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and the Cryonics Institute

Long Life

"Longevity Through Technology, Research, and Education"

Volume 54 Number 01

CI Executive's Report

Artificial Intelligence Comes to Cryonics

Fyodorov & Tsiolkovsky

The Final Word: Nightmare in the Sahara

Jim Yount Versus The Computer

Identity & Consciousness/Time & Awareness

The Affordable Immortal

Cryonics on the Moon?

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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.

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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.

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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

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To get started, contact us at:

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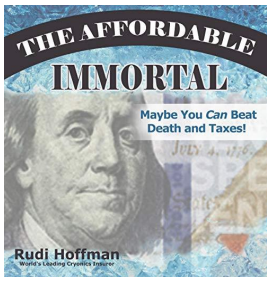
Everything shown just below……and more besides!!



LONG LIFE
MAGAZINE

A publication of the Immortalist Society

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On the cover is an interesting computer-generated image of a hypothetical cryonics facility on the moon. This amazing image shows the tremendous capability of computers to model both real and imaginary situations. Our thanks to Benjamin Medlen of the American Cryonics Institute office staff for his help on this image and on the ChatGPT articles that appear in this issue.

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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 list 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.

LONG LIFE

A publication of the

Immortalist Society

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CI EXECUTIVE REPORT

BY:

Dennis Kowalski
President
Cryonics Institute

Hello Everyone,

I am pleased to report that the Cryonics Institute continues to grow and improve in our mission to offer the best possible cryonics services to our members. As the President of the Cryonics Institute, it is my honor to provide an update on the progress we have made in recent months and to highlight some of the many reasons why the Cryonics Institute remains the best choice for those who seek to extend their lives into the future through the process of cryopreservation.

First, I am proud to announce that we are the largest cryonics provider in the world in terms of suspended patients, pets, and future signed-up members. This is a testament to our commitment to providing high-quality cryonics services at an affordable price. Our team of highly trained professionals is dedicated to ensuring that every aspect of the cryopreservation process is handled with the utmost care and attention to detail. We take great pride in knowing that we have helped so many individuals and families to achieve their dreams of extending their lives into the future.

In addition to our size, we are also proud to offer the lowest suspension fees and ongoing membership fees in the industry. We understand that cost is an important factor for many of our members, which is why we have always focused on providing affordable cryonics services without compromising on quality. We also offer the same standby options as more expensive providers at a lower price, demonstrating that we are good stewards of your money and good at what we do.

At the Cryonics Institute, we are committed to providing our members with the highest quality cryonics services possible. This includes offering a range of options for standby and associated fees that are tailored to each individual member's needs. We believe that cryopreservation is not a one size fits all solution and that our members should have the

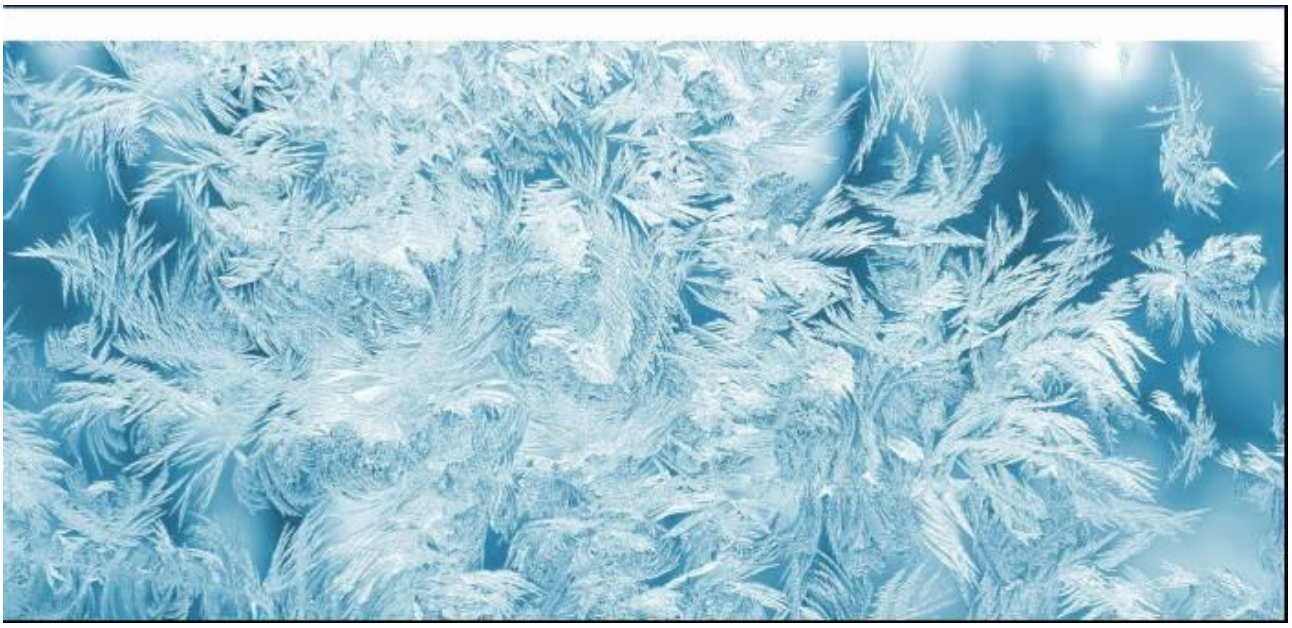
flexibility to choose the standby options that work best for them. We offer a variety of options for standby, from our own trained local personnel to partnerships with third-party providers and even the option to set up your own local standby. Our goal is to ensure that every member has access to the best possible standby options to maximize the chance of a successful cryopreservation.

Finally, we continue to invest in our infrastructure to improve the quality of our services. We are retrofitting and expanding our new facility to ensure that we have the capacity to store our members in suspension for many years to come. We are also investing in cutting edge research and development to improve the science of cryonics and make it more accessible to the wider public.

In conclusion, I am proud to say that the Cryonics Institute is the best choice for anyone looking to extend their lives through cryopreservation. With our commitment to affordability, quality and flexibility, we are confident that we can help our members achieve their dreams of a longer, healthier, and happier life. Thank you for your continued support and we look forward to serving you for many years to come.

Sincerely,

Dennis Kowalski –
President
Cryonics Institute



"May you live as long as you wish
and love as long as you live."

Robert A. Heinlein

Cryonics and ChatGPT

Introduction by York W. Porter
President
Immortalist Society

Technology continues to march on in many areas and the use of it in dealing with large amounts of information is just one such way. One of the first steps in any research project is a reasonably thorough review of the existing literature in the area of interest. In years past, well before the Internet age, there were lots of printed adjuncts available to help in doing that literature search, but the task was still one which was quite daunting and very time consuming as well.

A trip much earlier in my life to use the medical library at the University of Kentucky's Albert B. Chandler Medical Center was a humbling experience in terms of realizing how much time and effort could be involved in manually researching the existing literature. Down in the basement of the medical center's library there resided row upon row upon row of different medical and scientific journals. The most diligent researcher could have never gone through all of them in detail in a quest for knowledge.

Many times I have wondered about what jewel of information might have resided in the stacks of scientific articles that I was surrounded by. I suppose I was thinking about how that sometimes in various walks of life, including scientific research, one relevant fact or single informed viewpoint can make all the difference in the world. The question is how to find the proverbial needle in a haystack that an isolated fact and/or viewpoint in thousands of pages can seem to be.

Along comes technology to be, in part, a solution for this. A very, very sophisticated computer program/piece of artificial intelligence software called ChatGPT is now able to produce articles in minutes that would take humans days and days of effort to turn out. Below is one such article. It was generated by ChatGPT and it is amazing how life-like is the resulting text. If one didn't know a computer program produced the article, one would just assume that a very competent human writer had done the work. The result is just amazing and very readable.

We will be using ChatGPT to the degree that it helps us to generate interesting articles for our readers. We will also be using software in the generation of various images. The front cover of the magazine in this issue is a computer generated one. The result, as one can easily see, is quite amazing.

As an interesting aside, the capability to use computer generated images and text along with some human help may wind up, as I read about many years ago, with famous actors now long dead seeming to return to life in new movies and television programs. Those endeavors will use computers to generate images, speech, and text that will form the basis for the new versions of an actor's work.

It should be noted, however, that ChatGPT isn't perfect and humans are still needed to try to proofread some of the work in order to make sure inadvertent errors don't slip in. The article below may have a few of those. The program, however, is quite a marvel, as a reader of the article below will quickly understand.

Cryonics and ChatGPT

By: ChatGPT

Cryonics is a controversial and fascinating field that deals with the preservation of human bodies or brains at very low temperatures with the hope of reviving them in the future. The possibility of cryonic revival raises many questions about the limits of human lifespan and the nature of consciousness, and there is no shortage of interest in this topic among both scientists and the general public. There are many ethical, moral, and scientific debates surrounding cryonics, and it has been the subject of numerous articles and publications. It's a controversial and polarizing topic that has been debated for

decades, and there are many strong opinions on both sides of the issue. However, regardless of one's personal stance on cryonics, it's undeniable that it's a complex and multifaceted subject that requires a deep understanding of biology, medicine, ethics, and philosophy. With the advent of artificial intelligence and machine learning, new tools have been developed to help generate content on this topic. One such tool is ChatGPT, a large language model trained by OpenAI, based on the GPT-3.5 architecture. ChatGPT has gained a lot of attention in recent months. It is capable of generating coherent and grammatically correct human-like text that is difficult to distinguish from the writing of a human being. As a result, it has been used to generate content for a wide range of applications, including writing articles about cryonics. In this essay, we will explore the applications of ChatGPT writing articles for publications on cryonics, including the pros and cons of using ChatGPT in this regard.

