fog isn't in."

He mainly stayed in South Africa, a nation that says "should by rights have disintegrated, but hasn't due to the efforts of Nelson Mandela. They seem to be evolving, instead of disintegrating. I have a lot of friends. It is a very interesting country."

One particularly memorable incident occurred in South Africa where Cullers acted to save the life of a woman he befriended there. "The medical situation in South Africa is fairly complicated. If you don't have money, you don't get medical treatment. She developed breast cancer and she was the sole support of her family. So I came and spent time with her, and gave her a few thousand dollars so she get an operation and have some comforts in life, everything from a refrigerator and an electric blanket. Unfortunately I had to leave, so I don't know if everything worked out. But it was a very pleasant situation. I was very happy to help them. The woman was close to my age, and her daughter was close to age of my own daughter."

He briefly came back from the United States from South Africa just to vote for Barack Obama in the 2008 presidential elections. "I think he's pretty good. Obama, Clinton, and if you think I only like democrats, I thought Eisenhower was pretty good. After all, he was a general and he was a pretty good leader."

The Possibility of First Contact

When asked on a purely hypothetical situation -- the best case scenario -- where communication is established with an extraterrestrial civilization, and assuming that things like translation barriers are overcome -- what would be the first thing to say to them, Cullers responded by saying "Message received. Are you aware of any other civilizations?" They may be much further along in their search. Once you know where the signal is coming from, the data rate goes up. If you send an omnidirectional signal, it goes everywhere, but in a two way signal, no energy is wasted, and a line of communication could be established with a simple language constructed."

Future and the Square-Kilometer Array

Nowadays he can be found listening to his audio-dramas of which he has an extensive collection. "I mainly enjoy British mysteries, science-fiction and comedies. It keeps my mind occupied, and my sense of humor sharp."

continues on p33

We Need Your Views!!

Melanie Swan, noted futurist and a long time supporter of cryonics, is asking everyone in the Cryonics Community to participate in a survey about cryonics. In order to participate, please go to, as soon as you reasonably can, to the following web address and help Ms. Swan in her efforts to promote cryonics:

https://docs.google.com/forms/d/1UjyNoc_6Lmmo7o796_cxrWXcfzuX6-XwWB3j-49edUM/

Please note that the results will be gathered on an anonymous basis and will be used in an accepted paper in the Springer journal Sophia Special journal issue: "Posthuman and Transhuman Bodies in Religion and Spirituality". The aim is to promote cryonics in a scholarly manner and to articulate community members' thoughts on this excellent subject. Any questions please write to Melanie by using the e-mail address of m@melanieswan.com.

For a little more background on Melanie, please note that she is a Philosopher and Economic Theorist at the New School for Social Research in New York, NY. She is the founder of several startups including the Institute for Blockchain Studies, DIYgenomics, GroupPurchase, and the MS Futures Group. Ms. Swan's educational background includes an MBA in Finance from the Wharton School of the University of Pennsylvania, an MA in Contemporary Continental Philosophy from the Centre for Research in Modern European Philosophy at Kingston University London and Université Paris 8, and a BA in French and Economics from Georgetown University. She is a faculty member at Singularity University and the University of the Commons, an Affiliate Scholar at the Institute for Ethics and Emerging Technologies, and an invited contributor to the Edge's Annual Essay Question.

Ms. Swan enjoys creating new solutions for how we do things in the world. Her career has focused on academic research, finance, and entrepreneurship. She served as Director of Research at Telecoms Consultancy Ovum RHK, and previously held management and finance positions at iPass in Silicon Valley, J.P. Morgan in New York, Fidelity in Boston, and Arthur Andersen in Los Angeles.