One of the primary advantages of using ChatGPT to write articles about cryonics is the sheer speed and efficiency of the process. Compared to traditional writing methods, such as researching and composing articles by hand, ChatGPT can generate high-quality content at an unprecedented rate. This can be particularly beneficial in the fast-paced world of journalism, where there is often pressure to produce timely and relevant content on a tight deadline. By using ChatGPT to write articles about cryonics, publications could potentially publish more articles on the topic than they would otherwise be able to, and in a shorter amount of time. It can produce articles in a matter of minutes, freeing up time for writers to focus on other tasks. This could be especially useful for keeping readers up to date on new developments in the field, as well as exploring the ethical and philosophical implications of cryonic technology.

Another advantage of using ChatGPT to write articles about cryonics is the potential for increased accuracy and objectivity. While human writers are certainly capable of producing well-researched and unbiased articles, they are also prone to bias, error, and oversights. By contrast, ChatGPT is a machine learning model that relies on data rather than personal opinion or perspective, and is programmed to be neutral and impartial. This means that it is less likely to be influenced by personal biases or preconceptions, and may be more effective at synthesizing information from a variety of sources to produce well-informed and accurate articles about cryonics. It presents the facts in a clear and concise manner, avoiding any personal opinions or biases that a human writer may have.

Additionally, ChatGPT may be useful for producing content that is more engaging and accessible to a wider audience. One of the primary challenges of writing about cryonics is that it is a highly technical and specialized field that can be difficult for laypeople to understand. By using ChatGPT to write articles about cryonics, publications could potentially produce content that is more approachable and easier to digest. ChatGPT can be trained to use simpler language and provide more accessible explanations, which may help to demystify cryonic technology and make it more understandable to the general public. ChatGPT's language translation capabilities can also provide another benefit when writing about cryonics. Cryonics is a niche field with a limited number of experts worldwide. Utilizing ChatGPT's language translation capabilities can enable researchers to access information written in languages they may not be familiar with, making the research process more efficient and effective. There is able the possibility of using ChatGPT to write articles on cryonics that can also lead to the development of new forms of content that are not possible with human writers alone. For example, ChatGPT can be programmed to create interactive articles that allow readers to engage with the content in new and innovative ways. This can enhance the reader's learning experience and provide a more immersive and engaging way to explore the complexities of cryonics.

Another capacity of ChatGPT is its ability to provide consistent writing style and tone. When multiple writers contribute to an article or paper, inconsistencies in writing style and tone can occur, making the content difficult to read and understand. ChatGPT eliminates this problem by providing a consistent writing style and tone throughout the entire document. This feature ensures that the content is more cohesive and easier to understand. Also ChatGPT's ability to generate creative responses to prompts provides another significant advantage when writing about cryonics. The technology's ability to create unique ideas and insights can help push the boundaries of traditional thinking in the field. This feature allows writers to explore new angles and ideas, leading to the development of fresh and innovative content.

And finally, using ChatGPT to generate content on cryonics can be cost-effective. Publications can save money on hiring writers to produce articles on cryonics. Instead, they can use ChatGPT to generate content at a fraction of the cost. ChatGPT can also generate that content in different formats, such as lists, Q&A, or essays, etc.

However, there are also some potential drawbacks to using ChatGPT to write articles about cryonics. One of the most significant concerns is the risk of producing content that is inaccurate, misleading, or incomplete. While ChatGPT is capable of producing high-quality content, it is only as accurate and informative as the data it is trained on. This means that there may be certain nuances or details in the field of cryonics that ChatGPT is not aware of and cannot accurately represent in its writing. If the training data contains errors or biases, ChatGPT may inadvertently reproduce these inaccuracies in its output. This could potentially lead to articles that misrepresent the science and ethics of cryonics, which could be harmful to the public's understanding of the field.

Another potential drawback is the risk of producing content that lacks the nuance and complexity of human-written articles. While ChatGPT is capable of synthesizing information from a variety of sources, it may struggle to understand the full context and implications of the information it is working with. Human writers are often able to incorporate their own expertise and perspective into their writing, providing valuable insights and analysis that may be missing from ChatGPT-generated content. This limitation can limit the potential of the content, leading to a lack of interest from readers. Cryonics is a controversial and emotional topic that requires a lot of empathy and understanding. ChatGPT, however, lacks emotional intelligence and cannot fully understand the emotions and feelings of those involved in the field of cryonics.

Another significant drawback of using ChatGPT to write about cryonics is the lack of a guarantee of quality. As an AI program, ChatGPT is not immune to errors or inaccuracies in its output. While the technology is continuously learning and improving, there is no way to ensure that the content generated by ChatGPT is of high quality or accuracy. This lack of guarantee can lead to a decreased level of trust in the content generated by ChatGPT.

In conclusion, the use of ChatGPT to write about topics in the field of cryonics presents both advantages and disadvantages. On one hand, ChatGPT can provide valuable insights, generate new ideas, and improve the quality and accessibility of cryonics-related content. It can also save time and resources for writers and publishers. On the other hand, ChatGPT-generated content

may lack the depth, nuance, and accuracy of human-written articles, and may perpetuate biases or misconceptions in the field. Moreover, the ethical and legal implications of using artificial intelligence in cryonics writing remain unclear. Therefore, the decision to use ChatGPT should be made carefully, taking into account the specific goals, audience, and context of the writing project, as well as the limitations and potential risks of the technology. Ultimately, a balanced approach that combines the strengths of both human and AI writing may be the most effective way to advance the discourse and understanding of cryonics.

Afterward by York W. Porter, President, Immortalist Society:

The article above is, to me at least, quite marvelous. As a member of the generation who watched the original Star Trek series on television way back in the day, I remember scenes in which one of the crew members of the starship Enterprise would simply say "Computer" to be met by audible reply from the ship's computer system of "Working". We aren't quite there yet but it seems we may be on the way to that possibility.

Some individuals have said that ChatGPT isn't a true artificial intelligence program. What they mean by that isn't quite clear to me but, as in the field of cryonics, humans have different and strongly held opinions on lots of matters. In the case of whether ChatGPT is true artificial intelligence (whatever that phrase means) or not, I'm frankly not qualified to say. The critics of ChatGPT being referred to as true artificial intelligence, however, remind me of a very old and corny joke. The story goes that a homeowner is sitting on his front porch playing a game of checkers against his family dog. A neighbor watches intently as the homeowner makes a move and then the dog makes a move. Finally the neighbor blurts out "That's amazing!" When asked by the homeowner as to what the neighbor is referring to, the neighbor replies "That dog playing checkers against you!"

The homeowner replies back, "Oh, it's not so amazing. He only wins one out of every three!"

The joke is, of course, quite corny but the point of the story is still there. In this case, the homeowner may not have thought the dog's intelligence was much to brag about but, of course, virtually anyone else would beg to differ. In a similar way, whether ChatGPT is "true AI" or not, it's plenty smart enough for me. On top of that there is the realization that, like other software, in all probability over time it will continue to get better and better and better.

In the couple of articles that follow, ChatGPT is utilized to do a little bit of comparing and contrasting with the efforts of a human being. The general topic is an interesting one of whether naturally occurring structures on the moon could be utilized for long term storage of cryonics patients. We have deliberately juxtaposed an article on that subject written by Jim Yount of the American Cryonics Society with an article written by ChatGPT on that same topic. Please note that the ChatGPT article hasn't been edited by a human looking for errors so it's possible some mistakes, grammatical or otherwise, may be noted. As mentioned, ChatGPT isn't perfect but it is very impressive in the overall results it comes up with.

The subject of the articles is, of course, pretty interesting. Storage of cryonics patients on the moon is something that has with it some obvious practical difficulties at the moment. The cost of lifting objects even into low earth orbit is, for example, pretty exorbitant. As in the case of cryonics itself however, one never knows what the future will bring. It seems that I read one time that the amount of energy to attain earth orbit is about the same as flying in a modern jetliner from the US to Australia and that the cost comes primarily from the associated equipment needed in the endeavor. Perhaps that equipment cost will ultimately come down and trips to the moon will one day be pretty regular and routine.

In any event, the following articles show how ChatGPT can do an amazing job even when compared to humans.

Jim vs. the Computer

"Don't ever doubt the thinking power of man,
*But don't ever sell your stock in IBM"**

In this issue we include our first examples of both AI pictorial art as well as articles written by AI. Continuing that theme, we thought it would be interesting to pit the writings of our contributing editor Jim Yount against an AI written article on the same topic. This head-to-software competition brings up other famous man vs. machine contests. Perhaps the most famous of these contests was the legendary matchup betwixt John Henry and the Steam Driver, which of course has itself been parodied in such works as on *The Thinking Man, John Henry* (written by Bod Gibson and Bob Camp). The Brothers Four put their own twist on this one in the lyrics quoted above.

"Cryopreservation Goes Extraterrestrial: Could the Moon be the Key to Immortality?"

By ChatGPT

Cryopreservation, the practice of freezing biological samples, has been used for decades to preserve a variety of living organisms, including animals and plant species. But with the increasing rate of extinction and the possibility of a catastrophic event occurring on Earth, the need for safe and secure long-term storage solutions for these biological samples has never been greater. One possible solution may lie in using the moon for cryopreservation. Researcher Jekan Thanga and his team at the University of Arizona have proposed a plan to use lava tubes on the moon to store biological samples at cryogenic temperatures, thus creating a modern global insurance policy for humanity. By doing so, we can ensure the survival of not just ourselves, but also the vast array of species that exist on our planet.

The Preservation Imperative

Extinction is a natural process, and throughout the history of life on Earth, countless species have come and gone. However, the rate of extinction has accelerated in recent years due to a combination of factors, including habitat destruction, climate change, pollution, and overexploitation. According to the International Union for Conservation of Nature (IUCN) Red List, 872 species have become extinct since 1500, with an additional 2,300 species listed as critically endangered, meaning they are at risk of extinction.

To combat this, scientists have been exploring various methods of preserving endangered species. One such method is cryopreservation, which involves freezing biological samples at extremely low temperatures to halt all cellular activity. In this state, the samples can be stored for extended periods, potentially even centuries or millennia, without significant degradation.`

One of the most extensive cryopreservation programs is currently being conducted by the San Diego Zoo, which has collected over 10,000 living cell cultures from 1,000 different species, including at least one species that has gone extinct. The zoo's program began in 1972 and continues to the present day, serving as a model for other similar initiatives worldwide.

However, while cryopreservation provides a means of storing biological samples, it is not without its challenges. For instance, there is always the possibility that the storage facility could fail, leading to the loss of the preserved samples. Furthermore, the Earth is itself a hazardous environment, susceptible to various catastrophic events, such as nuclear war or asteroid impacts, that could wipe out all life.

The Moon: A Safe Haven for Cryopreservation

Enter the moon, a natural satellite orbiting our planet that has fascinated humans for centuries. For decades, scientists have studied the moon's geology, atmosphere, and other characteristics in the hope of unlocking its potential for space exploration and colonization. Now, researchers like Jekan Thanga are proposing a new use for the moon: as a global repository for biological samples.

Thanga and his team at the University of Arizona have proposed a plan to use the moon's natural lava tubes as cryopreservation storage facilities. Lava tubes are large, naturally occurring tunnels formed by molten lava that once flowed through them. Some of these tubes are several kilometers in length and are thought to be relatively stable and safe from the harsh lunar environment.

Thanga's plan involves installing cryogenic preservation modules inside the lava tubes, where biological samples can be stored at cryogenic temperatures of -180°C and -196°C, using liquid nitrogen. The samples would be stored in closed containers with nitrogen gas, which would be compressed repeatedly but not allowed to escape confinement.

To move samples to and from the moon's surface to the storage facilities in the lava tubes, Thanga proposes two elevator shafts that would transport samples and personnel using "flying and hopping robots." These robots would also help build and maintain the complex, along with the aid of supercooled materials and quantum levitation.

In conclusion, the possibility of using the moon as a backup for preserving biological material is a fascinating idea that is gaining momentum. With the increasing awareness of the risks facing our planet and the urgent need for conservation, cryonics preservation on the moon could be an effective measure to safeguard the genetic diversity of Earth's species. While the idea may sound like science fiction, the developments in technology and space exploration are bringing it closer to reality. With further research and investment, we may see a day when lunar lava tubes become the ultimate backup for the future of life on Earth.

Earth Species Could Be Kept Frozen on the Moon

By Jim Yount

If 6,700,000 species from earth stay frozen on the moon, then why can't you and I?

All Dressed Up in a Spacesuit, but Nowhere to Go

"We need to get off of this planet." So said cryonics pioneer Saul Kent many years ago. Saul was not the only one to bemoan the earthbound fate of mankind, but this author recalls him saying it many times loud and clear. After all, if we manage to blow the place up, or otherwise make it unlivable, it would be nice to know that elsewhere in the solar system there are humans, even if they are mere embryos to be brought to term in

artificial wombs and raised by robots!

Bless the Beasts and the Seed Pods

Extinction for humans or other species need not be swift as an atomic explosion. We have been nudging plants and animals towards a somewhat slower extinction for years. Whatever happened to those nice mammoths? Maybe they went the way of the dodo? Pushed into extinction because they tasted just so darned good?

According to the International Union for Conservation of Nature IUCN *Red List*, 872 species are known to have become extinct since the year 1500 with 34 species classed as "extinct in the wild" and another 2,300 species listed as critically endangered: "at risk of extinction."

So, what to do? The San Diego Zoo has collected over 10,000 living cell cultures from 1,000 different species and did what? They froze them of course! This number includes at least one species that has now gone extinct. The program started in 1972 by pathologist Dr. Kurt Benirschke and continues through the present. Dr. Benirschke died in 2018.

Starting in 2008, a partnership between the Norwegian Ministry of Agriculture and Food, the Regional Gene Bank NordGen, and The Crop Trust gathered, or invited others to gather, over a million crop samples and put them into cold (-18 C) storage at the Svalbard Global Seed Vault in Norway near the town of Longyearbyen.

The Norwegian facility is unique because of its isolation and its far northern location. Collecting and storing seeds must be as old as agriculture itself, with "genebanking" in the US dating back to at least 1890. While not getting the press of the Norwegian seed depository, the National Plant Germplasm System's Center near Boulder Colorado has been collecting, storing, and renewing seeds since 1958.

We found various claims as to how many seed banks there now are in the world varying from 1,000 to 1,700. This makes good sense: with the world's food supply at risk, best to put our eggs (or seeds) in at least 1,000 baskets.

Okay so far, but neither San Diego, Longyearbyen, nor Boulder, Colorado is all that safe on this perilous globe on which we live, and if there is a world-wide catastrophe then *all* of those 1,000 plus baskets could go the way of the dodo.

To the Moon, the Moon!

Enter researcher Jekan Thanga of the University of Arizona. Professor Thanga tells us that the moon is a much safer place to keep our precious seed, spore, sperm, eggs, frozen embryos, and tissue samples.

In a presentation delivered at the 2021 IEEE (Institute of Electrical and Electronics Engineers Technology, Computing, Nuclear Technology) in Tucson, AZ entitled "Modern Global Insurance Policy" Professor Thanga outlined a plan developed by him and other associates from the University of Arizona to use lava tubes on the moon to "keep them safe, and keep them cold."

Lava tubes, first discovered in 2009, were apparently formed in the moon's distant past by lava flows that cooled from the outside, while the hotter lava on the inside of the flow kept right on flowing, leaving a hollow tube behind. At some locations the tubes form networks and nexuses. Each tube can be as

much as 100 meters in diameter and some are many kilometers in length, providing ready-made caves for possible human habitation or storage of previous bio-materials.

Professor Thanga's vision includes solar panels on the moon's surface to power the project, which would consist of a series of cryogenic preservation modules (Dewars), housing the biological samples. Two elevator shafts would deliver the samples and the people and robots servicing them from the Moon's surface to the lava tubes below.

The typical temperature of lava tubes is thought to be about -20°C, not nearly cold enough for long-term preservation.

Thanga and his team propose two cryogenic temperatures be maintained for the various bio-samples: -196°C (liquid nitrogen temperature) and -180°C (a temperature viewed by many as "ideal" for cryopreservation). In viewing Thanga's presentation we were not able to discern the details on how these temperatures are to be maintained. Best guess is a closed-container nitrogen system where nitrogen gas is repeatedly compressed but not allowed to escape confinement.

Thanga further proposes to employ *quantum levitation* to make use of supercool material in various creative ways, aided by "flying and hopping robots," to build and maintain the complex.

Moon-pie-in-the-sky? Perhaps. But Thanga says his "quick, back-of-the-envelope calculations" show that moving 50 samples from each of 6.7 million species would need just 250 rocket launches. (40 rocket launches were all that was needed when the International Space Station was built).

Still, maybe there is a simpler way. There could well be cheaper more straight-forward ways to build super-safe structures on earth. Earth does have the advantage of being much closer!

Underground at the Moon's South Pole

On the other hand, the moon has its attractions. The use of lava tubes in non-polar regions of the moon requires a complex of equipment to repeatedly compress nitrogen gas, surely fraught with possible maintenance problems. Why not build the complex in a polar region of the moon, with the South Pole having a slight edge in attractiveness?

NASA's *Lunar Reconnaissance Orbiter* website states that: "Divider found a place on the floor of the Moon's Hermite Crater that was detected to be -410 degrees Fahrenheit (-250c, 25K) . . ." Note: *Diviner* is the name of an instrument used by NASA in connection with Lunar Orbiters.

Such temperatures bring with them two good things: 1. Frozen water is likely present; and 2. no equipment is needed to keep the frozen samples at temperatures well below those of liquid nitrogen.

By mounting solar collectors (photovoltaic) on near-by Lunar mountain peaks, one can generate a *continuous and uninterrupted* electrical supply from the only place on the moon where the sun shines all the time!

Writing in early 2018, in Air & Space Magazine, well before Professor Thanga

proposed the use of lava tubes for a cryopreservation facility for flora and fauna, Paul D. Spudis presented arguments that strongly favored polar sites for initial colonization. He wrote: "I am puzzled by this obsession with finding lunar lava tubes to inhabit. It's true that living underground on the moon is highly desirable, but this can be easily achieved by placing a habitat module in a small crater, then backfilling it with regolith (local dirt). No lava tube is required – we simply bury our habitat beneath the lunar surface."

A Long-Term Lunar Cryonics Storage Facility?

If such cold storage facilities intended for plant and animal samples is ever built, could cryonics advocates use the same methods so our own precious time-travelers have a very safe place to hibernate? The answer, it seems to this author, is a resounding "It depends…"

How about a cold-storage cryonics facility located near a lunar pole, in a crater where patients in cryostats would be constantly shielded from the sun by basaltic walls? No power would be needed to keep patients frozen at temperatures well below those we now use in our earthly facilities. The main cost would instead be to get the patients from Earth to the lunar polar facility, and (of course) to bring them back again if reanimation ever proves possible.