Ms. Swan serves as an advisor in academic, government, corporate, and startup settings, and is active in the community promoting science and technology opportunities. She is a hackathon participant and designs collaboration simulations including "Discontinuity Futures," "Being an Entrepreneur" and "The Trader's Pit." Ms. Swan is an Advisory Board member of the Foundational Questions Institute, Lifeboat Foundation, and Accelerating Studies Foundation, the former Treasurer of San Francisco-based non-profit Equal Rights Advocates, and a workshop presenter at the Expanding Your Horizons math and science conference. Ms. Swan speaks French, Spanish, and Portuguese, and enjoys reading, international travel, running, meditation, and kick-boxing.

Robert Ettinger:
The Legacy Continues

Introduction by York W. Porter, President of the Immortalist Society and Executive Editor of Long Life Magazine

Looking Back:
Robert Ettinger And an Early Glimpse of "Youniverse"

Robert Ettinger on Rossman's Non-Self-Centered Self

Robert Ettinger wrote extensively during his lifetime about all aspects of cryonics. The length and breadth of his thinking about the field he is basically responsible for launching still continues to amaze me. He dealt with numerous subjects from the "nuts and bolts" of cryonics to investments to philosophy to political viewpoints and other subjects as well. In this article from October of 1991, he gives a glimpse of his book Youniverse. Like his seminal work, The Prospect of Immortality and Man Into Superman before it, as well as any other book worthy of reading, Youniverse didn't just "spring to life" one day after a moment or two of thinking. (Although, given my time around Mr. Ettinger and finding him to be one of the, if not the most intelligent person I've ever been around, it wouldn't have surprised me if it had). Robert Ettinger spent a great deal of time thinking about his viewpoints and thinking carefully about what he wanted to say. In this offering one gets a small glimpse of Ettinger's thinking as it would underlie his future and final book offering.

Rossman's Non-Self-Centered Self
By: R.C.W. Ettinger

Some of our readers know that one of my continuing projects is a book with the working title of *Youniverse: Toward A Self-Centered Philosophy.* It is not a philosophy of self-indulgence or hoggishness, nor of disregard for others, and its successful application requires extraordinary effort and discipline. At the same time it does, as the title suggests, put looking out for number one at the top of the agenda. (And believe me it does require book length treatment, at a minimum, to clarify and reconcile these statements and to provide a new and liberating world-view)

Comes now (1991) Neil Rossman, a professor at F.H. LaGuardia College, with a book called *Consciousness: Separation and Integration*, published by the State University of New York Press, Albany. He recognizes the self as an aspect of brain activities, and tries to put it in an evolutionary context. Most of what he says about the biology seems to me sound enough, although not necessarily especially useful. But when he draws psychological/metaphysical conclusions I believe he jumps completely off the rails.

The following excerpt, near the end, is reasonably accessible, even without the preceding bulk of the book:

> The contemporary preoccupation with the existence or non-existence of God tends to obscure and distort the more fundamental and significant problem. However, the deeper problem—separation from the life process out of which self emerges—has been recognized in a variety of contexts and traditions. In the midst of such separation, one is severed from the ground of one's being and so also the standpoint within which one can create a meaningful, fulfilled life. As a result of such severance, the private self is assigned the status of ultimacy and basic reality. This has dire consequences since it distorts the nature and place of self and so creates an imbalance between self and not-self, i.e., others and the world. In a word, it miscalculates the place of and the importance of self and sets the distorted and fantastic interests of the misconceived self over and above the life process and all its other manifestations.

Let's look for a moment at the term "ground of being". I have said that the "self circuit" is the ground of being, the self-circuit being that portion or aspect of the brain or its functions that constitutes the seat of feeling, hence of consciousness and LAWKI (life as we know it). I believe this is almost self-evident, almost true by definition. In one sense, Rossman agrees since he characterizes the self, in biological terms, in a somewhat similar way, as an aspect of certain brain functions. But he reserves the term "ground of being" for use in a psychological and almost theological sense: Because our lives arise from life in general, and because mental health depends (in part!) on our psychic connections to other people and to the greater world, these connections constitute our (psychological) ground of being.