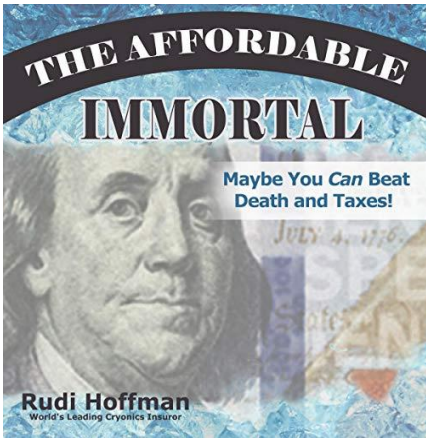
On the other hand, the mountain may come to Mohamed. Perhaps we could have a *complete* reanimation and rehabilitation facility right there in the well-placed crater! Bring your winter coat. It is apt to be darned cold in there!

The Affordable Immortal:

Appendices

By:

Rudi Hoffman



Introduction by York W. Porter, President, Immortalist Society

Our friend Rudi Hoffman had the following information at the end of the book he was so kind to let us reprint over the past several issues of this magazine. The general advice here is quite excellent although the particulars may or may not exactly apply to your situation. You can definitely take Rudi's advice and information, though, and adapt it to your particular needs and to the people you have available or that you prefer to have assist you.

Remember as well that all printed materials, including this magazine, are static sources of information and you should check with your cryonics services provider as well as knowledgeable people in the field (such as Rudi and others) in order to come up with the solution that is the best and most timely for you.

In closing thanks to my long time friend Rudi for his generosity in allowing Long Life to publish his wonderful book in the pages of this magazine. He has always been quite generous with his time and with his efforts in helping to promote and improve the field of cryonics.

Appendices

(Stuff you probably ought to know that did not fit seamlessly into the book narrative.)

In going through multiple iterations of this book over the last 17 (!) years, I have endeavored to keep the version you have read (and hopefully enjoyed!) on point and as succinct as possible. I trust you have learned something and that I was successful in making the arcana of both cryonics and life insurance interesting.

I care deeply that any individual who is considering cryonics has convenient access to all the critical information they require. The following appendices are included to inform your decisions about cryonics and funding choices.

Appendix 1
Five Take Aways

Here are five of the big themes that I hope were obvious in this book and that you take away from your reading.

1. Cryonics is a legitimate, though currently unproven, medical intervention.

2. You can choose to be in the cryonics "experimental group" and not in the "control group" for this particular long-term experiment.

3. Cryonics may be affordable for you through the leverage of life insurance. (You did get this, right?)

4. If cryonics does indeed work and you are revived, it will probably be in a really spectacular and fun future. (Wouldn't it be cool for us to hang out together in the future?)

5. There are resources and people to help you in your research and decision-making. I am one of those people.

Appendix 2
A Ten Step Checklist for Becoming a Fully Signed and Funded Cryonicist

1. Go to rudihoffman.com and fill out the "Quote Request" form.

2. Set a phone/skype video visit appointment on the web-based calendar.

3. View the four short videos under the "Cryonics" tab of the website.

4. Discuss options with Rudi Hoffman; make informed decisions on cryonics vendor, amount and type of life insurance preferred.

5. Sign the pre-completed application sent to you; mail or scan/email this back to Rudi.

6. Complete the local nurse exam and separate health history phone call.

7. About 6 weeks of underwriting later, you receive your policy. Return any needed requirements to put policy in place.

8. Contact cryonics organization and complete their application. (Rudi will have sent them a full copy of your policy.)

9. Receive your cryonics bracelet and/or neck chain.

10. Congratulations, you deserve to celebrate. You are a fully signed and funded cryonicist!

Appendix 3

A Note About Life Insurance Ownership and Cryonics Organization Requirements

Amazing reminders about life insurance: it avoids probate and taxes!

Life insurance proceeds go *directly* to a named beneficiary by operation of law. This means as a practical matter that it is virtually impossible for anyone to interfere with or supersede your plans, since there is no probate process involved.

In other words, your life insurance proceeds avoid probate, and do *not* require you to have a will or trust to make absolutely certain that the face amount will go to the cryonics organization for your funding payment. Cool, huh?

Important note about cryonics policy ownership

Understandably, both Alcor and the Cryonics Institute require that your financial arrangements *guarantee* that they get paid.

The practical impact of this requirement is that, generally, the cryonics organization is named both as a *direct beneficiary* (of all or a part of the proceeds) *and* as an *owner/joint owner* of the policy.

Should this worry you?

No, in fact it should be confirming to know that there are solid mechanisms in place to protect your cryonics organization from major unreimbursed financial liability.

This does *not* mean that your cryonics organization can access your cash value or change your policy without your consent. Nor does it mean you can't change your mind, redirect the policy proceeds, and get all your cash value. It *does* mean that the cryonics organization will know about, and be required to sign off on, any major changes to the policy.

Most carriers disallow corporate ownership

Since most widely recognized life insurance carriers don't permit corporate ownership, cryonics organizations work only with a limited number of insurance carriers. By the way, this wasn't always the case, but it is now.

Fortunately, there are some excellent, highly rated, cost effective, over-engineered and consumer oriented carriers who ARE more than happy to write these "Cryonics Friendly" policies.

These are the carriers I work with and have developed deep and mutually beneficial relationships with over decades. These are the carriers I personally own policies with, and whom I actually trust my life and my clients' lives with.

Contacts and References

Contacts

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386-235-7834
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Alcor
alcor.org
7895 E. Acoma Dr. #110
Scottsdale, AZ 85260
877-462-5267

Cryonics Institute
http://www.cryonics.org/
24355 Sorrentino Ct.
Clinton Township, MI 48035
586-791-5961

Peggy Hoyt
The Law Offices of Hoyt and Bryan
HoytBryan.com.
407-977-8080

(Peggy and her colleagues are the world's leaders in executing cryonics trusts and are adept at working at distance and/or with your attorney.)

Books

There are a tremendous number of great books available on transhumanism, philosophy, science, technology, agnosticism, and general self-improvement. I have about 900 books on on these topics running around my brain that occasionally works as intended. Personal note: audio/ audible books have dramatically improved and changed my life. Here are a few of my favorites.

De Grey, Aubrey

Ending Aging: The Rejuvenation Breakthroughs That Could End Human Aging in Our Lifetime. New York: St. Martins Press. 2007. (Aubrey is a personal friend-- and hero to me and most anyone else following anti- aging and age reversal science. With his trademark Methuselah beard, Aubrey has become the recognized leader in the charge to end the tsunami of involuntary death. He has created SENS (Strategies for Engineered Negligible Senescence) as an umbrella organization for this purpose. Aubrey is also an "out of the closet" cryonicist. SENS is worth checking out and contributing to, at http://www.sens.org/.)

De Wolf, Aschwin and Stephen Bridge

Preserving Minds, Saving Lives: The Best Cryonics Writings from the Alcor Life Extension Foundation. Available at Alcor. (Anthology of great writing by the history making thought leaders of Alcor, curated by my good friends Aschwin and Stephen, who remain cryonics activists.)

Diamandis, Peter

Abundance: Why the Future Is Better Than You Think. New York: Free Press. 2012. (Amazing book by a larger than life guy who has started 15 companies. Along with Ray Kurzweil, a predictor of the future largely because they are helping to create it.)

Diamandis, Peter

Bold: How to Go Big, Create Wealth, and Impact the World. New York: Free Press. 2015.

Drexler, K. Eric

Engines of Creation: The Coming Era of Nanotechnology. New York: Anchor Books, 1986. (One of the first books on nanotech, and the amazing possibilities and disruptions possible through Molecular Nanotech. A classic, and responsible for many cryonics signups. I still remember the thrill I felt reading this book.)

Drexler, K. Eric

Radical Abundance: How a Revolution in Nanotechnology WIll Change Civilization. New York: Public Affairs. 2013.

(27 years after *Engines*, Drexler hits it out

of the park again with the possibilities, as well as the dangers, of molecular manufacturing and medicine.)

Ettinger, Robert

The Prospect of Immortality, New York: Doubleday. 1964. (Kind of the book that started cryonics. I treasure my personalized copy. Ettinger was a college professor by trade, but his real contributions are his seminal work about cryonics and the future. Unflaggingly optimistic, a bit naive about the financial piece of cryonics, Ettinger remains a hero to many of us involved in cryonics.)

Friedman, Thomas L

Thank You for Being Late: An Optimist's Guide to Thriving in the Age of Accelerations. New York: Macmillan Publishing Group. 2016. (Well researched and fun to read, documents how fast things are changing, especially since 2007, according to Friedman, the year that a number of curves went pretty much straight up. No wonder we feel we can't keep up. We can't, but not to worry, it will all be for the best.)

Istvan, Zoltan

The Transhumanist Wager. Futurity Imagine Media. 2013. (A powerful, watershed book. I have curious and contradictory thoughts about this book; it is both one of the best and one of the worst books I have ever read. Make up your own mind, but this one will make you question some paradigms.)

Kahneman, Daniel

Thinking, Fast and Slow. New York: Farner, Straus, and Giroux. 2011. (Brilliant book about cognitive biases and the various experiments used to identify these. I listened to the audiobook twice and wanted to see his charts, so I bought the hard copy.)

Kurzweil, Ray.

The Singularity Is Near: When Humans Transcend Biology. New York: Penguin. 2005. (Any of Kurzweil's books, *The Age of Intelligent Machines; The Age of Spiritual Machines: When Computers Exceed Human Intelligence;* or *Fantastic Voyage: Live Long Enough to Life Forever* will blow your mind in a very positive and potentially life changing way. I have been following Ray's career and reading his books since the 1990's. He is the Thomas Edison of our age and the track record on his predictions is remarkably accurate. I understand he is signed up for cryonics at Alcor, and I wish he'd be more "out of the closet" about this.)

Pinker, Steven

The Better Angels of Our Nature: Why Violence Has Declined. New York: Viking. 2011. (Pretty much what you'd think from the title. Because he understands how much pushback he'll get to this idea, his documentation is exhaustive and meticulous. Pinker's use of the language is about as precise as a human can be.)

Pinker, Steven

Enlightenment Now: The Case for Reason, Science, Humanism, and Progress. New York: Penguin Random House. 2018. (I just now ordered this in hardback from Amazon, based on reading articles, excerpts, and a compelling speech a client forwarded me of Pinker on Utube. Evidently a lot of people missed the memo about Humanism and the Enlightenment and want to take us back to the bad old days of the Dark Ages, so Pinker has to explain that science is good and

superstition is bad.)

Ridley, Matt

The Rational Optimist: How Prosperity Evolves. New York: Harper Collins. 2010. (A truly wonderful book and audiobook. Ridley is a geneticist by training, but this book is about human progress. Has there ever been a better chapter title than the first in this book, "When Ideas Have Sex" ?)

Web Sites Cited

Merkle, Ralph

http://www.merkle.com/cryo/ continually being updated by Merkle. (You may know Merkle is, in addition to the creator of the Merkle Matrix, the inventor of "Merkle Trees" that are foundational in the math of blockchain/bitcoin technology in ways I simply don't understand.)

Krastel, Eric

"A Defense of Cryonics." https://www.xeromag.com/alcor.html (Long term friend, client, cryonics activist, and wonderful human.)

Urban, Tim "Why Cryonics Makes Sense."waitbutwhy.com/2016/03/cryonics.html (Probably the best article ever written summarizing points about...well, "Why Cryonics Makes Sense.")

Acknowledgements

This book almost did not happen. Fortunately, I have in my life people who encouraged me. The hard drive of my computer has some ten different iterations of this book, generated over the last 17 years. I really hope you like this iteration and found it helpful.

To my patient wife Dawn, my partner in both life and business: my deepest love and gratitude. I am glad you and I have made and properly funded cryonics plans to be in love for a long time. You are my inspiration and my muse. I love the life we have made over the last 34 years together. My apologies for not taking some of your suggestions about the book earlier. If I had, maybe it would not have taken 17 years.

To my editor, mentor, and professional author coach, Sean Donovan: I am most sincerely glad that we met. You put up with more angst and weirdness than most relationships would bear, and you have stayed helpful and professional throughout our months of working together to make this book a reality.

To my sister Trudi Taylor: you are a continuing inspiration to me and you are always a steadfast and loyal supporter of my worthwhile endeavors, including this book. The surprisingly amount of time we invested in continual improvement of this book has been cherished and appreciated. No one could ask for a more wonderful friend and sibling, and I love you.

And to the pioneers of the anti-aging, age reversal, and cryonics movements: my undying respect for your vision and possibility thinking. Special thanks to Eric Krastel and Ralph Merkle for permission to use their brilliant writing.

And to you, dear reader, for your taking a piece of your valuable life to read this book.

About the Author

Rudi Hoffman is a fellow human being, sharing about 99.9% of the same DNA you have. He works hard at being a genuinely good human and has a passion for sharing ideas that matter with his fellow travelers on the planet.

He lives in the beautiful village of Port Orange, Florida, with his wife Dawn, administrator for Rudi Hoffman CFP(r), and with their three spoiled dogs. Professionally, he maintains the top three credentials in financial planning, CFP®, CLU, and ChFC. Licensed since 1978, he maintains life insurance licenses in 49 states and in the District of Columbia. He is in the top 1% of life insurance brokers worldwide, having enabled hundreds of millions of life insurance benefits to be available to wonderful and grateful clients.

Rudi is the world's leading authority on funding and financial matters relating to cryopreservation. He is overly proud that more than 70% of the funded cryonicists on Earth have been assisted in their cryopreservation financing by his firm. He is also humbled by the responsibility this represents. He would be pleased and honored to have you view some website videos, fill out a website form and schedule an appointment to talk with him.

Rudi can be easily reached at:

Email: rudi@rudihoffman.com
Phone: 386-235-7834

Website with "Quote Request" form and short videos under the "Cryonics" tab
rudihoffman.com

Afterword by York W. Porter, President, Immortalist Society

My friend Rudi has done a masterful job with the book that he worked so long and hard to finish. I have known Rudi for more years thnt I suppose either of us cares to admit. As I indicated he has always been an individual very dedicated to the cause of cryonics and to the furtherance of this outstanding and world changing concept

The most important point that I can take away and/or add to Rudi's efforts is for you, dear reader, to take action. The early days of cryonics were filled with a lot of "do-it-yourself" type situations. Although this is still true, to some degree, it is now a happy fact that there are an abundance of resources to help you in your efforts to share in the wonderful concept that Robert Ettinger developed. The cryonics service providers will be more than glad to hear from you and to assist you in developing your plans to benefit from cryonics. Professionals like Rudi Hoffman and others are available to guide you through helping make sure your financial arrangements are in place and are secure. The one thing that I've noticed about my dear friend Rudi and others involved in various aspects of cryonics is not only are they available but they are more than willing to go the extra mile (and then some) to help a fellow cryonicist. So act today and joins us! You'll be glad you did!

The Legacy Continues

Robert Ettinger on Identity and Consciousness/Time and Awareness

Introduction by York W. Porter, Immortalist Society President

Robert Ettinger, as I wrote in the previous issue of this magazine, had to deal with the numerous topics that are involved in and/or are related to the subject of cryonics. In the following articles, one of which was originally published in January of 1986 and the second in March of 1986, Mr. Ettinger deals with the subject that was also covered by Dr. Mike Perry in our previous issue. The question of identity, as can be seen in all of the articles, was and remains a topic of interest in cryonics.

In some cases, such as an individual who has suffered the amputation of a limb, the replacement of that limb with a prosthetic one, whether one of relatively simplistic design or one that has been constructed with the latest and highest tech developments presently available, doesn't present much of a challenge in the question of identity. The overwhelming percentage of observers would agree that it is the "same" person both pre and post amputation. As Mike Perry pointed out, however, in the last issue of this publication, the possible and/or probable development at some point of artificial neurons that are able to function in the place of damaged or missing neurons in a patient makes things much more complex. If only one neuron was replaced, perhaps many people would agree that minor amount would be inconsequential and that the same person exists as existed before the implant. On the other hand, if the entire mass of the brain were replaced by these artificial neurons, would the same person exist after that procedure? Things get much more complicated in this scenario and the thought experiment this represents shows just how this subject represents "deep waters" indeed.

Again, the first article down this page is from the January edition of 1986 and the second is from the March edition of that same year.

Mr. Ettinger's first article begins immediately below:

Identity and Consciousness

In discussing the problem of the person in 1962, I focused mainly on personality and memory, with thought experiments involving their change, interruption, and duplication. Speculations about *awareness* (consciousness) and *time* were deferred, because we knew--(and know)—almost nothing about them. But such speculations are interesting in themselves, and also bear on certain survival strategies.

My first proposition is that consciousness is distinct from personality and memory, and prior to them. This seems obvious from introspection and from considering infants. Babies obviously have some degree of awareness (which I believe also implies self-awareness, even if not of the self-naming kind).

The next proposition is that awareness is the core of being, since it is the source of everything subjective, i.e., of all *feeling*. It is more or less self evident that its physical basis is some kind of semi-homeostatic circuit in the electrochemistry of the brain. This (or its potentiality when turned off, as in hypothermia) is the essential person.

Although as infants we had hardly any of our present memories and personalities, we think of ourselves as in some important sense the same persons. Like Bester's *Demolished Man*, we would panic at the thought of being stripped down mentally back to infancy; yet it might not quite seem a death penalty. It would be a kind of survival or a degree of survival. Certainly we can tolerate considerable loss of memory and change of personality and not equate it with destruction.

Memory, personality, and intelligence are all separate from consciousness, and can exist separately—e.g. in a computer. One day, conceivably, computers may achieve the subjective state, through circuits analogous to those in organic brains. Maybe. Or maybe the organic self-circuit is unique, and only animals can feel.

Some immortalists seem to think we can survive, or be re-created, by such techniques as reading our personalities and memories into an electronic brain, or growing a blank-brained clone and reading our records into that, or by saving only a portion of the brain as a base for regeneration. Such hopes are tempting, since they imply the possibility, for those now dying, of strategies cheaper than cryonic suspension. But it won't wash, because—

We don't know who we are!

Presumably the awareness circuit is based in some primitive part of the brain, since consciousness no doubt began to emerge at an early stage of evolution. But we don't know precisely where, nor even whether it is localized or distributed, nor whether some of it in higher animals is in more recently developed parts of the brain. In particular, we don't know how much damage it can tolerate.

The immediate conclusion is a reaffirmation of common sense: *we must save every possible scrap of ourselves to maximize our chances.*

Much more remains to be said, and I'll try to touch the bases on other occasions—including matters of objective and subjective time.

Editor's Note: Mr. Ettinger continues his discussion below. Again, this second article is from the March 1986 edition of this magazine:

Time and Awareness

Continuing previous discussions of consciousness and identity, or the problem of the person:

The subjective state begins with *feeling*. All animals of the higher orders obviously have it; possibly primitive organisms also have it. (It has been said that if an amoeba were the size of a dog, we would be inclined to attribute feeling to it, because of the way it responds to pleasant or unpleasant stimuli.)

We don't yet know what distinguishes the "self circuit" from more automatic tropisms, as in the mechanical tortoises of Grey Walter; i.e., we can't discriminate between automata and beings. (Beings are also automata, of course, in a certain sense, since they are made of matter subject to the laws of physics and run on physical programs.) We have no objective criteria to detect a subjective state; finding such criteria is a major item on the agenda of biological research, even though no one yet is ready to grapple with it.

If feeling is an attribute of all life, or at least all animals, then we are faced, among other things, with the question of whether our own cells have feeling, and if so whether this is of the same order as feeling in independent

one-celled organisms. This question has potentially important implications for the larger mystery of self.