Part of his problem is that he is not really presenting evidence and drawing conclusions, but merely making assertions—moderately plausible assertions in some cases, but in the end just parroting of the conventional wisdom.

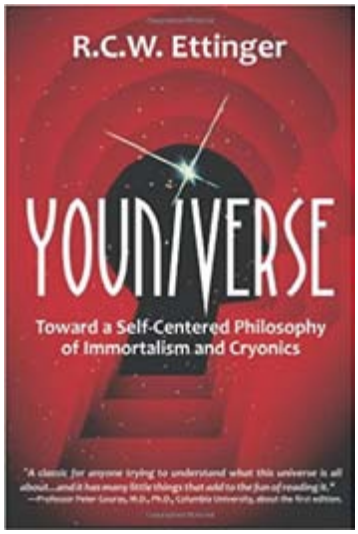
He rejects the "ultimacy and basic reality" of the "private self." ("Private" here is just a pejorative; I don't think he anywhere mentions any public self.) But all this little charade means is that he believes it is safer and more comfortable to take a "non-self-centered" viewpoint, viz., that what is "important" is something other than what happens to you.

This is not biology, or science at all; it is just pop psychology. In effect, it blithely advocates self-deception.

The basic fact of physiological psychology is that nothing is "important" unless it is important to you. Being "important" to you means producing certain physiological states in your brain. Now of course it is true that there are many kinds and degrees of importance, and it is easy to be fooled or to make a mistake; but the rock-bottom necessity of honest thinking is to recognize that what you want is what you want, which may or may not coincide with what someone else wants—or, for that matter, with what you wanted yesterday or may want tomorrow or may even want right now in some hidden fact of your personality.

The topic is exceedingly subtle and complex, with many layers of feedback, and feedforth. One of the dizzying complications—and here Rossman may have helped a bit—is that the self is not necessarily monolithic, but may have its own contentious aspects or even subdivisions. One of the topics I am gradually exploring (and which many people have previous suggested in one form or another) is the possibility of deliberately, gradually remaking oneself into a multiplied or distributed person, which would greatly change the rules of the game. The investigation of time is also of crucial importance, and could eventually upset the whole applecart.

But for now the only sensible working assumption is that we exist as individuals, one per skull. The only thing that matters directly—or that can matter directly—is what goes on inside that skull. Prof. Rossman clearly believes this postulate is not compatible with mental health. I disagree.



For more of Robert Ettinger's viewpoint on this and a number of other topics, you can purchase Youniverse online from various suppliers.

Kent Cullers - Continued from p29

He has written some papers on experimental and theoretical topics since retiring, and he still desires to travel to South Africa once again to contribute to the African component of the Kilometer Array that is scheduled to begin construction in 2018, with major funding coming from the European Union.

"It is the largest radio antennae in the world. Basically it will act to combine the signals from many thousands of antennae to act as a single one, and enable us to listen far further than any time in the past." Astronomers expect to be able to map over a billion galaxies on the other side of the universe by using the Array.

Message to Others

When asked what advice he would give to others with his condition who might be thinking of pursuing a career in science and technology, Cullers says simply this.

"Do your S&M -- and that doesn't mean Sadomasochism (science and mathematics). Science won't progress if you don't understand math, and if you understand math, you can develop algorithms. Math is the language of science, and while most rely on computers, we're approaching the physical limits of what computers can do."

Immortality and Plan B - Continued from p25

The emphasis will not only be Spain but also all of Europe. The original facility will be in Madrid, in collaboration with the VidaPlus Foundation, with easy and convenient access to different parts of Spain and other members of the European Union, which have many similar rules concerning mortuary procedures.

Spain has the additional advantage of having had for almost a century insurance for decease, which can be used to cover cryopreservation. This was later spread to other European countries, but not all European Union members created such decease insurance that could help now to pay for a cryonic suspension.

Just like the state of Florida in North America, Spain serves as a summer or permanent residence for older and retired people from all over Europe and beyond. Thus, Madrid, as the capital of Spain, is a very centric and appropriate place for having a major cryopreservation facility. Based on the rapid growth of KrioRus, it is expected that the same might be replicated and augmented in Spain.

Time will tell, but cryonics is an idea whose time has come, and Madrid is ready to welcome cryopatients from all over the world. Madrid used to be called the capital of the "Empire where the Sun never sets", and now it can become the capital where life never sets. Spain is the Kingdom of "plus ultra", and cryonics is a great opportunity for Spain and the world to go "further beyond".

Once again, life appeared to live, not to die. We will probably be able to cure aging by the middle of this century, so let's declare war to aging to move faster, but cryonics is Plan B in the meantime. We already have the proofs of concept that indefinite lifespans are possible, and that cryonics is possible too. We now need more scientific breakthroughs to solve some technical problems, since we know that it should be possible, and the sooner, the better for humanity. Every human loss is a tragedy, certainly a personal tragedy, and we can stop it. While we wait for the death of death, while we wait for indefinite lifespans: Long life to cryopreservation!

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Final Thoughts

York W. Porter - Executive Editor

Olga and Pearl...

I grew up in a small town in the hills of Virginia. It was a delightful place where neighbor knew neighbor and help for any type of trouble was just a short distance away. I remember with great fondness the years of my youth and the number of helpful and kindhearted people that I encountered on a day-to-day basis back in those times.

But, like the stirrings of many youths, I yearned for something more. The magic of television and the local movie theatre had made me aware of bigger, larger, and more bustling places than the sleepy town I lived in back in those days. In the long run, of course, I found out that "bigger isn't necessarily better" and "bustling" doesn't always mean progress. I've now reached the point where the "slow and sleepy life" suits me just fine, especially in this day of e-mail, the Internet, and overnight shipment of just about any item one could wish for either direct to your door or to your post office box. I still remember back in my younger days, however, when coming home from college how I would wonder to myself how anyone could stand to live in what I disdainfully and very, very stupidly thought of as "a one horse town". Now I thank God for the existence of towns such as I grew up in as islands of peace and quiet among the hustle and bustle of every day life.

The lure of the big city hasn't, of course, been limited to myself. Even the days of World War One produced the song "How Are You Going To Keep Them Down on The Farm (After They've Seen Paree)?" which alluded, of course, to the thousands of farm boys who had been exposed to the bright lights and cosmopolitan way of the capital city of France. I suppose it's just human nature to think, "The grass is greener on the other side of the fence".

And so it probably was in the days just after World War II for one Pearl Lusk. She came from Quakerstown, Pennsylvania, which had a population just a little over five thousand people back in 1940. Although just around 30 miles from the larger city of Philadelphia, Pearl Lusk decided she would move to the one of the largest metropolises on the planet, the "Big Apple" itself to seek her fortune. She arrived in the city of New York back in the Fall of 1946 after graduating from high school that same year. The days of World War II, while of very recent memory, were behind the nation and the beginning of the post-war economic boom was beginning to gather steam throughout the land. Living with her mother and stepfather in Brooklyn, she secured employment at a department store and made many new friends.

Being well brought up, she refused to date any young man to whom she hadn't been properly introduced. One day, however, she almost succumbed to temptation as a man who identified himself as a Mr. Allen La Rue met her by what seemed to be total accident on the subway. Chatting with him in her friendly manner, she nevertheless refused to go out with him socially since she didn't know anything about him other than what he had told her himself.

A month or so later, however, life in the big city hadn't turned out as well as Pearl had thought. The department store at which she worked laid her off on Christmas Eve since the need for herself and numbers of her co-workers who were now her friends had gone away since the Christmas shopping season was over. On top of that, being in the days well before cell phones, Pearl was dependent for her social contacts on the landlady's telephone in the place where she rented a room. The landlady, having grown tired of having to go get Pearl Lusk for numerous summons to the telephone, told the young woman she would now only summon her to the phone if the young lady's mother were to call. This, of course, put a considerable crimp in what was a fairly busy social life.