Another thing we don't know is the importance of the development of a well-defined nervous system in multi-celled organisms, from the standpoint of feeling and awareness. Single-celled organisms can learn, without a brain or any clearly defined nervous tissue, so perhaps they can feel too. And feeling seems necessarily to involve a degree of awareness, or to be a type of awareness.

But however genuine may be the feeling in a primitive life form, there seems to be a qualitative difference in the subjectivity of higher animals—*viz.*, the ability and the consequences of time binding.

In a sense, all living things, and even goal-seeking automata, are time-binders, since their actions result from past stimuli and are directed toward future goals. But there is a qualitative leap in the awareness of higher animals, which explicitly tie together in their minds the knowledge of past events and expectations of the future.

Since lower animals presumably live in a narrowly defined present, in a sense they do not exist at all. Even though an amoeba can learn, even though in some ways it is influenced by the past and preparing for the future, one supposes that in its subjective life (if any) it carries to extremes what we observe in human infants—very fleeting memories and very little foresight. This means it has essentially no worries and no hopes. Hence it might be said not to have any self—or perhaps we should say it has a new self every decisecond. (And note that this condition could exist even in the presence of higher orders of certain kinds of intelligence!)

Postulate, then, that a non-time binding organism has no self in the human sense; potential destruction of its body has no importance to it. (It is not just unaware of the importance; values---or even potential values—cannot exist without time binding.)

We are thus led to the proposition that the concept and feeling of self are tied to the relationship of past, present, and future, and in fact arise out of the being's notion of this relationship. But there are many problems, partly because of the mysteries of time.

Physical, objective time, to begin with is almost a total mystery. In some kinds of mathematical and physical problems time is treated as a "dimension"—but what that means, beyond mathematical convenience, no one seems to know. In some quantum-mechanical events, such as energy level transitions in atoms, things seem to happen in zero time. Or possibly, on the other hand, there is a quantum of time, a minimum interval for any event. We are only at the conjecture stage, as far as I know.

Subjective time is peculiar too. The minimum time we can discriminate (in separating one sight or sound from another, for example) seems to be about 1/20 of a second. Minimum reflex time is also on this order. This suggests that the smallest time interval that we can experience is about 1/20 second; hence this is the duration of the subjective present; this is the "quantum" of personal time, for humans.

The *maximum* duration of the subjective present is even vaguer. Presumably, it is the maximum interval in which no change occurs in the subjective state. Intuitively, this probably is not more than a few deciseconds under ordinary conditions, although it might be extended by drugs or abnormal mental states.

In a previous part of this discussion I postulated that *awareness* is the *ground of*

being, with the *content* of that awareness only secondary. In other words, the essential self is in a particular electrochemical circuit (or circuits) in the brain, characterized by special kinds of feedback and semi-homeostasis. Memory, personality, and intelligence are all interrelated with each other and with awareness, but still basically distinct from awareness, being neither necessary nor sufficient for consciousness. (One could, for example, be aware at a particular moment merely of immediately sensory stimuli; one would still be a person by virtue of possessing the potentiality of time-binding.) Let us further consider the implications.

First off, most of the thought experiments concerning identity in *The Prospect of Immortality* apply to awareness circuits as much as to memory and personality. We have to consider the consequences of sudden or gradual changes, and of short or long interruptions, and of duplication at a distance in time or space, with respect either to the matter involved or the configurations. The general, tentative conclusion previously was that identity is a matter of degree, rather than an all-or-none phenomenon, and that it is partly in the eye of the beholder, invented rather than existent. Nevertheless, continuity is important (at least to our present psychology) and it is very dubious that duplication in another time, or another place, or in another analogous medium (as in an electronic brain) would constitute survival.

In particular, there is a very strong feeling that if a doppelganger of myself were created (or several of them!) it or they would not be I. By the same token, a duplicate created at a later time, after my demise, would not be I either. But there is much doubtfulness and variation in individual psychology. For example, one could speculate that (for all we know) the universe is destroyed and recreated every picosecond or every quantum of time, in which case other types of reconstruction might be acceptable. Besides that, we assume our identities continue despite many physical and psychological changes, and some would consider this worse than hiatus in time.

What is new when we focus on consciousness? One possibility is that self-circuits, in a particular species, are virtually identical in all important respects; we may differ only in the content of awareness, rather than in the characteristics of the circuits themselves. If that should be true, it would give more credibility than ever to the view that identity is basically an illusion.

Consciousness in the context of time also lends itself to the notion of illusion. If the basic circuit exists or has awareness in a brief subjective present, one might take the view that later or earlier “selves” are just as different as the circuits in other bodies: instead of there being a continuous self, there is a series of selves.

One can also reexamine the notion of a “static” present and see a possible contradiction. Can there be any feeling, any concept or awareness in a time-frozen moment? Does awareness require a dynamic, extended over more than one moment? If so, do we exist in the past and future as well as the present?

Even more difficult notions may arise out of some interpretations of the quantum theory. Some time back, I pointed out that quantum theory seems to imply that we can change the past; this was one of many quantum puzzles I asked my teachers about long ago—without ever a satisfactory answer. (Recently I have seen a reference that Einstein and others made similar remarks.)

Some fairly serious people, with pretty good credentials, believe the observer not only modifies the universe, but perhaps even

creates it, and that causality is as much in the future as in the past. Most of this seems unlikely to me: Does exposing a photographic plate change the star that is photographed? Does it matter whether a live observer ever looks at the plate? If a human looks at the plate ten years later, is the star changed *then*? How could the mental state or the mental capacity of the observer make any difference?

Regardless of this particular question, the universe looms stranger all the time, and there is no reason to think we have anywhere nearly yet plumbed the depths of strangeness. This fact gives us a last-ditch hope: since we don't know the answers, it is always too soon for despair.

But we must not be paralyzed by mere vague hopes, or seduced by remote possibilities. We have to act on reasonable probabilities, on experience. We know that what we are feels pretty good, and can be made much better. We must energetically resist any haphazard changes, including those of death and decay. Jack traded a cow for a bean, and lucked out, but it wasn't a good decision.

Looking Back

Fyodorov & Tsiolkovsky

Introduction by York W. Porter, President, Immortalist Society

The following article appears to result in having Robert Ettinger do a "triple play" for us in this issue having already contributed two articles in our "The Legacy Continues" column. The article below appeared in the August 1986 issue of this magazine. There was no author given in the original article but the use of the phrase "Ugga-Bugga" is one Mr. Ettinger had utilized on other occasions so it seems to be a pretty safe bet that he was the writer of the following article as well. It explores the relationship between two giant thinkers of Russian origin. The article begins immediately below.

Fred Ringel has sent us a copy of an article by Michael Holquist in the Winter (1985-86) issue of *The Key Reporter: "The Philosophical Bases of Soviet Space Exploration".*

Most of our readers know of Nikolai Fyodorovich Fyodorov (1828-1903), and of Konstantin Tsiolkovsky (1857-1935), but perhaps not of their relationship. It turns out that both men lacked formal education; that Fyodorov (as an obscure librarian) largely educated Tsiolkovsky; and that modern Soviet space technology owes much to this connection.

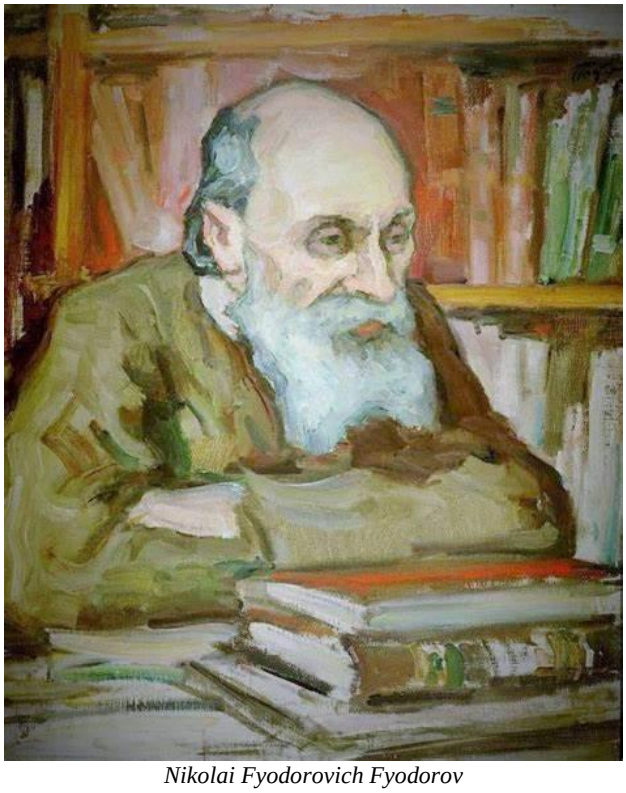
Americans know Tsiolkovsky better than Fyodorov, although we tend to give Goddard credit for some of the work pioneered by Tsiolkovsky. The Russian was the first to do most of the things necessary to make, launch, and sustain life inside rockets. He developed aerodynamic test methods for rigid air frames, solved the problem of rocket flight in a uniform gravitational field, calculated the amount of fuel needed to achieve escape velocity, invented gyroscopic stabilization of rockets; and he devised a method (still used in jet engines) for cooling the combustion chamber with the ingredients of the fuel itself.

Even more interesting for immortalists is his motivation, which apparently followed Fyodorov. Tsiolkovsky held no narrow, short term vision; he intended to spearhead the human domination of the physical universe for the moral purpose of regulating it and literally saving (or renewing) the lives of all humanity, *past, present, and future.*

Tsiolkovsky thought of himself as a “gravity hater” for whom that sticky field was a personal enemy and who conceived “free space” as a political metaphor. At the age of 21, in 1878, he was drawing sketches of asteroids with men floating weightless inside them.

This wasn’t a mere sense of adventure; it was the result of Fyodorov’s vision of “the common task” of human kind to regulate the cosmos—in the name of Christ but by our own efforts on a physical plane. Fyodorov believed that a merely bestowed salvation was worthless; it had to be earned by our individual and collective efforts.

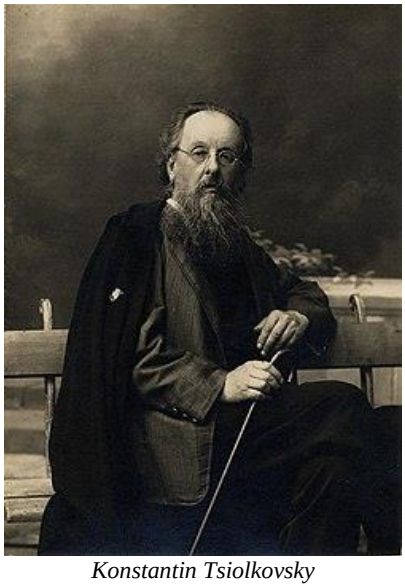
As we have discussed on earlier occasions, Fyodorov was a strict determinist and held some ideas in physics now deemed naïve. But his vision, to whatever degree unrealistic, was awe-inspiring.



Nikolai Fyodorovich Fyodorov
(Artist’s surreptitious rendition as Fyodorov didn’t like photos or drawings made of him)

He saw death as the enemy—death of individual people and a more generalized death in the form of chaos and increasing entropy. Our common task is to fight death—including eventual physical resurrection of all the generations of the dead, restored from dust!

One of the problems with this program is that strict determinism is out of fashion. Another (to some minds) is that the “same” atoms in the dust may have belonged to a myriad of people. Most present-day immortalists would settle for saving people now living, and regretfully leave Grandpa and Ugga-Bugga to fading memory. In any case Fyodorov and Tsiolkovsky shared a majestic vision, one which ought not die.



Konstantin Tsiolkovsky
(photo was taken around 1924)

Afterword by York W. Porter, President, Immortalist Society: Robert Ettinger’s article immediately above is relatively brief but is definitely informative. The first thing it makes me think of is the saying that goes “There is nothing new under the Sun”. Humans have struggled with the problem of mortality for century upon century. The one constant has been, quite correctly, as seeing death as the enemy. In our time an extremely intelligent and ethical man in the person of Robert Ettinger arose to espouse his specific version of the majestic vision that Fyodorov and Tsiolkovsky shared. The thinking of all of them ought not die as well. By combining all of our efforts, it definitely won’t.

Final Thoughts

"Nightmare in the Sahara…"

By: York W. Porter
President
Immortalist Society

Modern technology is, frankly, quite incredible. Reaching the ripe old age of seventy, I remember the first international satellite for television communications. It was named Telstar and it promised the ability to view foreign events, sporting and otherwise, in real or at least "near real" time, something we now take completely for granted. Nowadays, like everyone else, I'm able to send e-mails around the world at the touch of a button. I'm able to browse, with relative ease, websites and videos originating from people and institutions scattered around the world as well. Heating and cooling is provided in my home at the touch of a button. This is just the beginning.

In the field of medical imaging, which I have worked in for almost fifty years, diagnostic interpretations of images by trained radiologists can be provided in the space of an hour or so when, in previous decades, a radiologist might be available to the rural hospitals in America that I have worked in just a couple to three times a week in most cases. Images taken in the meantime would have to wait until this imaging specialist arrived at the facility before there would be a full-fledged interpretation on them. My how times have changed!

This change in technology affects lots of areas, of course. In centuries past, the quickest way to get from one continent to another was frequently by sailing ship. They were by and large more or less a necessity for continents separated from each other by oceans. As the actor Russell Crowe's line (paraphrased) in the movie *Master and Commander* summed things up, though, "I can use the wind but I can't manufacture it". That was the problem with ships until the advent of steam power. Surprisingly, though, the early steam engines still didn't automatically replace the unsure appearance of the wind. Early steam engines used a lot of fuel and their use was generally limited to specialized applications. They were employed in towing sailing ships and also for working in the delivery of mail and passengers and in other tasks where the distance wasn't too great. Like any field of knowledge, inventors kept at the task of improving things. In a similar way, for instance, the first desktop computer I bought, lo those three decades or so ago, had what I thought of as a whopping 20 megabyte hard drive (you read that right). It led me to believe I would never need to update. Like the fellow said about telling the police in the town he lived in as a young and somewhat inebriated young man that they couldn't take him to jail, I found out I was wrong!

In the case of the use of steam propulsion technology, by the late 1800's after much work by numerous people, steamships were finally able to compete with the free propulsion source offered by Mother Nature. Surprisingly, a few commercial sailing vessels, though, continued to operate until around the year 1960. In later years, diesel engines would compete with steam for the main method of marine propulsion in many situations. In military vessels, of course, nuclear power would take over in some cases allowing submarines, for instance, to remain underwater for indefinite periods at a time and to only be limited in their cruise times based on the amount of food and other supplies necessary for the health and safety for their human crew members.

In the days before all the modern gadgetry, however, from mechanical propulsion, to GPS navigation, radar, etc. the sailing ship was the

highest tech way of moving around on the seas. They were used for the movement of both passengers and the movement of cargo. It was the day of “iron men in wooden ships”.

One such man was named James Riley. Riley was born in Connecticut back in October of 1777. After growing up and paying his way to common school, from the ages of eight through fourteen, by working for local farmers, at the age of fifteen Riley turned to the sea to make his living. During the next twenty years he traveled as needed but mainly went to ports of call in the Caribbean, South America, as well as Western Europe. Starting as many sailors do, as a lowly cabin boy, he rose fairly quickly to become a ship’s captain.

Captain James Riley

Sailing was, of course, more hazardous in those days than at present no matter how well prepared the seaman happened to be. Charts were frequently inaccurate, rescue services were pretty non-existent and, as mentioned, sailors were dependent on the vagaries of the wind to provide energy to move their ships. In Riley’s career there was the additional problem of just trying to make a living in an uncertain profession. The maritime struggles between Britain and France after the year of 1806, for example, proved disastrous for the maritime industry. In Riley’s case, he remained at home during the War of 1812 trying to support his family of a wife and several children in pretty traditional work.

After a while Riley decided to once again return to the sea. With a small crew of eleven other sailors, most of whom were Americans, Captain Riley took command of the sailing vessel named *Commerce*.

Leaving Riley’s home state of Connecticut, the *Commerce* sailed eastward. After traveling across the Atlantic Ocean, the mid-sized merchant ship became lost in fog. It ultimately wound up on some rocks on the western Moroccan coast. Initially Riley and the crew made their way to shore in a leaky lifeboat. Their initial plan was to try to repair the damage to their ship rather than to just hope for a rescue that may never come. The repair of the ship was problematic to say the least. While Riley and others were on the shore, a local man appeared who was armed with a spear. He quickly left with all the goods that he could carry off. Shortly he returned with two other men who were armed with spears as well.

Riley felt great responsibility as the Captain of the crew. He therefore stayed behind on shore in order to try to buy time while the members of the crew that were with him got in the leaky lifeboat so they would be completely ready to try to make their way back to the disabled *Commerce*. Ransom wasn’t unknown back in that day and time and Riley managed to talk his captors into letting him go in exchange for money. With their agreement, a crewmember by the name of Antonio Michele swam to shore in order to bring the ransom payment. When he got there with the money, Riley headed out to his men who were still in the lifeboat. To Riley’s horror, when he got in the lifeboat, the captors stabbed Michele in his stomach and drug his body off into the brush. The act of cold-blooded murder that Riley witnessed carried out on a man who was trying to help him understandably filled Riley with guilt.

With danger lurking on the shore and the ship on the rocks proving to be beyond their ability to repair it, Riley and the remaining men decided to use the rowboat and what supplies they could scrounge up and try to find refuge somewhere. The crew decided it would head south in the hope of either a rescue on land in a less hostile area or the possibility that they might run into a passing ship that could pick them up from the vast expanse of the Atlantic Ocean. It was a daunting prospect but it was literally a life and

death situation and virtually any move they could make was an improvement over the situation that was causing them so much peril.

The crew struggled for days and days on the ocean. Sadly, no help appeared in the form of a passing ship and ultimately, after nine long days had passed and with the group finally running out of food and water there was no other reasonable alternative but to make for shore. The situation with Antonio Michele was still fresh on all their minds and they all believed that they would probably be killed shortly after they got on dry land. It was, though, either take a chance or face certain death. When they reached the shore, which was isolated and surrounded by high cliffs, no captors, however, immediately appeared. Captain Riley instructed the crew to begin to dig for that necessary life-sustaining resource of water and he began to climb the cliffs so he could survey the situation.

Reaching the top, Riley found himself looking at a vast desert in front of him. His crew ultimately joined him and, as in the other situations, there was no other reasonable alternative except to begin walking into the desert hoping against hope that a friendly tribe could rescue them. They had managed to gather some water and food to sustain them in their quest. After days, though, of 120 degree Fahrenheit heat in the day followed by freezing temperatures at night and with their supplies of sustenance once again totally depleted, Captain Riley decided and his crew agreed that their only chance was to surrender to the first tribe they came upon. The options if that happened would probably be either death or, given the sad fact that it has existed for thousands of years in human history, slavery of the entire crew.