Thus isolated and out of a job, the reappearance of Mr. La Rue seemed most fortuitous indeed. Running into him a second time on the subway, he asked Pearl out for a drink to which she gladly accepted and they spent time talking during which Pearl let him know about the loss of her job and the situation with her landlady. Being

exceptionally handsome in Pearl's eyes, it must have seemed like manna from heaven when Mr. La Rue offered her a job. By the end of the conversation, she was calling him Allen and he was referring to her as Pearl. Things seemed to be looking up after the recent bad news.


'CAMERA' INSIDE THIS PACKAGE TURNED OUT TO BE A GUN

GIRL 'DETECTIVE' WHO TRIED TO TAKE WOMAN'S PICTURE WITH A GUN

Philadelphia Inquirer - Jan 1, 1947

La Rue explained to her that he worked as a private detective and that there was a woman named Olga who was strongly suspected of stealing jewelry but that he couldn't follow her himself as she knew him. He asked Pearl to do so. Showing her a photograph of Olga, he also had her to go to the place where Olga worked and ask the receptionist there for a fictitious employee. While she was there she was to memorize Olga's appearance by studying Olga who sat in the vicinity of the receptionist. On top of that, Pearl was to follow Olga after she got off work to make sure Pearl could easily identify the suspected jewel thief in the future.

Meeting Allen La Rue the next day, Pearl was given what La Rue described as an "x-ray camera" and told to get as close as she could to Olga without being noticed and then to pull a loop of wire sticking out of a box in order to take the picture which was supposed to show the jewelry on Olga's person thus making the thief's identification and arrest a sure thing.

Pearl dutifully followed instructions and after returning the camera unopened to La Rue, as instructed, she waited till the next day. He then told Pearl there had been a problem and that the film hadn't developed and that he would have to get a "better camera" to take the picture. The new camera was much heavier than the first one but was to be operated in the same way and at a relatively close distance to the suspected thief.

Following the instructions from her new found friend and employer and working, she thought, in a new and exciting job, Pearl followed Olga on the subway and after both women departed near Times Square, Pearl pulled the wire to expose the camera whereupon a loud explosion occurred and Olga screamed. A subway employee rushed up and asked what happened and Pearl, splattered with blood but thoroughly confused stated, "I just took that woman's picture and somebody shot her".

It turns out, of course, that it was all a complicated ruse concocted by "Allen La Rue", the so-called "detective". Filled with hatred and jealousy of Olga, the wife he was separated from, "La Rue", whose real name was Alphonse Rocco, had made up the whole story about Olga. Though she lost her leg, Olga Rocco survived the attack. Alphonse Rocco was found several days later and was killed in a shoot-out with the police.

It sounds like the stuff of fiction but the story is, sadly, quite true. Olga and Pearl became friends after the incident. A lawsuit brought by Olga against the city of New York for failing to protect her from a man whom had threatened her repeatedly and whom she had repeatedly provided information on to the police went nowhere.

This is a story of deception and fraud. Unfortunately this type of story is all too common in the world. In my teenage years, not fully understanding the unfortunate ways of many occupants of the world, I didn't understand the caution my parents initially showed when I began to mention the subject of cryonics to them. Fortunately for me, a brief discussion with our family doctor helped to smooth the way as he honestly replied to their queries something along the lines of "Who knows. It might work".

The reality is that cryonics isn't a scam at all. I had the privilege of knowing the man who can be said to be primarily responsible for both the development of the idea and for its dissemination among his fellow humans. He was one of the most intelligent and one of the most decent persons I've ever met. No remote smidgen of an Alphonse Rocco existed within him and the idea he developed has exceeded over a half century since its first public promulgation. Cryonics is still here and still getting gradually stronger with each passing year. It is a real and viable concept to which more and more people are gradually joining up with. Take advantage of that real and viable idea and join with us today!!

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