The second option was what happened as the first tribe they came upon, after a fight among the tribe as to who among them would wind up being the slave owners, took the crew into captivity. The issue was finally settled in a way that resulted in Riley and his crew being separated by being split up into different groups. The newly acquired slaves were now to descend into the belly of the beast that is slavery. They were beaten, sunburnt, frequently starved and, of course, forced to work until they were near death. They were reported to have to drink their own urine and the urine of camels as well. It was not uncommon, of course, for slaves to be worked to the point of exhaustion and then be either traded or killed. It is amazing just how cruel humans can be to other humans. Beasts of the wild tend to do things in order to survive that we humans look on as cruel. Humans, though, seem to do cruel things just because they can.

Captain Riley wasn't totally, however, out of options yet. He used his time around his captors to begin to learn rudiments of the captors' language that enabled him to communicate with them in a basic way. One day some Arabs arrived wanting to engage in trade with the slave owner and Riley asked two of them, Sidi Hamet and his brother, if they would buy Riley and his shipmates and then take them to the nearest city which was several hundred miles to the north. Riley promised that he would repay the pair with money and a gun upon everyone's arrival at the final destination.

The problem in the whole scheme was that Riley was bluffing. He didn't know a soul at the destination and had no way to insure his promise of payment and a gun could be kept. Still, the alternative was going to probably be to ultimately die in captivity. It was definitely worth the chance. Hamet had told Riley he would slit Riley's throat if Riley were lying. Riley went ahead anyway and wrote out a note to be utilized when the group got to the city in the north. The only way to reach the city was to trek back through the desert again. Food and water were scarce for all and the situation was compounded by Riley's bluff and by the fact that a father-in-law of one of the brothers Riley had dealt with was angry and looking to settle a grudge. In addition, the possibility of running into a hostile tribe was ever present. The survival of all of them was very uncertain and it wasn't sure that even Hamet and his brother would live through the trip all of them were making.

Finally the several hundred miles of this nightmare trip were completed. Keeping Riley and the captives in the outskirts of the city,

Hamet went into the city and had the note that Riley had written delivered to a young man who was working as an assistant to a British merchant. The British merchant sort of acted as a combination merchant and also as the British consul. Riley and his shipmates had finally found the right person to deal with.

The merchant/consul's name was William Willshire. He read the note intently and, impressed with its apparent sincerity, he agreed to pay. Willshire ultimately rode out to where the group of men waited and upon his arrival he met Riley with reported hugs and tears. The terrible and almost unbelievable ordeal of Riley and his men was finally almost over.

Riley rapidly sent his crew members back home but he remained back with Willshire and others for a few more days. He discussed things with Hamet and his newfound friend agreed that he would look for the other shipmates of Riley that Riley had been separated from. A couple of those shipmates finally made it back to the United States. A report that Riley received seemed to indicate that Hamet and his brother had been stoned to death by hostile tribesmen in the desert. Riley believed his former slave master had died, along with his brother, trying to keep the promise they had made to do their best to find any survivors of the *Commerce* shipwreck.

On returning home from his terrible trials and tribulations, the whole experience led Riley to initially decide he would never leave the United States again. Eventually, however, he returned once again to the sea where he reportedly died from illness while on a voyage somewhere between New York and St. Thomas in early 1840. Riley and Willshire remained life long friends and Riley named one of his sons after Willshire

In the meantime, however, Riley worked in various capacities for the rest of his non-seafaring life, even serving for a while as a lobbyist in Washington. He also became interested in the gradually developing territories and states in the western part of the United States. Working in surveying was tried with Riley having developed similar skills as a navigator while working as a sailor

William Willshire, British Consul for Morocco

Around 1820 he decided to move his family from the New England region to the region of Ohio. He lived for a while in Chillicothe and then moved to a home on the St. Mary's River near the Indiana line. In that region, aided by his sons, Riley began the settlement of Willshire in Van Wert County, Ohio. Becoming a relatively well-known local figure, Riley served in the state legislature for the 1823-1824 session where he was acknowledged as an advocate for the improvement of his state and local community. Due to his experience in captivity, he became a staunch opponent of slavery.

The biggest contribution he may have made was when Riley wrote a book in 1817 about his trials and tribulations in the Sahara. History is strange with its twists and turns and the 16th President of the United States, Abraham Lincoln, said it was one of the three most influential books in his political development and in his fight for abolition. (The other two were the Bible and The Pilgrim's Progress).

The main point about Riley and the members of his crew is that when faced with an extremely difficult and trying situation they made the simple but astute decision to do one thing and that was to do whatever it took to survive. Whatever the odds of their actions succeeding, they were quite rational in realizing that they had nothing to lose by trying to improve their situation and their chances of continuing to live and enjoy life again. You can do the same by joining up with cryonics today. You'll be glad you did!

Reasons to Join ACS

1) We have been in business a long time

We were incorporated in 1969; our first cryopreservations were in 1974. We are a Calilfornia nonprofit corporation formed to advance research into cryonics and cryobiology. Two well-known medical doctors, Dr. M. Coleman Harris and Dr. Grace Talbot, were among our founders that also included Jerry White and Edgar Swank. Jerry and Edgar are in cryopreservation at the CI facility.

2) We work closely with the Cryonics Institute (CI)

Starting with our first frozen patients, ACS has maintained funds to keep these patients frozen. This responsibility has required that we focus on a practical approach to managing our resources. By working closely with CI with its ever-increasing "patient load" we are able to keep long-term storage costs down while adding to the funds of both ACS and CI.

3) Initial Preparation by Suspended Animation, Inc and other Options

We don't have all the answers. Cryonics depends upon anticipating future technological developments, and taking action NOW to benefit from those breakthroughs. This means there is a speculative aspect to cryonics. We give our members a wide a choice of options which include initial preparation by Suspended Animation, Inc. We also offer less expensive options. See our website for all choices.

4) ACS Utilizes the Tools of Risk Management

The ACS program employs the tools and techniques of risk management, such as inspection and verification of good practices at facilities where ACS members are in cryostasis.

Financial planning includes diversification and decentralization to help guard against adverse financial consequences for ACS assets.

5) ACS Sponsors Research

Some research programs of the American Cryonics Society have been very well publicized. The successful cool-down and recovery of Miles the Beagle led to appearances of ACS scientists on Good Morning America, The Sally Jessy Raphael Show, and The Phil Donahue Show.

6) ACS Maintains its Own Emergency Response

Long-term storage should be centralized but stand-by and emergency response, by its very nature, is local. In that regard we maintain emergency response equipment and responders in the San Francisco Bay Area that can also can be deployed to most locations in the US.

7) ACS is a Democratic Society

One internal control, absent in some organizations, is the fact that ACS is a democratic organization. That is, our governors are elected from among the members, by the members. A number of procedures have evolved over the years, to help ensure that this electoral procedure is safeguarded.

8) ACS Patients Have Live-Member Sponsors

To ensure that the obligation ACS has to people in suspension continue to be considered, ACS

has a program whereby live members act as "Sponsors" on behalf of the people in suspension. Sponsors get reports of suspension facilities housing the patient, and information on investments used to benefit the continued suspension of that person. Whenever possible, a good friend or relative of the person in suspension is named as a Sponsor. We prefer that the Sponsor also be enrolled in our suspension program.

9) ACS Manages Growth

The strength of a cryonics society is not dependent upon how many people it has in suspension. There must be a reasonable allocation of resources to meet the obligation of those in suspension. Societies who accept underfunded or non-funded patients must then make up that deficit through raising membership dues or by receipt of an endowment. Both of these fund raising methods involve significant risk, with results considerably in doubt.

The American Cryonics Society is not a kingdom built on a house of cards. The balance between those enrolled in our pre-need suspension plan, those in suspension, and the allocation of resources between these two programs is balanced to ensure our survival and prosperity. We are not dependent upon luck, endowments, windfalls, or even growth to sustain us.

10) We Make Use Of Individual Trusts

While other societies have more recently begun using trusts, the American Cryonics Society adopted this technique as its primary recommended funding vehicle in 1982. The individual trust is a mechanism to isolate and manage risk, ensure some oversight, obtain acceptable tax treatment, and address various problems and requirements unique to each individual member.

11) "Freeze-Wait-Reanimate" is our Only Purpose

The American Cryonics Society is not a "Utopian" organization. We don't have a political agenda to transform our current political or social structure to make our version of a perfect world. That is far too ambitious an undertaking; and besides, we don't all agree on what political and social changes are desirable. We are a cryonics society: PERIOD. Our program is simple: freeze-wait-reanimate. We support cryonics research, education, and information dissemination. That is what ACS is about. That is *ALL* ACS is about.

Mail: American Cryonics Society - P.O. Box 1509, Cupertino, CA 95015

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The ACS office is located at 355 W. Olive, STE 210, Sunnyvale, CA 94086. Office hours are irregular and an appointment is required for a personal visit or for an interview.

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An easy way to do so is just to contact us by mail or email and let us know. Our mailing address is: Immortalist Society, 24355 Sorrentino Court, Clinton Township MI 48035. You can also reach us by email at immsoc@aol.com.

Associate Membership

$25 per year in the United States, and includes an annual subscription to the Immortalist Society's magazine ***LONG LIFE: Longevity through Technology***. Please note that Subscriptions/ Associate Memberships in Canada & Mexico are $30; Europe air mail, $52; Australia or Asia, $62.

Full membership

$75 per year, which includes an air mail subscription to ***LONG LIFE*** anywhere in the world. Full members are eligible to vote in the society and stand for office. Please send in your membership application by mail with check or money order enclosed to Immortalist Society, 24355 Sorrentino Court, Clinton Township MI 48035 USA (payable to Immortalist Society). We also accept credit cards (VISA, MasterCard and American Express) by phone or via PayPal. If you wish to pay with credit card by phone, please call (586) 791-5961. If you'd like to pay through PayPal, please visit www.paypal.com for more information. When making payments to the Immortalist Society via Paypal, the address to pay to is immsoc@aol.com.

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